Dextra Asia Co Ltd and Another v Mariwu Industrial Co (S) Pte Ltd and Another Suit [2006] SGHC 7

Case Number : Suit 641/2004, 339/2005

Decision Date : 27 January 2006

Tribunal/Court : High Court

Coram : Tan Lee Meng J

Counsel Name(s) : Daniel Lim and Cindy Quek (Shook Lin and Bok) for the plaintiffs; Wong Siew Hong and Kalaiselvi Singaram (Infinitus Law Corporation) for the defendant

Parties : Dextra Asia Co Ltd; Dextra Manufacturing Co Ltd — Mariwu Industrial Co (S) Pte Ltd

Patents and Inventions – Inventive step – Alleged infringement of patent for manufacturing process consisting of combination of known elements – Whether patent invalid for lack of inventiveness – Section 13(1) Patents Act (Cap 221, 2005 Rev Ed)

Patents and Inventions – Novelty – Alleged infringement of patent for manufacturing process consisting of combination of known elements – Whether process not new or novel due to prior use, prior disclosure to other parties and prior art – Sections 13(1), 14(1), 14(2) Patents Act (Cap 221, 2005 Rev Ed)

27 January 2006 *Judgment reserved.*

Tan Lee Meng J:

1 Suit No 641 of 2004 ("Suit 641/2004") and Suit No 339 of 2005 ("Suit 339/2005") concern an alleged infringement of Singapore patent No 21011 (Application No 9490240-0) ("the patent"). In Suit 641/2004, the first plaintiff, Dextra Asia Co Ltd, the present owners of the patent, and the second plaintiff, Dextra Manufacturing Co Ltd, the exclusive licensees of the patent in Singapore (collectively, and together with all other companies in the Dextra group, referred to as "Dextra"), claimed that the defendant, Mariwu Industrial Co (S) Pte Ltd ("Mariwu"), infringed the patent. Dextra sought an injunction against any further infringement of the patent by Mariwu as well as damages. In the second suit, Suit 339/2005, Dextra alleged that Mr Tan Tiong Hwa ("Mr Tan"), the managing director of Mariwu, is jointly responsible for Mariwu's infringement of the patent. The defendants responded with a counterclaim for groundless threat of infringement and for the revocation of the patent on the ground that it is invalid for lack of novelty and inventiveness.

2 By an Order of Court dated 9 June 2005, both suits were consolidated. At the outset, two points ought to be noted. First, during the trial, leave was granted to Dextra to discontinue Suit 339/2005 against Mr Tan. As such, this suit need not be considered any further in this judgment. Secondly, Mariwu accepted that its system is technically identical to the process and product claims in the patent. This means that if the patent is valid, it will be guilty of infringement.

Background

3 The history of the patent is as follows. On 3 February 1988 (the "priority date"), Techniport SA ("Techniport"), a French company, filed an application for a European patent entitled "Method of making mechanical bar joints, bar joints making possible the method, and mechanical bar joints made by the same". The process protected by this European patent (the "Bartec process") was invented by Mr Alain Bernard, Techniport's founder and chief executive officer.

4 Techniport's European patent concerns a process for producing mechanical connections for joining reinforcement bars ("rebars"), which are required in modern construction. This is because concrete, which is very hard and strong, becomes brittle and may crack if it is a large mass. Hence, the need for rebars, which form what may be described as an "internal skeleton" for a concrete mass. As there is a limit to the length of rebars, they may have to be connected. The dispute between the parties reached the courts because the parties could not agree on whether the Bartec process for making mechanical connections is a novel and inventive way of overcoming existing shortcomings in the use of rebars in the construction industry.

5 Central to the Bartec process is the cold forging of rebars, which is in stark contrast to the then existing practice of hot forging rebars. The essence of the new system is the building of a parallel thread on a cold-forged-end of a reinforcing bar. They are then spliced together by means of a mechanical coupler. According to the manufacturer, this process "has proven itself to be the perfect splice for the construction industry".

6 The European patent that was granted to Techniport was registered in the UK on 6 December 1988. Subsequently, it was registered in Singapore in July 1994 under the Registration of United Kingdom Patents Act (Cap 271, 1985 Rev Ed), which has since been repealed.

7 A few months before the priority date, Techniport discussed the commercial exploitation of its new process with an English company, CCL Systems Limited, (known collectively with its subsidiaries, and after its acquisition by Ancon Clark Ltd, as "CCL"). Two days before the priority date, Techniport granted CCL a worldwide exclusive licence for the Bartec process with the exception of Hong Kong and Thailand ("the Techniport-CCL licence"). The exceptions were required because Techniport was working closely with Dextra in Hong Kong and with another company in Thailand.

8 In due course, Dextra was interested in the Singapore market. In May 1992, it entered into a joint venture agreement with CCL with respect to the introduction and exploitation of Bartec products in Singapore.

9 In 1993, Techniport sold its patents around the world with respect to the Bartec process to Establissements A Mure ("Mure"). In January 1994, the Techinport-CCL licence was novated by Techniport to Mure.

10 In 1995, the Techniport-CCL licence agreement was terminated. Despite the termination, CCL continued to market Bartec products and this led to costly legal battles across Europe between CCL and Mure before a truce was called. Under a memorandum of understanding, CCL became an exclusive licensee of the Bartec process in the UK and in Australia and agreed not to take any step to invalidate the European patent with respect to this process.

11 In 1995, Dextra sold its Singapore business to CCL and executed a non-competition agreement to stay out of the Singapore market for five years until 2000. After Dextra's exit from the Singapore market, CCL continued to sell Bartec products in Singapore.

12 On 31 December 1998, Dextra acquired the patent for the Bartec process in Asia from Mure.

13 In 1999, CCL appointed Easteel Construction Services Pte Ltd ("Easteel"), a subsidiary of NatSteel Asia Pte Ltd, as its licensee for Bartec products in Singapore. In July 1999, Dextra wrote to CCL, stating that it had acquired the Bartec patent in Asia. Dextra invited CCL to be its licensee but despite negotiations over the years, no agreement was reached.

14 In February 2000, Dextra informed Easteel that it owned the Bartec patent in Asia and that the latter was infringing the patent. Mariwu's managing director, Mr Tan, was then Easteel's sales manager.

15 In April 2002, Dextra re-entered the Singapore market and appointed Sintec System Pte Ltd as its distributor. Although it markets the system covered by the patent elsewhere under the name "Bartec", it did not do so in Singapore because the word "Bartec" is, strangely enough, a Singapore-registered trade mark belonging to CCL. All the same, for convenience, the term "Bartec" will be used in the rest of this judgment to refer to the process and products protected by the patent, whether in Singapore or elsewhere.

16 In July 2002, Easteel ceased to be CCL's distributor of Bartec products. CCL then offered the distributorship to Mr Tan, who accepted it and set up Mariwu for this purpose. In September 2002, Mr Tan left Easteel for Mariwu.

17 On 6 June 2003, Dextra invited Mariwu to be its licensee but nothing came out of this. On 18 November 2003, Dextra terminated Sintec's licence and in May 2004, it appointed Easteel as its exclusive licensee. In its agreement with Easteel, Dextra undertook to take legal action against Mariwu and other infringers of the patent. Dextra then sued Mariwu and Mr Tan.

Whether or not the patent is valid

18 A patent is a limited monopoly granted to a patentee for 20 years. Dubbed a "Faustian pact" (see Lionel Bentley & Brad Sherman*, Intellectual Property Law* (Oxford University Press, 2nd Ed, 2004) at p 323, the limited monopoly has been justified on the ground that it acts as an incentive to patentees to disclose information that may otherwise have remained secret. Of course, the registration of a patent is only the first hurdle for a patentee because an invention may be revoked on the ground that it is not a patentable invention.

19 What may be patented is stated in s 13(1) of the Patents Act (Cap 221, 2005 Rev Ed) ("the Patents Act") provides as follows:

> Subject to subsection (2), a patentable invention is one that satisfies the following conditions:
>
> (*a*) the invention is new;
>
> (*b*) it involves an inventive step; and
>
> (*c*) it is capable of industrial application.

20 Although Mariwu pleaded a number of defences, it decided during the trial to rely solely on its assertion that the patent is invalid because it is not new or novel and it does not involve an inventive step.

Whether the Bartec patent is novel

21 Section 14(1) of the Patents Act provides that an invention is new "if it does not form part of the state of the art". Section 14(2) explains the term "state of the art" as follows:

> The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the

priority date of that invention been made available to the public (whether in Singapore or elsewhere) by written or oral description, by use or in any other way.

22 Mariwu asserted that the patent is not new or novel because of prior use, prior disclosure to other parties and prior art.

Prior use

23 Mariwu claimed that the process protected by the patent was used before the priority date in Hong Kong in the Pacific Place project and in France in the Lille Metro and the Ile de Ré bridge projects.

24 In para 23 of its Opening Statement, Mariwu stated that evidence of prior use would be furnished by two of CCL's directors at the material time, namely, Mr Brian Rhodes, and Mr Michael Appleton. However, both Mr Rhodes and Mr Appleton candidly admitted during cross-examination that they had no personal knowledge of the Hong Kong and French projects in question. Another Mariwu witness, Mr Melvyn Precious, who was CCL's sales manager at the material time, also admitted that he was not a witness of events at the Pacific Place project and that he had never been to the Ile de Ré.

25 Virtually no details of the two French projects were furnished. Mariwu asserted that it appears from Techniport's brochures and Mure's website that the Bartec process was used before the priority date. No one verified what was stated in the brochures or website and it cannot be assumed that everything stated therein is correct. Brochures and websites are not always accurate and may contain puffs.

26 Mariwu's entire case on prior use of the Bartec process in France is based on hearsay. The following part of the proceedings relating to the cross-examination of Mariwu's managing director, Mr Tan, confirms this:

> Q. Can you see that this Metro project is from … 1984 all the way to … November 2000. So there are many different phases for this project?
>
> A. Yes.
>
> Q. Do you agree that [you] have no evidence of which part of this project Techniport was involved in?
>
> A. Yes.
>
> …
>
> Q. You in fact do not have any witness who witnessed these projects in France, correct?
>
> A. It's based on what Mr Alain Bernard told our witnesses.

27 What Mr Bernard told Mariwu's witnesses is, without more, hearsay. Besides, CCL's former director, Mr Brian Rhodes ("Mr Rhodes"), conceded during cross-examination that Mr Bernard could have exaggerated matters for business purposes. The following questions and answers confirm this:

> Q. Do you agree that you make some things up to keep Mr Bernard interested?

A. Yes …

…

Q. Now, do you agree that Mr Bernard could equally have been doing the same thing, telling you things to keep you interested.

A. Yes, I think so. *Yes, yes, without a doubt.*

[emphasis added]

28 Admittedly, some photographs of the Ile de Ré bridge in a brochure were produced for the first time at the trial but the photographs of the said bridge indicate that a hot forged system rather than the cold forged system claimed in the patent may have been used in this project. With no concrete evidence either way, it must be taken that the allegation that the Bartec process was used in this bridge project was not proven.

29 As for the Hong Kong project, there was also no concrete evidence of prior use before the priority date even though Mariwu took pains to stress that Techniport flew equipment to Hong Kong in the spring of 1987 and that the Bartec products were submitted for testing in a bid to obtain approval from the Hong Kong authorities for use in the Pacific Place project. Dextra pointed out that while the Pacific Place project started before the priority date, its subcontract with the main contractor, Dragages, for the use of the Bartec products was dated 31 January 1989, which is almost a year after the priority date. It added that the research and development that took place in Hong Kong was under a cloak of confidentiality.

30 Mariwu relied on the reports by one Mr Norman Martel to CCL on the Pacific Place project. Mr Martel did not give evidence and what he stated in his reports to CCL was what he had heard from another person, Mr Jack Quibel. Mr Rhodes, CCL's former director, conceded during cross-examination that the latter's reports were based on hearsay. The relevant part of the proceedings is as follows:

Q. [Norman Martel] was communicating to you information that was told to him, so it was hearsay, would you agree?

A. … I certainly believe that that was the case, yes.

…

Q. [As for his] second and follow-up report – …

…

A. Yes, it's a hearsay, it's a follow-up to; that was what Jack Quibel had said to him.

31 Mariwu produced a video in court that was supposed to show the use of the Bartec process in Hong Kong before the priority date. However, as it turned out, and much to Mariwu's surprise, this was not the case. The following part of the proceedings during the cross-examination of Mariwu's Mr Raymond Tan merits attention:

Q. At 5 minute and 14 seconds of this video, … Do you see a date stamp, yes or no?

A. Yes.

Q. The date stamp reads "14-4-1988", correct?

A. Correct.

Q. This is after the priority date of the patent, correct?

A. Yes, that is what is here.

32 It follows that Mariwu's case on prior use in Hong Kong was also not established.

33 At this juncture, it ought to be noted that whatever Mariwu may have asserted about prior use, it admitted that there is no prior use in relation to claims 4 and 5, which concern mechanical compression (claim 4) of a specified force (claim 5) by proof loading machines. When cross-examined, Mariwu's managing director, Mr Tan, stated as follows:

Q. … There is no evidence that claims 4 and 5 were practised either in Hong Kong or in France in whatever circumstance. Even if we accept your best case on prior use, claims 4 and 5 are valid and infringed, leaving aside anything that is in prior art documents … Do you accept that?

A. Accept.

34 In any case, CCL's former director, Mr Michael Appleton, confirmed that that the proof loading machines required for the mechanical compression referred to in claims 4 and 5 were developed with CCL's assistance and there can be no doubt that these machines were created after the priority date. Dextra pointed out that as long as some of the process claims are valid, a patent will be partially valid. This line of argument need not be further considered because Mariwu's allegation regarding prior use in France and Hong Kong was not proven.

Prior disclosure

35 Mariwu's reliance on prior disclosure of the Bartec process before the priority date will next be considered. As has been mentioned, a few months before the priority date, Techniport was involved in negotiations with CCL to commercially exploit its invention. Mariwu considered this as a prior disclosure that invalidates the patent.

36 Dextra submitted that as the disclosures were made in a confidential setting, the patent was not invalidated. In *Hunter Manufacturing Pte Ltd v Soundtex Switchgear& Engineering Pte Ltd (No 1)* [2000] 1 SLR 401, which concerned the infringement of a registered design, the question of prior disclosure arose because the product, an electrical meter box, had been sold to a third party who subsequently became the sole distributor of the boxes. L P Thean JA, who delivered the judgment of the Court of Appeal, pointed out that the owner of the registered design and the sole distributor collaborated on the conceptualisation of the design and market research and it was contemplated that the latter would be the former's sole agent. He said that both the elements of interest in the design and private collaboration were present and it could not be said that the registered design had become a matter of public knowledge so as to amount to a public disclosure.

37 In the present case, both CCL and Dextra had discussions with Techniport with a view to improving and perfecting the invention for mutual profit. CCL was rather insistent at the material time that there should be a shroud of secrecy with respect to its discussions with Techniport and was

rather anxious that Techniport should patent its new process as soon as possible. Indeed, the mechanical compression required for the products was done by a machine designed by CCL after the priority date. In his report on his visit to Techniport's office, CCL's then director, Mr Rhodes, stated in para 2 as follows:

> Alain Bernard is very amenable to an arrangement with CCL. He regards himself as a small organisation unable to support a world-wide business. He regards CCL as well-established internationally, especially in countries of British cultural dominance.
>
> We discussed around proposals for a seven-year licence for CCL to exploit the technique internationally – 5% on sales providing there is adequate patent cover.

38 It is common ground that CCL coined the name "Bartec" for Techinport's process and products. Mr Rhodes admitted during cross-examination that he was so impressed with what he saw that he rushed out a draft licence agreement to Techniport which gave CCL an exclusive licence to use the technical information, patents, methods and equipment and to sell and manufacture equipment in accordance with the Bartec process. It is noteworthy that cl 5(g) of the draft agreement contained the following confidentiality clause:

> To keep secret and confidential all technical information and not at any time disclose this information to a third party, except on a "need to know" basis.

39 When cross-examined, Mr Rhodes accepted that confidentiality was very important to both parties. The relevant part of the proceedings is as follows:

> Q. You were concerned and interested in keeping all the technical information confidential, correct?
>
> A. Yes, except … to Techniport and ourselves of course.
>
> …
>
> Q. Would you agree with me that basically this means that whomever CCL does disclose the information to, that person would also be asked to keep the technical information secret?
>
> A. Yes, I suppose so.

40 Apart from Mr Rhodes, two other CCL personnel visited Techniport's office. The first, Mr Michael Appleton, stated that he saw Techniport's cold forging machine and discussed details of the new process with Techinport's personnel. However, it is pertinent to note that by the time he visited Techniport's office, Mr Rhodes had already despatched the proposed licence agreement, which contained a confidentiality clause, to Techniport. Furthermore, Mr Appleton stated in para 7 of his Affidavit of Evidence-in-Chief ("AEIC") that CCL was "keen to forge an alliance with Techniport" and his visit must be viewed in the context of this objective. As for the visit to Techniport's office by CCL's then sales manager, Mr Melvyn Precious, who testified that Techniport was "very open" about its products, it must be pointed out that by the time of his visit, the licence agreement between Techniport and CCL had already been signed. In any case, the priority date is 3 February 1988.

41 As for disclosures by Techniport to Dextra, Dr Jean Marie Pierre Michel Pithon ("Dr Pithon"), the first plaintiff's chief executive officer, stated that the matters that were disclosed were confidential matters not to be disclosed to other persons. Paragraph 33 of his AEIC reads as follows:

> The discussions with Techniport were kept confidential. Mr Bernard's ideas for the invention still required further research and development … and Dextra Pacific participated in the R & D, always keeping matters confidential.

42 I agree that the evidence pointed inexorably to a finding that all disclosures before the priority date were cloaked with confidentiality and provided no basis for Mariwu's assertion that prior disclosure invalidated the patent.

Prior art

43 Mariwu's assertion that the Bartec patent was invalidated by prior art will next be considered. The state of the art on the priority date has much to do with the validity of a patent. In *The General Tire & Rubber Company v The Firestone Tyre and Rubber Company Limited* [1972] RPC 457 at 485–486, Sachs LJ explained:

> If the prior inventor's publication contains a clear description of, or clear instructions to do or make, something that would infringe the patentee's claim if carried out after the grant of the patentee's patent, the patentee's claim will have been shown to lack the necessary novelty, that is to say, it will have been anticipated. …
>
> To anticipate the patentee's claim the prior publication must contain clear and unmistakeable directions to do what the patentee claims to have invented … A signpost, however clear, upon the road to the patentee's invention will not suffice. The prior inventor must be clearly shown to have planted his flag at the precise destination before the patentee.

44 Sach LJ's view was endorsed by the Court of Appeal in *Merck & Co Inc v Pharmaforte Singapore Pte Ltd* [2000] 3 SLR 717.

45 At this juncture, the claims under the patent ought to be referred to. Each claim represents an independent invention. Mariwu focused on the process claims, namely claims 1–5. Claim 1 details the following:

(a) the ends of two rebars to be enlarged by cold upsetting;

(b) then rethreaded;

(c) the thread bottom diameter is equal to or greater than the original diameter of the rebar; and

(d) the rebars are joined by a sleeve-coupler.

46 Claim 2 involves the elements of claim 1 with the addition that the enlarging is over the length of the threaded portion.

47 Claim 3 involves the elements of claim 1 with the addition that the enlargement is equal to or less than 30%.

48 Claim 4 relates to claims 1, 2 and 3 and adds that the threaded ends are subject to mechanical compression.

49 Claim 5 elaborates on claim 4 by stating that the mechanical compression is of a specified

force, namely with an equivalent force of between 70% and 95% of the elastic limit of the concrete reinforcing rod.

50 Dextra's expert, Prof Fan Sau Cheong ("Prof Fan") of the School of Civil & Environmental Engineering, Nanyang Technological University, explained the significance of claims 3, 4 and 5 in the following terms:

> The enlargement of no more than 30% is also important. Prior to the invention, the tradition was to enlarge by more than 30%. The limit of 30% overcame the problems caused by cold forging a rebar, yet achieved the required strength in order to make the invention work.
>
> The proof-testing, or mechanical compression step is also important as it ensures quality control to achieve a 100% result.

51 Mariwu identified a number of documents that allegedly reveal that the patent is not novel. The main ones are as follows:

(a) the Lancelot patent (the "Canadian patent"), which was filed in the US and Canada;

(b) the German building standard dated December 1978, which is referred to as "DIN 1045";

(c) an extract from a German/Chinese textbook published in 1977; and

(d) an article from a magazine, *Concrete Construction*, which was published in 1985.

52 When examining publications in relation to the issue of novelty, the following words of Tomlin J in *In the matter of Lowndes' Patent* (1928) 45 RPC 48 at 57, are instructive:

> [I]t is not open to you to take a packet of prior documents and, … by … putting a puzzle together, produce what you say is a disclosure in the nature of a combination of the various elements which have been contained in the prior documents. I think it is necessary to point to a clear and specific disclosure of something which can be fairly stated to be the invention of the patentee …

53 Mariwu's expert witness, Assoc Prof Chew Chye Heng ("Assoc Prof Chew") of the Department of Mechanical Engineering, National University of Singapore, was rather unhelpful on the issue of prior art. To begin with, he admitted that he was ignorant of the law on the assessment of prior art for novelty. When Dextra's counsel, Mr Daniel Lim, tried to enlighten him on some of the applicable rules, he steadfastly refused to follow the rule against making a mosaic out of the articles he had read. The relevant part of the proceedings is as follows:

> Q. [W]hen you look at prior art and you assess novelty, you look at the prior art documents singly.
>
> A. … [E]ngineering covers such a broad area that no single area will cover everything…
>
> Q. [Y[ou are saying you did not … and you do not wish to adopt that approach, correct?
>
> A. Yes…

54 Even if Assoc Prof Chew's refusal to refrain from making a mosaic of the articles he had read and his failure to distinguish between a sign post and a flag are ignored, his evidence did not advance

Mariwu's case in any way. One important feature of the Bartec process is cold forging, which was described by Dr Pithon as the "most novel and innovative part of the patent". Assoc Prof Chew assumed that cold forging was not new or inventive because others who had patented processes before had used the term "forging", which could mean either hot or cold forging. However, his evidence was confusing. Initially, he stated as follows:

> Forging is common engineering work. When forging is used, *it always imply hot or cold* and when you say forging, cold or hot, depends on material property. So you cannot use the word forging alone because it makes no sense… [emphasis added]

55 A few minutes later, he testified as follows:

> [F]orging depends on material property. So *forging itself does not imply whether hot or cold.* It depends on material property… [emphasis added]

56 Assoc Prof Chew also claimed that the cold forging of rods to enlarge the ends was well documented before 1988 and that the German guidelines contained in DIN 1045 provided guidelines on how to proceed on cold forging of the rods to enlarge the ends. After he was robustly challenged by the plaintiffs' counsel, Mr Daniel Lim, he withdrew his assertion that DIN 1045 provided the stated guidelines.

57 Assoc Prof Chew's evidence on the Canadian patent, which he accepted was the prior art closest to the Bartec patent left much to be desired for other reasons. His assertion that Techniport's use of cold forging to produce its rebars was not novel because the reference in the Canadian patent to forging pointed to either hot or cold forging is also absolutely untenable because the inventor of the process protected by the Canadian patent described his patent as one that involved hot forging. He next undermined his assertion that the Canadian patent anticipated the Bartec patent and invalidated it when he said as follows during cross-examination:

> Q. Do you agree … that the Canadian patent teaches you not to use a sleeve coupler?
>
> …
>
> A. Yes.
>
> Q. Do you agree … that ... the Canadian patent, does not teach you to enlarge by no more than 30%? Agree or disagree?
>
> A. Agreed…
>
> Q. Do you agree … that the ... Canadian patent, does not teach you mechanical compression?
>
> A. Yes…
>
> Q. *So very clearly, the [Canadian] patent doesn't have the combinations of our invention?*
>
> A. Yes…
>
> [emphasis added]

58 Assoc Prof Chew totally undermined his case when he testified that if the patent is valid, the

use in Singapore of the process in the Canadian patent would not infringe it because of differences between the patent and the Canadian patent. He failed to appreciate that if the processes in the Canadian patent and Singapore patent are as different as he claims, his assertion that the process in the Canadian patent anticipated the patent has no leg to stand on.

59 Dextra's expert witness, Prof Fan, clearly explained why the patent did not lack novelty. He testified that hot forging of rebars was the norm at the material time and that it was difficult to maintain stringent quality with cold forging until the Bartec process was invented. In para 126 of his AEIC, he pointed out that there is no possible combination in any of the prior art that could come up with claims 3–5 of the Patent. As for the Canadian patent, he stated at para 127 of his AEIC as follows:

> I note that the [inventor] is a skilled and inventive person having already invented [the Canadian patent]. If the [Bartec] Patent is so obvious, or any combinations of teaching in the article were obvious, why did the author not arrive at the invention in the Patent. It is clear that the article states that there is a felt need to arrive at a better solution that meets with the stringent industry standards. The author had from 1985 to 3 February 1988 failed to come up with the invention in the Patent. Indeed, in 1992 in [a subsequent patent], the author appears to have repented of his discouraging the use of a sleeve coupler by 'improving' on [his earlier patent] with a system that did use a sleeve-coupler.

60 As the Canadian patent, which was regarded by Assoc Prof Chew as the closest prior art, did not come even close to anticipating the Bartec patent, there is really no need to consider the other documents relied on by Mariwu as evidence of prior art. This is especially so since Assoc Prof Chew made major concessions regarding what the other prior art cited by Mariwu did not teach. The relevant part of the proceedings is as follows:

> Q. Do you agree that there is no prior art that clearly and unmistakably teaches the enlarging of the concrete rebar by no more than 30%?
>
> …
>
> A. Yes, I agree …
>
> Q. Do you agree that there is no prior art that clearly and unmistakably teaches that the end of the rebar that is enlarged and threaded is subject to mechanical compression?
>
> …
>
> A. I agree…

61 I thus find that the patent is not invalidated by lack of novelty.

Whether the Bartec patent is inventive

62 Whether the patent is invalid because it lacked inventiveness will next be considered. Section 15 of the Patents Act provides that an invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art. In *Molnlycke AB v Procter & Gamble Limited* [1994] RPC 49 at 112–113, Sir Donald Nicholls VC explained:

> [T]he criterion for deciding whether or not the claimed invention involves an inventive step is

wholly objective. It is an objective criterion defined in statutory terms, that is to say whether the step was obvious to a person skilled in the art having regard to any matter which forms part of the state of the art ….

The Act requires the court to make a finding of fact as to what was, at the priority date, included in the state of the art and then to find again as a fact whether, having regard to that state of the art, the alleged inventive step would be obvious to a person skilled in the art.

63 Inventiveness requires a "spark of imagination". In *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59 at 73–74, Oliver LJ explained:

There are, we think, four steps which require to be taken … The first is to identify the inventive concept embodied in the patent in suit. Thereafter, the court has to assume the mantle of the normally skilled but unimaginative addressee in the art at the priority date and to impute to him what was, at that date, common general knowledge in the art in question. The third step is to identity what, if any, differences exist between the matter cited as being "known or used" and the alleged invention. Finally, the court has to ask itself whether, viewed without any knowledge of the alleged invention, those differences constitute steps which would have been obvious to the skilled man or whether they require any degree of invention.

64 Mariwu's position is that the Bartec process is, at the very most, a new use for an old system. In his Closing Submissions, Mariwu's counsel, Mr Wong Siew Hoong, stated that "the only advantage between cold forging and hot forging is that Techniport did not have to use a furnace in order to hot forge the rebars". If this is true, CCL's then director, Mr Rhodes, would not have referred to the Bartec process as a "unique" method of joining reinforcing bars in para 5 of his AEIC. CCL's other director, Mr Michael Appleton, was honest enough to testify that the Bartec process was "exciting". The relevant part of the proceedings is as follows:

Q. Why was it exciting?

A. Well, it may not sound very exciting to you, but if you were in that business and being aware that we've lost this huge job in Hong Kong to Techniport, to have the chance to work with them with this new system which seemed to be much more competitive to our own, was exciting.

65 Mariwu also emphasised that the invention involved a combination of known integers. However, in *British Celanese,Ld v Courtaulds,Ld* (1935) 52 RPC 171 at 193, Lord Tomlin explained:

It is accepted as sound law that the mere placing side by side of old integers so that each performs its own proper function independently of any of the others is not a patentable combination, but *where the old integers when placed together have some working inter-relation producing a new or improved result then there is patentable subject-matter in the idea of the working inter-relation brought about by the collation of the integers.* [emphasis added]

66 Dextra's expert, Prof Fan, had no doubt that inventiveness was required to select the particular elements and to combine them in a particular process that would work so well together. In paras 177–182 of his report, Prof Fan explains why cold forging of the Bartec products is inventive:

177. Cold forging is known to cause local weaknesses in the material. One can get the shape, but one cannot be certain of the quality. It is easy to see this when we look at plastic or a paper clip. If you try to bend it cold, or change its shape, it cracks. Even if there are micro-cracks, weakness in the material is created. In hot forging, the material is malleable and it is easier to

ensure uniform quality because there is a more even treatment of the material. There is a reduction of local damage.

178. A certain standard and quality is required in the connection of rebars. … Since it is known that cold forging would reduce ductility and hence increase local weakness, it is not favourable to cold forge a rebar.

179. Cold forging increases the brittleness of the rebar. Brittleness is not desirable in rebars as a matter of safety since it reduces pre-warning.

180. It is therefore not possible to overcome the weaknesses and disadvantages of cold forging until the technology had advanced to a certain stage.

181. Accordingly, cold forging is not an obvious technique to use in relation to enlarging rebars (especially since they have already undergone one set of cold forging treatment). Problems and obstacles are known.

182. It is therefore clear that the cold forging element is an important and inventive aspect of the invention in the Patent.

67 In paras 237–241 of his report, Prof Fan shed further light on the obstacles faced by cold forging and how the inventive concept of the patent manages to avoid the drawbacks of the then existing practice when he explained as follows:

237. Looking at the state of the art at the relevant time, it is apparent that there were many limitations and shortcomings of the then-existing technology… There are splicing techniques available at the time but in order to overcome the difficulties of the then-existing technology and to also achieve the acceptable standard for the construction industry required something inventive.

238. This is where things like the root diameter come in and hot versus cold forging, in order to make sure the strength of the system is not lessened. At that time, prior to 3 February 1988, enlarging is traditionally more than 30%.

239. At that time, it was harder to control cold forging, the process was not precise such that the tightness of fit of the connection could not be achieved.

240. Hence, there were many drawbacks in the existing practice at the time.

68 In contrast to Prof Fan's evidence, Assoc Prof Chew's evidence on the issue of inventiveness was, like his evidence on novelty, not helpful at all. He offered no concrete reason either in his AEIC and report or during the trial for his conclusion that no inventive concept had been patented. In any case, Assoc Prof Chew had a flawed understanding of the meaning of "inventive". He insisted that for inventiveness, there must be a significant advance. This is incorrect for in *Peng Lian Trading Co v Contour Optik Inc* [2003] 2 SLR 560 at [28], Chao Hick Tin JA reiterated that a small step or a very slight advance could still be an inventive step. He added that it "is all to easy to say, after the event, that the thing was obvious and involved no invention" and that "[*e*]*x post facto* analysis can often be unfair to inventors". In similar vein, in *Vickers, Sons and Co, Limited v Siddell* (1890) 7 RPC 292 at 304–305, Lord Herschell made it clear that simplicity is not a bar to an invention being considered inventive when he said:

> If the apparatus be valuable by reason of its simplicity, there is a danger of being misled by that very simplicity into the belief that no invention was needed to produce it. But experience has shown that not a few inventions … have been of so simple a character that when once they were made known it was difficult … not to believe that they must have been obvious to everyone.

69 Dextra's counsel, Mr Lim, rightly pointed out that while the idea of using cold forging might be simple, "the new use involves practical difficulties that were overcome by some ingenuity" and it should not be overlooked that cold forging of concrete rebars had never been done prior to the invention in the patent and the result of this new process was a significant advance in the field of mechanical couplers for rebars.

70 It is clear that commercial success is also a factor to take into account when determining whether there is inventiveness. In *Samuel Parkes & Co Ld v Crocker Brothers Ld* (1929) 46 RPC 241 at 248, Tomlin J explained:

> [W]hen once it had been found, as I find here, that the problem had awaited solution for many years, and that the device is in fact novel and superior to what had gone before, and has been widely used, and indeed in preference to alternative devices, it is, I think, practically impossible to say that there is not present that scintilla of invention necessary to support the Patent.

71 With respect to commercial success, Dextra pointed out that since the invention in question, no other sleeve-coupler system has bettered the Bartec system and this explains its commercial success. In the last 17 years, it achieved $200m worth of sales. In para 257 of his AEIC, Dr Pithon explained how the Bartec system changed the status of his small company into one of three global players in this field as follows:

> The Plaintiffs were not a big company that took on another product to market. We started small and grew with the Bartec System. We were not an incumbent in the building and construction industry, we were a new player when we started. The Bartec System is so good, that it is good for business and the industry.

72 Mariwu has also enjoyed commercial success in marketing the Bartec products. It disclosed that between December 2002 to December 2004, it sold $2.5m worth of these products. Around 320,000 connections were sold during this two-year period.

73 After considering all the circumstances, I hold that the Bartec process was not obvious to a person skilled in the art. As such, it was not established that it lacked inventiveness.

Absence of Mr Alain Bernard

74 Before concluding, it ought to be noted that Mariwu criticised Dextra for failing to call Mr Alain Bernard, the founder of Techniport and inventor of the Bartec process, as a witness and invited the court to draw an adverse inference. Mariwu has the burden of proving prior use and in the face of the flimsiest of hearsay evidence on this issue, the fact that Mr Bernard was not called as a witness by Dextra need not be considered any further.

Conclusion

75 As I have found that the patent did not lack novelty or inventiveness, it is valid and an injunction is granted to restrain Mariwu from infringing the patent. Since Mariwu accepted that it is guilty of infringement if the patent is valid, there will be an inquiry as to the damages suffered by

Dextra as a result of the infringement. Such an assessment will be carried out by the Registrar.

76 Dextra is entitled to the costs of the action.