

CASE NOTE – PATENTS

Element Six Technologies Ltd v Ila Technologies Pte Ltd [2020] SGHC 26

Amica Law represented the successful Plaintiff, Element Six Technologies Ltd (“E6”) in one of Singapore’s largest patent infringement suits to date. In a 204-page judgment following four years of litigation, the High Court upheld the validity of E6’s patent relating to chemical vapour deposition (CVD) diamond material of certain optical properties, and found the patent infringed by samples of diamond material from the Defendant, Ila Technologies Pte Ltd (“Ila”), as well as Ila’s manufacturing process

Background

The Plaintiff, E6, is part of the De Beers Group, which is in turn a subsidiary of Anglo American PLC. E6 specialises in the production of synthetic diamond material using CVD techniques to produce synthetic diamonds for technical applications in various industries (e.g. optics, semiconductors, and sensors). CVD refers to a process by which diamonds are grown from a substrate (i.e. a diamond seed) placed in a CVD reactor containing a mixture of gases and bombarded with atoms.

The Defendant, Ila, is a major manufacturer of CVD diamond material with a diamond growing facility in Singapore for which it invested more than S\$200 million.

The patents in suit were two patents that E6 registered in Singapore, namely, Singapore Patent Nos. 115872 (“SG 872”) and 110508 (“SG 508”). E6’s case was that its patents had been infringed by three samples of diamond material from Ila (individually referred to as “Sample 2”, “Sample 3”, and “Sample 4”, and collectively referred to as the “Samples”), as well as by Ila’s process for growing diamond material.

Ila contended that E6’s patents were invalid and in any case, were not infringed by the Samples or its process.

Decision

SG 872 – Validity and Infringement

The High Court found SG 872 to be valid and infringed.

The key product claim of SG 872 is Claim 1, which covers CVD diamond material of certain characteristics, in particular, low optical birefringence within a certain range of values. Birefringence is an optical property used to determine a diamond’s suitability for high-end optical applications. The Court’s findings on the validity of Claim 1 can be summarised as follows:

- (a) Novelty. Claim 1 was held to be novel. The Court sided with E6 and found that CVD diamonds are a distinct type of diamond, thereby rejecting Ila’s argument that Claim 1 had been anticipated by natural

diamonds or diamonds made using high pressure, high temperature (HPHT) technology within the claimed birefringence range.

The Court also found that the mere disclosure of CVD diamonds described in the prior art as having “low birefringence”, without any quantitative measurement of birefringence, would not be sufficient to anticipate Claim 1.

- (b) Inventiveness. Claim 1 was held to be inventive. Preliminarily, the Court noted that Ila had adopted a wrong approach by contending that Claim 1 does not involve an inventive step simply because it was allegedly anticipated by the prior art; the novelty and obviousness inquiries ought not to be conflated. The Court ultimately found that the steps to be undertaken in order to obtain a CVD diamond within the claimed birefringence range would not have been obvious to a person skilled in the art (“PSA”).
- (c) Sufficiency. Claim 1 was held to sufficiently disclose the claimed invention. The Court found Ila’s arguments relating to alleged flaws with using the Metripol system to measure birefringence to be unmeritorious.

The key process claim of SG 872 is Claim 62, which comprises substrate preparation and the deliberate addition of 300ppb to 5ppm of nitrogen to the synthesis process. The High Court’s findings on the validity of Claim 62 can be summarised as follows:

- (a) Novelty. Claim 62 was held to be novel. In particular, the Court rejected Ila’s argument that there was anticipation as long as the prior art discloses a single value that falls within the claimed nitrogen range. The Court followed the English position that where the prior art discloses a range that overlaps with the range in the patent, the question to be asked is whether the prior art teaches the PSA to operate in the area of the combined overlap of the ranges. In the present case, the Court answered this question in the negative.
- (b) Inventiveness. Claim 62 was held to be inventive. In particular, the Court noted that, at the relevant time, nitrogen was viewed as an impurity or contaminant that ought to be reduced to the lowest practical levels possible. Claim 62 is inventive as, contrary to this consensus, it taught the controlled addition of a specific concentration of nitrogen in order to improve the optical properties of the resultant CVD diamond.
- (c) Sufficiency. Claim 62 was held to sufficiently disclose the claimed invention. The Court rejected Ila’s arguments relating to the quantitative relationship between the addition of nitrogen and the reduction of dislocation density or strain in the resultant CVD diamond, the calibration of other growth parameters to ensure that the level of nitrogen is consistently kept at the desired level, and the overlap of examples in certain patents.

Turning to the issue of infringement of SG 872, of particular note were Ila’s contentions in relation to the provenance and chain of custody of the Samples. As a general point, the Court noted that Ila always had the opportunity to inspect the Samples and adduce positive evidence to show that the Samples did not originate from it; instead, it chose to speculate on alleged holes in E6’s account of provenance and chain of custody, which reflected an incorrect understanding of the burden of proof. A summary of the Court’s findings on provenance and chain of custody is as follows:

- (a) *Provenance*. The Court held that all of the Samples, which were obtained via trap purchases, originated from Ila. Sample 2, which was purchased from a third party (referred to as MWE), was found to have originated from Ila, based on contemporaneous documents that showed its sale from Ila to that third party. In this regard, the Court rejected Ila's argument that in order to establish provenance, E6 must call witnesses with personal knowledge to testify; instead, the Court held that there is nothing preventing E6 from adducing other evidence, including documentary evidence, to establish provenance. In fact, the Court noted that in the present case, greater weight may be placed on contemporaneous documentary evidence, as opposed to witness testimony, since the Samples are not identifiable by naked eye inspection alone.

Sample 3 was also purchased from a third party (referred to as PGD); it was found to have originated from Ila based on the fact that (i) PGD and Ila were owned by the same company at all material times and (ii) Ila's CEO, who is the sole shareholder of PGD, was in a position to have PGD produce documents showing that Sample 3 was obtained from other sources, but did not do so.

As for Sample 4, the case was relatively straightforward, as it had been purchased directly from Ila.

- (b) *Chain of custody*. The Court held that there was an unbroken chain of custody, such that the Samples were the very samples tested for infringement. On the whole, the Court found that *"the defendant's contentions, to a large extent, were founded purely on the theoretical possibility of a break in the chain of custody"*.

The Court accepted E6's evidence on the *"fingerprints"* of the Samples, which involved a comparison of various images, weights, and dimensions taken of the Samples at various stages.

The Court also rejected Ila's argument that where there is doubt as to the identity of an exhibit, every single witness who handled the exhibit must be called to establish the chain of custody. The Court clarified that the case law relied on by Ila was in the criminal law context, where the burden is on the prosecution to prove, beyond a reasonable doubt, that there was an unbroken chain of custody; in the context of civil cases, an unbroken chain of custody need only be proved on a balance of probabilities. On the forgoing basis, the Court held that it was not necessary for E6 to call each and every individual involved in the chain of custody, including individuals from external third parties to which the Samples had been sent to for certain tests, to give evidence.

As for E6's evidence on its diamond traceability system, the Court found it to be a proper system designed to ensure the integrity of the Samples. Ila claimed that the daily checkout lists ("**DCLs**"), which record the check ins and check outs of diamond material to and from E6's storage facility, were fraught with inconsistencies and discrepancies. The Court, having reviewed the evidence, nonetheless found that these inconsistencies and discrepancies, which in any event only accounted for a small percentage of the total number of DCLs, could be explained by simple human error. The Court noted that since the DCLs were completed by a miscellany of scientists on a daily basis as a routine matter, it was not inconceivable for there to be human administrative errors; it was inappropriate for Ila to infer, merely from these errors, that there was tampering of evidence.

Having found Ila responsible for the Samples, the Court went on to find Claims 1 and 62 of SG 872 infringed. The Court noted generally that Ila could have conducted a physical examination of the Samples, of the various machines used, or of the tests conducted, or asked for repeat tests or experiments on the Samples.

However, Ila only relied on technical arguments. The Court found that Ila's decision not to conduct its own experiments or ask for repeat experiments had legal consequences. Firstly, save in exceptional circumstances, where a defendant does not ask for a repeat of the notice of experiments, the Court will accept that the steps described will produce the results alleged. Secondly, when determining the issue of infringement, the Court places weight on actual experiments conducted as they are "*inherently more transparent than a good deal of other evidence*". A summary of the Court's findings on the infringement of SG 872 is as follows:

- (a) Claim 1. The Court relied on the Metripol measurements, which measure the birefringence of the diamond, to determine whether the Samples are infringing. The Court found that the Samples all had a low optical birefringence within the SG 872 range, which meant that they infringed Claim 1.
- (b) Claim 62. The Court found that the electron paramagnetic measurements of the Samples were evidence that the Samples were grown with a process that had a nitrogen range that fell within the range of Claim 62 of SG 872. The Court also reviewed the defendant's evidence on its manufacturing process, and concluded that the range of nitrogen used fell within the range of Claim 62 of SG 872.

SG 508 – Validity and Infringement

Claim 1 of SG 508 is a process claim covering the conversion of the starting colour of a CVD diamond to any one of a number of desirable colours via annealing (i.e. heat treatment). The Court concluded that Claim 1 of SG 508 lacks novelty as it was anticipated by several pieces of prior art that also disclosed and enabled the process of annealing CVD diamonds to produce a desired colour. The Court also concluded that Claim 1 of SG 508 lacked inventiveness as the prior art would have informed the person skilled in the art that annealing a CVD diamond under suitable conditions would result in a change in colour, much like natural diamonds and diamonds made using HPHT technology.

Notwithstanding the above, the Court noted that SG 508, if valid, would have been infringed by Sample 3, which had been annealed.

Comment

This decision brings clarity to various aspects of patent infringement suits:

- (a) Where a trap-purchased sample is adduced as evidence of infringement, the plaintiff need only prove on a balance of probabilities (as opposed to beyond a reasonable doubt) that the sample originated from the defendant and is the very same sample tested for infringement. Further, although the burden of proof falls on the plaintiff, it does not behove the defendant to advance speculative arguments or decline to adduce positive evidence to show that the samples did not originate from it, especially if it is in a position to adduce such evidence.
- (b) Where experimental evidence is adduced by one party, it is open to the other party to conduct their own experiments to determine whether the results are accurate. Failure to request for repeat experiments or to conduct their own experiments may lead the Court to accept that the experimental steps exhibited would produce the results alleged, as well as place weight on evidence of the actual experiments that have been tendered.

- (c) The defendant in this case attempted to rely on the Court of Appeal's statement in *Sunseap Group Pte Ltd and others v Sun Electric Pte Ltd* [2019] 1 SLR 645 ("**Sunseap**") that "[i]f the court finds in the defendant's favour that the independent claims are invalid, it follows that the dependent claims must also fall". While the High Court in this case did not make any comment on the correctness of the Court of Appeal's statement in *Sunseap*, it found the case to be distinguishable in the context of SG 872 as independent Claims 1 and 62 were found valid.

Jason Chan, Melvin Pang, Nicholas Tong, and Ong Eu Jin of Amica Law LLC represented the Plaintiff, E6, in this matter.

This case note is intended to provide general information only and should not be relied upon as an exhaustive or comprehensive statement of law. Should you have any specific questions, please speak with your usual contact at Amica Law LLC, or you may direct your query to mail@amicalaw.com.

We wish to express our thanks to Melvin Pang for his contributions to this case note.

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