On behalf of the Claimant
Witness: H Hinnant
Exhibits HH-3-HH-6

18 February 2024

Claim No: IL-2021-000019

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND & WALES
INTELLECTUAL PROPERTY LIST (ChD)

B E T W E E N :

CRYPTO OPEN PATENT ALLIANCE
(for itself and as Representative Claimant on behalf of
Square, Inc., Payward Ventures, Inc. (DBA Kraken),
Microstrategy, Inc., and Coinbase, Inc.) **Claimant**

-and-

DR CRAIG STEVEN WRIGHT

Defendant

SECOND WITNESS STATEMENT OF
HOWARD HINNANT

I, HOWARD HINNANT, of [redacted] will say as follows:

1. I am the same Howard Hinnant that made an earlier witness statement in these proceedings. This statement has been prepared by Bird & Bird following an exchange by email, though I am told by Bird & Bird that our exchanges are considered privileged. This statement uses my own words and sets out facts and matters that are within my own knowledge unless otherwise stated: where I refer to facts within my own knowledge, I believe them to be true. Where I refer to information from other sources, I have identified my sources and the information it is true to the best of my knowledge and belief. I have not referred to any other documents than those mentioned and exhibited in this statement.

2. Bird & Bird supplied me with extracts of Dr Wright's evidence from Day 5 of his cross examination in this trial that are relevant to my evidence, namely {5/114/12}-{5/119/16}, and I have been asked whether I have any comments in response to these

{5/114:12}-{5/119:16}

extracts. I set out below some overview matters and I then address certain statements made by Dr Wright from those extracts, giving my factual commentary on those statements.

3. In this statement, I also make a clarification in relation to my first witness statement.

Overview Matters

4. In my first witness statement, I explained that it would not have been possible to use <chrono> or sleep_for in C++ code in October 2007, and that therefore three code files containing these could not date from that time.

5. As I understand Dr Wright's evidence, he says that the files did date from that time, claiming that he developed his own library using the header file <chrono>, based on an existing library called Project Chrono.

6. Project Chrono is not a time library as std::chrono is. It is a physics simulation library. One would not modify a physics simulation library to come up with a time library. The simularities between Project Chrono and the C++ standard header <chrono> end with the name "chrono".

7. It is universal practice for all developers of non-standard libraries to put a filename extension on their headers, typically .h. For example, the Project Chrono library which Dr Wright references follows this guideline: https://github.com/projectchrono/chrono/tree/main/src/chrono/core (shown at Exhibit HH-3). {D/496.1}

8. None of the files at the above link are extension-less. They all have a .h (for header) or .cpp (for source). And this project does not even have a header called chrono.h which Dr Wright might have conceivably modified to chrono.

9. What I understand Dr Wright is claiming is that he created a file with a name identical to what would be adopted by the C++ standard in the future, and in a style that only the C++ standard uses (extension-less). Everyone else uses extensions for their header names. That alone is a striking coincidence that any C++ programmer would find difficult to accept.

10. In addition, Dr Wright's code uses the phrase "std::chrono::milliseconds". However, Project Chrono does not even use class types to model time units like the standard library does. It typically uses the built-in type double instead. So, Dr Wright claims to have invented the namespace std::chrono and the class type milliseconds, identical in

syntax to what would be proposed for the C++ standard in the future. That strikes me as another remarkable coincidence.

11. In conjunction with “std::chrono::milliseconds”, Dr Wright’s code uses the syntax “std::this_thread::sleep_for”. This too would not be proposed for the C++ Standard until after the last file modification dates for the code files referred to in my first statement. That strikes me as a third remarkable coincidence.

{5/114:12}-{5/114:22}

Project Chrono and std:: chrono: {5/114/12}-{5/114/22}

12 Q. Page 2, second line down, please {PTR-F/69/2}. Do we
13 see, the second line down has a line of code:
14 "std::this_thread::sleep_for
15 (std::chrono::milliseconds(latency)) ..."
16 Do you see that?
17 A. I do.
18 Q. Now, you're aware that Mr Hinnant, the lead designer and
19 author of the Chrono time utility, has given evidence
20 that it was first standardised for C++ in 2011, yes?
21 A. Yes, and I stated that this was using Project Chrono.
22 Project Chrono first was developed in 1996.

12. As I have mentioned above, there is no relationship between Project Chrono, and std::chrono, except the name “chrono”. Project Chrono is not currently in namespace std, and never has been. Namespace std is reserved for the standard C++ library.

{5/114:12}-{5/115:17}

Standard Libraries associated with Integyrs - {5/114/12}-{5/115/17}

24 Mr Hinnant has also explained that "sleep_for" was also
25 standardised for C++ in 2011. Are you aware of that
1 evidence?
2 A. Yes, but I also note that Integyrs, the company that
3 I had, the function was producing standardised
4 libraries, so sleep was not an unusual area in C code,
5 and because I was producing code both for simulations
6 and in addition for gaming, what Integyrs does, if you
7 look at the Wayback Machine in 2009, it produces
8 standard libraries, statistical libraries, crypto
9 libraries and others.

13. I have looked online, and I cannot find any C++ standard libraries associated with Integyrs.

{5/115:10}-{5/115:17}

C++ Standard Libraries - {5/115/10}-{5/115/17}

10 Q. Dr Wright, you're aware that Mr Hinnant's evidence is
11 that looking at this code, it couldn't have appeared in
12 a file actually dating from October 2007. You're aware
13 of that evidence, aren't you?
14 A. Yes, he's made a presumption that the only version that
15 could exist is his. He has overlooked the way that I've
16 said I used Project Chrono and he assumed that no one
17 would actually make standard libraries outside of him.

14. Dr Wright states that he made C++ standard libraries, yet in 2007 there was no standard library header named <chrono>. It had not even been proposed. The public proposal in 2007 was to put this functionality in header <date_time>, paper N2447 dated 2007-10-04:

{D/496.2}

https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2007/n2447.htm (shown at Exhibit HH-4).

15. This has the header <date_time>, class milliseconds, std::this_thread::sleep (not sleep_for).

{5/17:12}-{5/17:20}

Sleep function: {5/17/12}-{5/17/20}

12 ...However,
13 what we have are different versions of C and C++,
14 my Lord. You had DEC had their own version, which was
15 both on their Unix and their VMS machines; Solaris,
16 which was my preferred one, had its own version; IBM had
17 its own version; and then these were taken and
18 integrated into Linux and the ANSI free version. So the
19 original was that sleep/sleep_for, etc, was actually in
20 other versions of C.

16. The C language is an international standard. The version C99 (published in 1999), which was the latest version of C in 2007, did not have a sleep function. That functionality was added in 2011 and was named thrd_sleep: https://en.cppreference.com/w/c/thread/thrd_sleep (shown at Exhibit HH-5).

{D/496.3}

17. POSIX, another standard, did have several versions of sleep functionality. They had these names: sleep, usleep, and nanosleep No language or specification had the spelling “sleep_for” prior to C++ in 2011. Not C, POSIX, Java, Ada, Pascal, ObjC, Cobol, nor Fortan.

The use of “::”: {5/18/10}-{5/18/11}

{5/18:10}-{5/18:11}

10 ...The "::" is a standard C++ format
11 going back to the beginning of C, not C++.

18. This is not true. The string “::” does not appear in my copy of the C11 standard and it was in fact invented in C++.

Clarification in relation to my First Witness Statement

{D/495}

19. The paper referenced at Exhibit HH-1 (N2661) to my first statement is not strictly the first paper to propose both <chrono> and sleep_for. This paper (N2615): https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2008/n2615.html,

{D/496.4}

predates Exhibit HH-1 by about a month: 2008-05-18. It is shown at Exhibit HH-6. N2615 is otherwise essentially identical to Exhibit HH-1. This change of publication by one month earlier does not change anything I have stated about N2661, except that I should have referred to N2615 as the first proposal of <chrono> and sleep_for instead.

Declaration of Howard Hinnant

I understand that the purpose of this witness statement is to set out matters of fact of which I have personal knowledge. I understand that it is not my function to argue the case, either generally or on particular points, or to take the court through the documents in the case. This witness statement sets out only my personal knowledge and recollection, in my own words.

On points that I understand to be important in the case, I have stated honestly (a) how well I recall matters and (b) whether my memory has been refreshed by considering documents, if so how and when.

I have not been asked or encouraged by anyone to include in this statement anything that is not my own account, to the best of my ability and recollection, of events I witnessed or matters of which I have personal knowledge. I believe the facts stated in this statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

Signed by Howard Hinnant: .. DocuSigned by: Howard Hinnant EC58AA9E867A4A8... **.....**

Date: 18/2/2024