UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

STIHL INCORPORATED and ANDREAS STIHL AG & CO. LG,
Petitioner,

v.

ELECTROJET TECHNOLOGIES, INC.,
Patent Owner.

Case IPR2018-00018
Patent 6,955,081 B2

Record of Oral Hearing
Held: January 24, 2019

Before JOSEPH A. FISCHETTI, MEREDITH C. PETRAVICK, and WILLIAM V. SAINDON, *Administrative Patent Judges.*

APPEARANCES:

ON BEHALF OF THE PETITIONER:

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ON BEHALF OF THE PATENT OWNER:

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The above-entitled matter came on for hearing on Thursday, January 24, 2019, commencing at 9:00 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia.

P R O C E E D I N G S

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JUDGE SAINDON: Good morning. Please be seated.

This is an oral hearing for IPR2018-00018. I am Judge Saindon. We have here Judge Fischetti and Judge Petravick. We have allotted one hour for each party. You don't have to use all your time if you don't want to.

Petitioner, I believe we have you going first. Any time you want to reserve for your rebuttal, let us know when you come up, and you can get started whenever you want. I will keep time on my computer here. I will try to give you warnings.

MR. HILTON: Thank you. Good morning. I would like to reserve probably 20 minutes, if you could give me a warning.

JUDGE SAINDON: Sure.

MR. HILTON: So, good morning, I am Robert Hilton from McGuire Woods for Petitioner. With me today are my colleagues, David Finkelstein and George Davis.

I would like to start today by turning to slide 3 of the slide deck. Slide 3 summarizes the issues that remain in dispute in this IPR. The issues are fairly concise, and they generally revolve around the combinability of the references that Petitioner has presented. I want to first discuss Abe and Kupske and the motivation to combine, and then turn to the Patent Owner's arguments regarding inoperability of the combination.

So Abe and Kupske are combinable because there's a specific motivation in the references themselves to combine the references.

Let's turn now to slide 16, please. So this slide illustrates a figure from Abe that shows an internal combustion engine that has an intake

manifold pressure sensor that's shown here in red, and a crank angle sensor, which is shown in green. Abe discloses that the pressure sensor is capable of measuring the intake manifold pressure to determine the amount of air that is admitted into the piston cylinder.

Abe needs to determine engine speed in order to operate and it describes using the crank angle sensor to make that engine speed determination. So that's actually in Abe, it says, you know, that we need to be able to determine this engine speed.

Kupske, just like Abe, discloses an internal combustion engine, but it describes using intake pressure signals to determine the engine speed as a backup to a traditional crank angle sensor in the event that there's a failure of those sensors. Briefly, the way this is done is discussed in paragraph 16 of Kupske, which describes finding the cycle time of the engine. The cycle time is the time that it takes for a piston to complete -- to make a complete engine cycle.

So in a two-stroke engine, a complete engine cycle would be characterized by one revolution of the engine. In a four-stroke engine, a complete engine cycle would be characterized by two revolutions of the engine.

If we go to slide 17. So this is a graph from Kupske, it's Figure 4, and this figure helps show the relationship between the KW signal, it's shown up there in green. That's usually the signal that is supplied by a crank angle sensor, and this graph shows the relationship between that signal and the intake air pressure, which is on the bottom shown in red.

This graph demonstrates that the intake air pressure sensor can be a proxy for the crank angle sensor in determining the cycle time. So just to

step back a second and look at that graph, the cycle time here is illustrated as the time that occurs between the dips in the pressure graph. These dips represent pressure drops during the intake stroke of the piston. So when the piston moves to intake air, there's an actual pressure drop in the intake manifold, and that's why you have these dips in the graph.

So based on this determination of engine cycle by the pressure sensor, in other words, we know when that intake -- that intake stroke occurs when it repeats, based on this determination of the engine cycle, the engine speed can actually be calculated because the speed is actually just the number of revolutions of the engine per that unit time, which here is the cycle time.

The parties have actually not disputed that Kupske teaches determining engine speed in this way. Both of the experts in the case, Petitioner's expert, and Dr. Davis, have confirmed that Kupske determines engine speed based on intake pressure.

So I want to circle back to the motivation to combine here. There's a powerful motivation here, which is expressly discussed in Kupske. Kupske describes the problems with crank angle sensor failure in engines just like Abe, and then it proposes a solution to that problem, which is to replace the functionality of the crank angle sensor with the functionality of the intake pressure sensor.

The Board agreed with this motivation to combine the references in its institution decision. The record has been more fully developed post-institution, and it only further supports that decision that was made initially by the Board.

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