FORD MOTOR COMPANY v. PAICE, L.L.C., ET AL.

NEIL HANNEMANN (416)

September 4, 2015

Prepared for you by

Bingham Farms/Southfield • Grand Rapids
Ann Arbor • Detroit • Flint • Jackson • Lansing • Mt. Clemens • Saginaw

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORD MOTOR COMPANY
Petitioner,
v.
PAICE LLC & ABELL FOUNDATION, INC.
Patent Owner

U.S. Patent No. 7,237,634
IPR Case No.: IPR2014-01416

Videoconference Deposition of NEIL HANNEMANN
Washington, D.C.
Friday, September 4, 2015
1:05 p.m.

Job No. 90945
Pages 1 - 29
Reported by: Karen Young

Videoconference Deposition of NEIL HANNEMANN, held at the offices of:
FISH & RICHARDSON P.C.
1425 K Street, Northwest
11th Floor
Washington, D.C. 20005
(202) 783-5070

Pursuant to notice, before Karen Young, Notary Public of the District of Columbia.

APPEARANCES

ON BEHALF OF FORD MOTOR COMPANY:
(by videoconference)
ANDREW B. TURNER, ESQUIRE
JOHN P. RONDINI, ESQUIRE
FRANK A. ANGILERI, ESQUIRE
BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, Michigan 48075
(248) 358-4400

ON BEHALF OF PAICE LLC & ABELL FOUNDATION, INC.:
BRIAN J. LIVEDALEN, ESQUIRE
FISH & RICHARDSON P.C.
1425 K Street, Northwest
11th Floor
Washington, D.C. 20005
(202) 783-5070

CONTENTS

EXHIBITS

(Attached to Transcript)

Page 5

PROCEEDINGS
(Deposition Exhibit Numbers 1 through 3 were marked for identification.)
NEIL HANNEMANN,
having been duly sworn, testified as follows:
EXAMINATION BY COUNSEL FOR FORD MOTOR COMPANY
- - -
BY MR. RONDINI:
Q For this matter, this is the deposition for matter IPR2014-01416. For the record, Mr. Hannemann, can you state your full name?
A Neil Hannemann.
Q And would the court reporter please hand Mr. Hannemann the exhibit labeled Exhibit 1? Mr. Hannemann, for the record, what is Exhibit Number 1?
A This is my declaration in support of the patent owner's response in this matter.
Q Mr. Hannemann, before we -- we dive into your declaration in detail, could you please explain to me what your understanding of hysteresis is?
A You mean like the -- the Webster Dictionary understanding?
Q No, in -- in your technical understanding, what -- as an engineer and somebody who's worked in the engineering field for over 20 years, what is

Page 6

hysteresis in your opinion?
A Well, hysteresis is, as I've mostly encountered it, it's having a different value when you're increasing or decreasing some type of function.
Q Okay, and -- and in your experience, is hysteresis a -- a form of control strategy that is commonly employed?
MR. LIVEDALEN: Objection, form.
A I think hysteresis is more of a characteristic, and it's sometimes -- it's not related to a control strategy. It's sometimes something that can occur in a, you know, mechanical device, so --
Q So within a mechanical -- I'm sorry, go ahead.
A Well, I should say, for example, a shock absorber has hysteresis.
Q But the hysteresis that's in a shock absorber, wouldn't an engineer have designed the shock absorber to have that hysteresis function?
A No, there's -- sometimes hysteresis is a characteristic that occurs, and engineers understand it, but it -- it can be just a natural occurrence.
Q Okay. Now, in your engineering experience,

Page 7

you've worked on control strategies, correct?
A Yes.
Q Okay. Do you understand what hysteresis is with respect to control strategies?
MR. LIVEDALEN: Objection to form.
A It can be -- yes, I do understand.
Q What is your understanding of hysteresis with respect to control strategies?
A It's a factor that you can -- can build into your controls to -- to create that, to create the hysteresis.
Q Okay, let's -- let's -- you kind of did a circular answer there and you answered the question with a question. What is your understanding of hysteresis with respect to control strategies? Let's try that again.
A Well, when you're using it in a control strategy, you're -- you're actually creating the hysteresis.
Q What are you -- what do you mean by you're creating the hysteresis?
A Well, when you're controlling something, it's not a naturally occurring characteristic, so the control has to then create that hysteresis.
Q What is your definition of hysteresis?

Page 8

A Well, you know, I would probably go to the dictionary, which I don't have handy with me, to -- to really define it. You know, I've -- it's a term that is pretty broad.
Q But hysteresis is something that is commonly understood by engineers?
A Yes, and I don't know if you -- if I -- trying to just think if I actually define that in my declaration. Just going to flip through and see if I can -- yeah, I mean, I don't think I actually defined it, that generally in my declaration, so --
Q Sitting here today though, could you provide me with what your understanding -- I know it's not going to be in the dictionary and I'm not going to hold you to it. I'm just trying to understand your understanding as a technical expert, what is -- what would be your definition if someone asked you what is hysteresis?
A Well, I think we talked about it before, that it's a -- it can be a physical characteristic, and basically -- you know, prior to control systems, it was a physical characteristic, as I -- shock absorbers, rubber bushings. There's a lot of mechanical components that have hysteresis as a characteristic, and that's -- that's where it comes

Page 9

from. Now, lately control systems have -- you know, you program controlling hysteresis, and that's in a way artificially creating this characteristic that occurs in mechanical components.

Q So let's I guess maybe take a look at a couple of examples of, you know, control systems that might incorporate some type of hysteresis. You're familiar with thermostats, correct?

A Like in the house?

Q Sure, in a house.

A Sure.

Q Yeah, would -- would a thermostat in your house, would that have some type of a hysteresis built into the control system if it's electronic?

MR. LIVEDALEN: Objection, calls for speculation.

A Yeah, this is something I could never even explain to my ex-wife because she didn't -- she didn't get it, but you could -- I mean, these days a lot of thermostats are electronic and you'd program that in. In the older days it was a mercury switch that would, you know, physically give you the hysteresis characteristic in a thermostat. So that's an example of a -- of a component that has the same function but it's -- it's changed how it arrives at

Page 10

that function.

Q Right, so -- so moving from the mercury switch mechanical systems to the electronic systems that are commonly found in houses today, how would -- how would the hysteresis be implemented in a control strategy?

MR. LIVEDALEN: Objection, form.

A Yeah, you know, I haven't really analyzed a thermostat in enough detail, at least an electronic one, to -- to tell you how they would do it, but I would think they're, you know, somehow emulating what a mercury switch did, and maybe with electronics, you've got an opportunity to improve on that.

Q Well, in electronics, would you -- would you have some type of a setpoint where you would set the temperature, and the hysteresis would ensure your heater or your air conditioning doesn't turn on and off rapidly if the temperature is fluctuating around that setpoint?

MR. LIVEDALEN: Objection, form, calls for speculation.

A Well, that's, you know, both the electrical and mechanical ones, you know, that's the purpose of the -- the switch in the mechanical system. That's -- that's what it did, and then you could emulate

Page 11

that electronically and, you know, even -- likely even have it calibrateable, if that's a word, or a user could have some input into those criteria, and with a mechanical system, you wouldn't.

Q So with electronic control systems, if I'm understanding your testimony correct, hysteresis is a form of control strategy where you would have some type of a set threshold or a setpoint, and the hysteresis would be used to not have fluctuations around that setpoint. Is that an accurate assessment of what your understanding of hysteresis is?

MR. LIVEDALEN: Objection, form.

A Well, using the word "setpoint," which is very specific to this -- this matter, and I don't know if the thermostat designers used the terminology "setpoint," but I think that the -- in a thermostat, there's actually two points. There's a high and a low, so it -- it basically fluctuates between a high and a low point.

Q Around the threshold, so getting around from the use of "setpoint" as it's used in the -- in the patents, let's use the "threshold." It's not used in the patent claims. So it's your understanding that you would have a threshold value, and then you would have -- the hysteresis would be

Page 12

some band above and below that threshold value to ensure your furnace doesn't turn on and off if the temperature's fluctuating around that threshold; is that correct?

A Yeah, and again, I don't know the exact terms that somebody designing a thermostat might use, but you know, as a general description, I can agree with -- with -- with your statement.

Q Sure. Well, let's take it in terms or, you know, constructs of, you know, automotive technology. You understand what a cruise control system is, correct?

A Yes.

Q Would a automotive engineer implementing a control strategy for cruise control, would they implement some type of hysteresis into the cruise control?

MR. LIVEDALEN: Objection, calls for speculation.

A I think it's likely that you could do that.

Q How would they do that?

A You know, it depends -- depends upon how the system works. You have to -- you can only work with the parameters you've got involved in -- in the system.

Page 13

Q Well, how about why would an engineer implement hysteresis into a cruise control system?

A It would be for customer acceptance, so you have a system that the vehicle drives as the customer might expect it to.

Q What do you mean, customer acceptance? Why would the customer not be happy having a cruise control system without hysteresis?

A Well, you know, having not evaluated every cruise control system, but typically customers like a vehicle that has a, you know, smooth steady operation without abrupt changes, so if you put some hysteresis in the system, you can -- you can achieve that.

Q So let's -- so we have maybe an example. So if I'm understanding your testimony correctly, what you're saying is cruise control, an operator would set the cruise control let's say at 55 miles per hour, and as a vehicle is driving down the road at 55 miles an hour, the vehicle experiences a headwind and the vehicle which was set at 55 miles an hour, now the speed drops down to 53 miles an hour, and if I'm understanding you correctly, the hysteresis is used to ensure that the vehicle doesn't abruptly try to stop the vehicle to get it down to 53 miles an hour because the headwind might go away and

Page 14

the vehicle within three seconds might get back up to 55 miles an hour. Is that a correct example of why you're saying customer acceptance drives hysteresis in a cruise control?

MR. LIVEDALEN: Objection, form.

A Not -- I mean, I think as a general sense, and the point in what you said is it's -- it is related to speed, and you know, speed is all a cruise control system's looking at, or if we assume a cruise control system that's only looking at speed would make its determinations based on speed, that's correct. Now, a system can't take other factors into consideration, such as load. The vehicle speed control system's not looking at load. It's looking at speed, so it would make its decision based on speed.

Q I'm sorry, did you say now the system can take other factors such as load or cannot?

A If you -- well, the system takes into consideration whatever you design it to, so in -- in my hypothetical, a speed control system that's just looking at speed would not be able to use other factors.

Q Why?

A Because those just aren't inputs into its system.

Page 15

Q Why do you say those aren't inputs?

A That's how I defined it. I defined a speed control system that's using speed as its input, and it's developing a hysteresis characteristic around the speed, and then that's what it works with.

Q So it's your opinion that anything that deals with speed doesn't take into consideration any other inputs besides speed.

MR. LIVEDALEN: Objection, mischaracterizes previous testimony.

A I would say any system designed to operate with certain inputs doesn't consider other inputs. So going back to a thermostat, a thermostat considers temperature, not speed or not load, and the speed control system that I gave the balance to, I was looking at speed, would only look at speed.

Q But in a -- in a vehicle, I mean, I understand your analysis with respect to, you know, a thermostat not looking at speed and only looking at temperature. I wouldn't disagree with that, but in a vehicle setting where there's hundreds if not thousands of inputs to a -- you know, the ECU, one of them possibly being speed, you're saying that the system would not consider anything else but the

Page 16

speed?

A It's only going to consider what it's programmed to consider. Just because the inputs or characteristics are somewhere in the vehicle, if it's not programmed to use those, it's not going to use those.

Q But it could be programmed to -- strike that. A POSA would understand that you could use those other inputs that are being received in addition to speed, correct?

MR. LIVEDALEN: Objection, form.

A You know, I haven't considered what -- we're talking about cruise control systems, which wasn't something I considered in this -- in this matter, so I really wouldn't be able to give you an opinion on that.

Q Well, I'm just asking in general for hysteresis, you know, an engineer in designing a system, if he wanted to implement hysteresis, could implement it with whatever inputs he's provided; is that correct?

A If those inputs correctly give you the -- the end result.

Q And the end result, as you stated earlier, would be customer satisfaction. Is that one end

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.