

FORD MOTOR COMPANY v. PAICE, LLC, ET AL.

NEIL HANNEMANN

April 8, 2015

*Prepared for you by*



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<p>1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 BEFORE THE PATENT TRIAL AND APPEAL BOARD 3 4 5 FORD MOTOR COMPANY, : 6 Petitioner, : 7 v. : IPR Case No: 8 PAICE LLC &amp; ABELL FOUNDATION, : IPR2014-00570 9 INC., : 10 Patent Owner. : 11 : 12 -----x 13 14 15 Oral Deposition of NEIL HANNEMANN 16 Washington, DC 17 Wednesday, April 8, 2015 18 12:55 p.m. 19 20 21 22 23 Job No.: 78384 24 Pages: 1 - 87 25 Reported By: Rebecca Stonestreet, RPR, CRR</p>	<p>1 A P P E A R A N C E S 2 3 4 ON BEHALF OF PETITIONER: 5 FRANK A. ANGILERI, ESQUIRE 6 JOHN P. RONDINI, ESQUIRE 7 ANDREW B. TURNER, ESQUIRE 8 BROOKS KUSHMAN, PC 9 1000 Town Center 10 22nd Floor 11 Southfield, MI 48075 12 (248) 226-2913 13 14 ON BEHALF OF THE PATENT OWNER: 15 W. PETER GUARNIERI, ESQUIRE 16 LINDA LIU KORDZIEL, ESQUIRE 17 FISH &amp; RICHARDSON 18 1425 K Street, NW 19 11th Floor 20 Washington, DC 20005 21 (202) 783-5070 22 23 24 ALSO PRESENT: 25 Frances Keenan, Paice LLC</p>
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<p>1 Oral Deposition of NEIL HANNEMANN, held at the 2 offices of: 3 4 5 FISH &amp; RICHARDSON, PC 6 1425 K Street, NW 7 11th Floor 8 Washington, DC 20005 9 (202) 783-5070 10 11 12 13 14 Pursuant to notice, before 15 Rebecca Stonestreet, Registered Professional Reporter, 16 Certified Realtime Reporter, and Notary Public in and for 17 the District of Columbia, who officiated in administering 18 the oath to the witness. 19 20 21 22 23 24 25</p>	<p>1 C O N T E N T S 2 3 EXAMINATION OF NEIL HANNEMANN PAGE 4 By Mr. Angileri 5 5 By Mr. Guarnieri 83 6 7 8 E X H I B I T S 9 (Retained by Counsel.) 10 11 HANNEMANN EXHIBIT PAGE 12 1 Declaration of Neil Hannemann 5 13 2 U.S. Patent No. 8,214,097 5 14 3 U.S. Patent No. 5,343,970 5 15 4 "The Effects of APU Characteristics on the 16 Design of Hybrid Control Strategies for 17 Hybrid Electric Vehicles" 5 18 5 Curriculum Vitae 70 19 6 Supplemental Declaration 80 20 21 22 23 24 25</p>

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1 PROCEEDINGS  
2 (HANNEMANN Exhibits 1 through 4 were marked  
3 for identification and retained by counsel.)  
4 (NEIL HANNEMANN, having been duly sworn, testified as  
5 follows:)  
6 EXAMINATION BY COUNSEL FOR PETITIONER  
7 BY MR. ANGILERI:  
8 Q Can you state your name for the record,  
9 please?  
10 **A Neil Hannemann.**  
11 Q Mr. Hannemann, the reporter has marked, as  
12 Exhibits 1 through 4, documents that I expect we'll get  
13 into today.  
14 What is Exhibit 1?  
15 **A Exhibit 1 is the declaration that I prepared**  
16 **in this matter.**  
17 Q And this matter is IPR 2014-00570?  
18 **A That's correct.**  
19 Q Concerning -- strike that.  
20 What's Exhibit 2?  
21 **A Exhibit 2 is U.S. Patent 8,214,097.**  
22 Q And that's the patent that's at issue in this  
23 IPR?  
24 **A That's correct.**  
25 Q We sometimes call it the '097 patent?

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1 **A That's correct.**  
2 Q What is Exhibit 3?  
3 **A It's Patent Number 5,343,970.**  
4 Q Sometimes we call that the '970 patent?  
5 **A That's correct.**  
6 Q That's part of the prior art that's at issue  
7 in this IPR?  
8 **A Yes, it is.**  
9 Q What is Exhibit 3?  
10 **A It's an SAE paper, 950493, titled "The Effects**  
11 **of APU Characteristics on the Design of Hybrid Control**  
12 **Strategies for Hybrid Electric Vehicles."**  
13 Q One of the named authors is a person named  
14 Catherine Anderson. Correct?  
15 **A That's correct.**  
16 Q And as a result, we sometimes refer to this as  
17 the Anderson paper or just Anderson?  
18 **A Yes.**  
19 Q What did you do to prepare for this deposition  
20 and the depositions that you've had yesterday and today?  
21 **A Well, I --**  
22 MR. GUARNIERI: And I'll just caution him not  
23 to get into any privileged communications.  
24 But you can answer.  
25 **A I came here last week to meet with counsel and**

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1 **review the declaration, the prior art, and the patent.**  
2 Q When did you come here last week to meet with  
3 counsel?  
4 **A On Wednesday.**  
5 Q How long were you here?  
6 **A Probably about most of the day, the normal**  
7 **workday.**  
8 Q Did you leave at the end of the day?  
9 **A Yes.**  
10 Q Where did you go? Did you go back home?  
11 **A No, no, I stayed in Washington. I met for**  
12 **three days last week. I arrived here Wednesday and met**  
13 **Wednesday, Thursday, Friday.**  
14 Q With counsel?  
15 **A Yes.**  
16 Q Did you prepare at all on Monday?  
17 **A Yes, I did.**  
18 Q Did you -- were you on any flights on Monday?  
19 **A Yeah, I flew back here Monday.**  
20 Q From where?  
21 **A I was actually in Texas.**  
22 Q So you were in Washington, D.C., Wednesday,  
23 Thursday, Friday of last week meeting with counsel for  
24 Paice?  
25 **A Yes.**

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1 Q And then you left Washington, D.C.?  
2 **A Yes.**  
3 Q And then you came back on Monday?  
4 **A That's correct.**  
5 Q Who did you meet with on Wednesday, Thursday  
6 and Friday last week?  
7 **A Well, at various times Mr. Guarnieri,**  
8 **Mr. Marcus, and Ms. Kordziel.**  
9 MR. GUARNIERI: For the record I think he's  
10 referring to Mr. Livedalen, Brian.  
11 THE WITNESS: Oh, sorry.  
12 Q How did you prepare the declaration that's  
13 been marked as Exhibit 1?  
14 **A Quite a while ago, I reviewed all the material**  
15 **that was the prior art and the patent and had -- I came**  
16 **here to Washington to meet with counsel and discuss all**  
17 **the elements, the technical matters.**  
18 **And then I worked with counsel to, you know,**  
19 **draft up various portions of this, or add or work through**  
20 **a draft until arriving at this product.**  
21 Q Did counsel prepare first drafts of any  
22 portions of Exhibit 1?  
23 **A Yeah, there were some portions that they**  
24 **drafted up initially.**  
25 Q Do you know which portions?

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1 **A You know, I might be able to pick some out.**  
2 **I'm not sure I would be getting all of them correct.**  
3 Q Which portions of Section 8 did counsel  
4 prepare the first draft of?  
5 **A That's one where I'm not sure which section**  
6 **started with counsel or myself.**  
7 Q Can you identify any section that you prepared  
8 the first draft of?  
9 **A Yeah. My memory is probably not that good to**  
10 **go back and define it to that level of detail.**  
11 Q The other declarations that we marked in 571  
12 and 579 depositions that were yesterday and today -- do  
13 you recall those declarations?  
14 **A Yes.**  
15 Q Were they prepared in a similar manner as the  
16 manner you just described --  
17 **A Yeah.**  
18 Q -- in Exhibit 1?  
19 **A Yeah, in a similar manner.**  
20 Q And for those two declarations, can you recall  
21 any section that you prepared the first draft of?  
22 **A Some of the sections and probably the more**  
23 **technical sections are probably ones that I prepared.**  
24 **And, certainly, my background is something that I**  
25 **started.**

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1 Q Is there anything specifically that you can  
2 identify as preparing the first draft of other than your  
3 background?  
4 **A Specifically in this declaration, or are you**  
5 **talking the other ones also?**  
6 Q Any of the three.  
7 **A Any of them. I just don't remember which ones**  
8 **I started or somebody else may have started.**  
9 Q How much time did you spend preparing or  
10 working on -- strike that.  
11 How much time did you spend -- strike that.  
12 How much time have you spent in these three  
13 proceedings, 570, 571 and 579?  
14 **A I don't think I've really tracked my time for**  
15 **each proceeding, so that's hard to say.**  
16 Q What about the three proceedings combined?  
17 **A Well, these have overlapped with three other**  
18 **proceedings that are ongoing now, so it would be hard to**  
19 **really break that out.**  
20 Q Can you tell me how much time you've spent on  
21 the -- strike that.  
22 How many proceedings have you worked on for  
23 Paice thus far?  
24 **A The six that I've prepared declarations for.**  
25 Q How much time have you spent on those six

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1 declarations?  
2 **A I really don't have any idea, as I sit here.**  
3 Q Do you know how much time you spent on all six  
4 of those proceedings combined?  
5 **A Not really.**  
6 Q Do you know how much you've billed Paice for  
7 these six proceedings?  
8 **A I would have invoices, but I don't have those**  
9 **with me.**  
10 Q Can you estimate to within \$100,000 of how  
11 much you've billed Paice?  
12 **A Sure. I think it's pretty safe to say it's**  
13 **less than \$100,000.**  
14 Q Is it less than \$50,000?  
15 **A It's really hard to say without checking, but**  
16 **it's likely that it is.**  
17 Q Is it less than \$25,000?  
18 **A Probably not.**  
19 Q Can you look at Exhibit 3, please?  
20 **A (Witness complies.)**  
21 Q Exhibit 3 is the '970 patent. Correct?  
22 **A Yes.**  
23 Q The '970 patent describes a parallel system.  
24 Is that correct?  
25 **A Yes, it does.**

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1 Q Does the '970 patent have a mode where only  
2 the motor is used to propel the vehicle?  
3 **A Yes, it does.**  
4 Q And does it have a mode where only the engine  
5 is used to propel the vehicle?  
6 **A Yes, it does.**  
7 Q Does it have a mode where the engine and the  
8 motor are both used to propel the vehicle?  
9 **A Yes, it does.**  
10 Q When the motor is used to propel the vehicle,  
11 is the engine disconnected from the wheels through a  
12 clutch?  
13 MR. GUARNIERI: I'm going to object to the  
14 extent it calls for speculation.  
15 **A Figure 3 shows a clutch, and up through**  
16 **Figure 9 shows a clutch. So at least the ones disclosed**  
17 **in those figures appear to use a clutch to disconnect the**  
18 **engine.**  
19 Q Is it true that in order to run in the  
20 motor-only mode for the '970 patent, you actually have to  
21 disconnect the engine from the wheels?  
22 **A Are you speaking generically or in the scope**  
23 **of this patent?**  
24 Q In the '970 patent.  
25 **A I don't recall seeing any language where it**

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1 **specifically requires the clutch be disconnected.**  
2 Q If the clutch doesn't disconnect the engine,  
3 would you agree, then, that the engine would always have  
4 to be running?  
5 **A Unless there's some mechanism within what they**  
6 **describe as a torque transfer unit that could allow the**  
7 **unit to --**  
8 THE REPORTER: A torque trans?  
9 THE WITNESS: Torque transfer unit.  
10 Q Do you agree that for the -- to run in a  
11 motor-only mode, somehow -- strike that.  
12 Do you agree that for the '970 to run in the  
13 motor-only mode and not -- strike that.  
14 Do you agree that for the '970 patent to run  
15 in the motor-only mode, it somehow has to disconnect the  
16 engine from the wheels in order to do that?  
17 **A I would think that's a reasonable thing to do.**  
18 **I just don't see where it specifically states that.**  
19 Q Do you think that's how a person of ordinary  
20 skill in the art would understand the '970 patent?  
21 **A I think in the presence of the clutch, that's**  
22 **how someone would understand it operated.**  
23 Q So just to be clear, a person of skill in the  
24 art would understand that when the '970 patent is running  
25 in motor-only mode, it's using the clutch to disconnect

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1 the engine from the wheels. Do you agree with that  
2 statement?  
3 **A Yes, I do.**  
4 Q Do you agree that an object of the invention  
5 of the '970 patent is reducing emissions?  
6 **A I think that's an aspirational goal, to reduce**  
7 **emissions, yes.**  
8 Q In fact, if you look at Column 5, Lines 24 to  
9 30, isn't that the first stated object of the invention  
10 in the '970 patent?  
11 **A Yes.**  
12 Q Do you agree that in the acceleration  
13 hill-climbing mode of the '970 patent, the motor is used  
14 to supplement the engine?  
15 MR. GUARNIERI: Objection. Assumes facts not  
16 in evidence and calls for speculation.  
17 **A Yeah, I agree in the high-speed**  
18 **acceleration/hill-climbing mode, both the internal**  
19 **combustion engine and the electric motor provide torque**  
20 **to the road wheels.**  
21 Q Do you agree, then, that in that situation,  
22 the engine is providing less than the amount of torque  
23 required to operate the vehicle?  
24 **A Yeah. You have torque coming from both the**  
25 **engine and the motor, so neither one is providing the**

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1 **total power required. So they're both providing less.**  
2 Q Do you agree that the '970 patent can enter an  
3 acceleration hill-climbing mode before it reaches the  
4 engine's MTO or minimum torque output?  
5 **A Yeah. According to the '970, it enters that**  
6 **mode based on vehicle speed.**  
7 Q And that can -- I don't agree with you there,  
8 but you agree that can happen before the engine reaches  
9 its maximum torque output or MTO?  
10 MR. GUARNIERI: Objection. Form.  
11 **A Yeah. And I guess the word "reaching" implies**  
12 **that the engine is already on. So if the engine is not**  
13 **already on, it's not going to reach any torque.**  
14 Q Are you saying that the '970 can enter  
15 acceleration hill-climbing mode by starting with the  
16 motor and then adding the engine?  
17 **A I think that's one way it can enter that mode,**  
18 **yes.**  
19 Q And obviously in that case you are using both  
20 the motor and the engine in a situation where the engine  
21 has not yet hit its maximum torque output. Correct?  
22 **A Yeah. I think that there's points in the**  
23 **high-speed acceleration/hill-climbing mode where the**  
24 **engine is not at its maximum torque.**  
25 Q And you're using the motor and the engine at

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1 those times. Right?  
2 **A Yes.**  
3 Q Do hybrid vehicles use AC motors or DC motors?  
4 **A I would say most of them use AC motors**  
5 **currently. There have been some that have used DC motors**  
6 **in the past.**  
7 Q In the past, were DC motors a better fit?  
8 MR. GUARNIERI: Objection. Vague.  
9 **A Yeah. It depends on the design goals and the**  
10 **design criteria.**  
11 Q Which is a better -- which is better to use?  
12 AC motors or DC motors?  
13 MR. GUARNIERI: Same objection. Vague.  
14 **A Yeah. It depends on what's important in your**  
15 **design. If it's performance, weight, cost, all those**  
16 **issues can drive a different design decision.**  
17 Q Is a person of ordinary skill in the art going  
18 to consider those design criteria, that you just  
19 mentioned, when making a choice between AC and DC motors?  
20 **A Yeah. I think every choice designing a car**  
21 **has cost, weight, and performance implications.**  
22 Q So would a person of ordinary skill in the art  
23 consider the factors you identified in choosing between  
24 AC and DC motors?  
25 **A Those are some of the factors they would**

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