

UNITED STATES INTERNATIONAL TRADE COMMISSION

In the Matter of:	)	Investigation No.
CERTAIN CAPACITIVE DISCHARGE	)	337-TA-1390
IGNITION SYSTEMS, COMPONENTS	)	
THEREOF, AND PRODUCTS CONTAINING	)	
THE SAME	)	

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1 UNITED STATES INTERNATIONAL TRADE COMMISSION

2 Washington, D.C.

3 BEFORE THE HONORABLE CLARK S. CHENEY

4 Chief Administrative Law Judge

5

6 In the Matter of:) Investigation No.

7 CERTAIN CAPACITIVE DISCHARGE) 337-TA-1390

8 IGNITION SYSTEMS, COMPONENTS)

9 THEREOF, AND PRODUCTS CONTAINING)

10 THE SAME)

11

12

13 International Trade Commission

14 500 E Street, S.W.

15 Washington, D.C.

16

17 Friday, September 27, 2024

18

19 EVIDENTIARY HEARING - VOLUME V

20

21 The Hearing commenced in Courtroom A, pursuant to the
22 notice of the Judge, at 9:00 a.m. Eastern.

23

24 Reported by: Marjorie Peters, FAPR, RMR, CRR

25

1 Q. Did you prepare a demonstrative to help in your
2 testimony today?

3 A. Yes.

4 MS. HOEKEL: Your Honor, CDX-0005. It says C in
5 the slide. It's not a C.

6 CDX-0005 is the demonstrative slide of
7 Dr. Eisenstadt.

8 BY MS. HOEKEL:

9 Q. Dr. Eisenstadt, you testified earlier in this
10 case on infringement; correct?

11 A. Yes, I did.

12 Q. Do you recall describing the improvement of the
13 '603 patent earlier in this case?

14 A. Yes, I did.

15 Q. What is the improvement that the '603 brought to
16 the prior art?

17 A. Well, the '603 patent provided a description of
18 a control circuit that launches pulses into the primary
19 transformer so that they accumulate with a resonance in the
20 transformer, and then can provide increased voltage
21 sparking capability on the output of the transformer, or
22 they can be used to provide improved current duration or
23 amplitude through -- to a spark plug.

24 Both the -- the transformer is connected to a
25 spark plug, the ignition transformer.

1 Q. Does the '603 discuss ringing action?

2 A. Yes, it does.

3 Q. What does the '603 teach us about ringing
4 action?

5 A. The '603 teaches us to use the ringing action,
6 or exploit the ringing action through control signals to
7 build up energy in the transformer to have improved voltage
8 capability to make a spark or to have improved spark
9 duration or amplitude, or both.

10 Q. How does it do that?

11 A. Well, it has a series of diagrams, and it has
12 text to describe how to -- what pulses to provide, when to
13 provide them, and how to set up the system to do so.

14 Q. Is that improvement in any of the prior art
15 references that Dr. Ehsani testified about today?

16 A. No.

17 Q. Is that improvement in the Grather reference?

18 A. No.

19 Q. Is that improvement in the '904 patent?

20 A. No.

21 Q. Is that improvement in any of the combination --
22 excuse me.

23 Is that improvement in the combination of
24 Grather and the '904 patent?

25 A. No.

1 A. Okay. I've got it.

2 Q. What is Grather directed to?

3 A. Okay.

4 Grather is an interesting capacitive -- not even
5 a capacitive discharge system. It's an interesting
6 ignition system. It's a charge accumulation system.

7 Do you want me to go into any detail here?

8 Q. Yes, please.

9 A. Okay.

10 So what Grather is doing is it's creating a
11 bunch of ignition pulses -- pulses -- not even ignition
12 pulses -- pulses using the circuit in 19, and the switch in
13 20. Those pulses are going into a coil, 22, and then
14 they're getting -- going through a diode, 23, and then they
15 get accumulated on a lead to the spark plug with a voltage,
16 which is 23 prime.

17 So what is happening in this is that a voltage
18 is being added to 23 prime as the switch goes.

19 And then -- do you want me to continue?

20 Q. Well, is there more that you want to talk about
21 that Grather is directed to?

22 A. Yeah.

23 Well, Grather is directed to increasing that
24 voltage on 23 prime until it's big enough such that it
25 creates a spark.

1 Q. Dr. Ehsani testified -- did you hear Dr. Ehsani
2 testify that the Grather pulse train is timed in
3 synchronism?

4 A. Well, the Grather pulse train is actually, if
5 you go into Grather, it's actually created to be in the
6 same frequency as the transformer, and the lead, and
7 everything else there.

8 So the -- you know, Grather actually wants you
9 to design your transformer, and lead, and everything else
10 so that you have a frequency, and the -- then the frequency
11 of the system will be meshed to that.

12 Do you have any more questions about that?

13 Q. Is that different from the '603 discussion of
14 timing?

15 A. Yeah.

16 The '603 timing, if you read through the '603
17 carefully, it says that it can adapt itself to a variety of
18 coil systems, and sparks, and leads.

19 So it's supposed to adapt the timing of the '603
20 pulses to systems that are added to it. The control pulses
21 are supposed to adapt to the systems that are added to it.

22 Q. Does Grather require a specific coil structure?

23 A. A specific what?

24 Q. Coil structure?

25 A. Specific coil structure.

1 Yeah. Again, that's the -- you have to design
2 the L and C of the coils to match the frequency that you
3 are using in 19.

4 So that is a specific coil structure required by
5 Grather.

6 Q. You referenced L and C; is that correct?

7 A. Yeah.

8 Q. What does Grather tell you -- did you look at
9 the discussion in Grather of the variables L and C?

10 A. Yeah.

11 Actually, the Ls and Cs in the Grather or the
12 resonance in Grather are different than the resonance in
13 the '603 patent.

14 So Grather, if you go into -- it's technical,
15 but if you want to go into Figure 2, I think it shows.

16 Q. Let's pull up 315 at Figure 2, which is likely
17 on page 3.

18 A. Okay.

19 So Figure 2 shows an equivalent circuit diagram
20 for the switch, which is 17 on the left, and the coil,
21 which you can see is W1, W2, and everything in the little
22 box around that coil with U1 there is the coil. That's
23 their model.

24 Then they have the diode, which is 23, which we
25 pointed out, increases accumulation. Then the accumulation

1 is on C2, which creates U2 in Grather.

2 So the coil in there is made to resonate, and
3 then energy is added to the diode to C2, but the difference
4 in the system from '603 is, there is no diode.

5 So as the '603 system has the coil, plus the
6 stray wire, plus the spark plug being resonated
7 simultaneously.

8 So you see in the oscillations in the '603, or
9 the resonance in '603, you're looking at the resonance at
10 the spark plug at 24 in '603, when you do the open-circuit
11 measurement.

12 In Grather, you're not looking at the resonance
13 of the spark plug, that would be at U2, in Grather. That's
14 what the accumulation is. In Grather, you're looking at
15 the resonance at U1.

16 So it's a different system. It has additional
17 components, and the lead is significant because Grather
18 uses that to accumulate charge. So it has to have a large
19 amount of capacitance there because you couldn't accumulate
20 a significant charge on it if it didn't.

21 So the C2 outside of Grather is -- outside the
22 diode has to be significant.

23 Also, the switching action, you can see the C2
24 is well after the switch here, not before the switch in
25 '603.