BEFORE THE UNITED STATES OF AMERICA

CONSUMER PRODUCT SAFETY COMMISSION

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In the Matter of: :

ZEN MAGNETS, LLC : CPSC Docket No. 12-2

STAR NETWORKS USA, LLC : CPSC Docket No. 13-2

Respondents. :

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DEPOSITION OF DAVID A. RICHTER

Bethesda, Maryland

Thursday, July 24, 2014

REPORTED BY:

SARA A. WICK, RPR, CRR

Deposition of DAVID A. RICHTER, called for examination pursuant to notice of deposition, on Thursday, July 24, 2014, in Bethesda, Maryland, at the offices of the United States Consumer Product Safety Commission, 4330 East West Highway, Seventh Floor, at 10:13 a.m., before SARA A. WICK, RPR, CRR, and a Notary Public, when were present on behalf of the respective parties:

RAY ARAGON, ESQ.
JAN ARGABRIGHT, ESQ.
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On behalf of the CPSC

-- continued --

APPEARANCES (continued):

DAVID JAPHA, ESQ.
The Law Offices of David C. Japha, P.C.
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On behalf of Respondents

Also Present: Veronica Hazzard, Shihan Qu

P R O C E E D I N G S

(Exhibits Richter 1 through 5 identified.)

Whereupon,

DAVID A. RICHTER

was called as a witness and, having first been duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. ARAGON:

Q Would you, please, state your name and address.

A My name is -- do you want my professional address or my personal address?

Q Professional address, please.

A My name is David Andrew Richter, and my address is Department of Mathematics, Western Michigan University, Kalamazoo, Michigan 49008-5248.

Q And I want to ask, is there any reason why you can't give full, complete, and accurate testimony today?

A No.

Q Okay. Dr. Richter, my name is Ray Aragon, and I will be asking some questions. And let me

pages 2 through 5 of your resume?

A Well, there's the Miracle Octad Generator. That's paper and pencil; it's like a little pencil and paper game. I think Zome and paper is a pretty good description and, occasionally, balls and straws, you know, wooden balls and straws.

Q So would it be correct to say that in your academic and teaching career, those media that you just identified have been the predominant ones that you've used for teaching?

A Yes.

Q Has any of your research specifically involved magnets or the physical properties of magnets?

A No.

Q And is it correct to say that your teaching to date has not involved magnets or the physical properties of magnets?

A Well, you're using a word, "teaching." I haven't used it formally in the classroom but, certainly, in several informal discussions with students once in a while.

Q Okay. Can you give me any detail about those several formal discussions with students once in a while?

A Well, more often than not, it's like, what an awesome thing, you can make the platonic solids very quickly using these magnet balls.

Q Okay. But as stated in Exhibit 5, which is your report, that's -- you've never used them in the classroom before?

A That's right.

Q I'm going to ask a question, because most of us don't understand mathematics the way you do. Could you explain to me the fields of mathematics in which you're primarily interested?

A These days, it's discrete geometry, which is basically a modern incarnation of classical Euclidean geometry.

I've also done research in mathematical physics, which is mostly involving -- mostly involves the study of differential equations that occur in physics. Differential equations is a very complicated subject. If a physicist or chemist

project to a lower dimensional space.

Q And that's something that you try to identify and describe mathematically?

A Right.

Q What are green quaternions?

A Green quaternions, that's a good question. I haven't thought about that since 2006, as you can see from my CV.

Well, I have to talk about quaternions first, don't I?

MR. JAPHA: It's for you to answer. It's his question but your answer. So you drive that answer.

BY MR. ARAGON:

Q Let me ask this: Does it have anything to do with the opinions you're expressing about spherical, high-powered, rare-earth magnets?

A Very distantly, yes.

Q Please explain.

A We're talking about ideas of three-dimensional geometry. Honestly, there are a lot of phenomena in three-dimensional geometry that

are directly related to the geometry of quaternions. So this is Hamilton, right, invented quaternions and then shortly thereafter discovered that you can use quaternions to study ideas in electricity and magnetism.

Q Okay. So --

A Which is three-dimensional physical equations.

Q I'm going to refer you to now and show your counsel what's been marked Exhibit 4, which I am going to suggest is a page from your Web site, but I ask you to look at and confirm.

A This is a printout from my Web site.

Q Under "Geometry Pages," it lists a broad variety of shapes and projects, it seems like, in an area of study and interest of yours. If I didn't describe that list very well, please describe it better and accurately.

A I think that's a fine description.

Q Okay.

A I've done a lot of geometrical projects, especially making three-dimensional physical models.

I've taken pictures of them and described in various details, and this is a link to them.

Q In teaching these issues, is it correct to say you haven't used the small, high-powered magnets in the classroom to teach construction of any of these models?

A I don't understand.

Q I thought that I just heard you say that the magnet is something that you've thought about but haven't used in a courtroom.

A That's right.

Q And so I just wanted confirmation that the practical application of that answer is all of these "Geometry Pages" involve models but don't involve the use of magnets to make them; is that right?

A That's right.

Q Okay. Referring to Exhibit 5, which is your report -- Mr. Qu, hello.

MR. QU: Hello.

MR. JAPHA: Let the record reflect that Mr. Qu now joins us, program already in progress.

BY MR. ARAGON:

A Right.

Q And you could get more detailed, as you said you could raise specific pedagogical ideas. But what I want to ask for now, just so we can limit as appropriate, are your opinions bounded by the subjects you identify here in Exhibit 5, which is your report?

A Bounded?

Q Yeah. Are there opinions that you wish to offer that are not addressed in general or at all in this report that are based on your professional expertise or experience?

A No, I didn't mention this -- I actually did say this; right? The thing I was going to say is that no, I think there's potential for using these as a research tool for studying or developing ideas in discrete geometry.

Q And I guess really what I'm asking is, so we could become very detailed about it, and perhaps you have a lot of ideas, but is your opinion bounded by that statement, that is, the potential pedagogical use of high-powered, rare-earth magnets

projects that don't have -- that aren't specifically related to magnets. That's the reason. It's only been two years since I started playing with them in any significant fashion.

The thing is, as far as publishing, we're talking about publishing in math education. The field is pretty crowded. I haven't really written anything formally on that for publication yet. I've got notes in the works, but the basic reason is that I've been focusing on other things.

Q And when comparing the use of magnets to explain shapes and how certain things -- how shapes come together and the different complex shapes that we've discussed or that you've discussed so far in your testimony, can you compare magnets to these other materials, Zome, which apparently is a major one, straw, paper, other things that you make shapes from?

A I would compare it more closely to paper probably, just because of the forms that I've sort of discovered. Paper, because you can make these polyhedral forms, but also -- I would also compare

it to something like clay, because it is workable like clay, but it's not quite the same as clay because it's granular. It's physically -- I mean, it's visibly granular.

So this is one of the reasons why you can make these shapes with very discrete, particular locations, for example, the 60-ball rhombicosidodecahedron.

Q What I want to ask, then, is, as a tool compared to these other materials, are the magnet spheres better, worse, the same as?

A Well, I don't know, because I haven't used them yet.

Q Okay.

A I know that paper -- like when I use paper to instruct students on making polyhedral shapes, it's sort of cumbersome, because using paper involves a lot of cutting and scoring and gluing, and that's time-consuming.

So an advantage that I see of using magnet spheres, at least for a small desk, is that you can put together some nice shapes pretty quickly after