UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

VALENCELL, INC.,
Patent Owner.

Case IPR2017-00315
Patent 8,929,965 B2

Record of Oral Hearing
Held: February 27, 2018

Before BRIAN J. McNAMARA, JAMES B. ARPIN, and SHEILA F. McSHANE, *Administrative Patent Judges.*

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The above-entitled matter came on for hearing on Tuesday, February 27, 2018, commencing at 11:00 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 McNAMARA: Good morning everybody. Today we are going to hear argument in several cases. Each argument will have a separate transcript. We will begin this morning with IPR2017-00315 and then we'll take a short break to allow the parties to set up and maybe change transcripts. And then we'll have a consolidated hearing in IPR 2017-00319 and 00321. Then we will break for lunch and this afternoon we will have a consolidated hearing in IPR2017-00317 and 318.

At each hearing the petitioner will present its case on all issues first. That will be its case in chief. Any remarks concerning motions to amend, motions to exclude or any other issues. We will then hear opposition from the patent owner, and then the petitioner will have a period of rebuttal for whatever amount of time it has reserved for rebuttal.

For the first hearing, the IPR2017-00315, each side will receive a total of 20 minutes of argument time. For the second hearing, IPR2017-00319/321, each side will have a total of 40 minutes argument time. And then for the afternoon hearings, each side will have a total of 60 minutes argument time.

I would request that the parties not interrupt with objections and save any comments that you have for the next opportunity you have to address the Board.

Okay. Also, I wanted to remind you that Judge Arpin is participating from our Denver facility, and so please speak clearly, identify any demonstratives you may be referring to and speak from the podium so

that we can be sure that the information and sound is transmitted to Judge Arpin.

Could I begin with the petitioner and have counsel please introduce themselves.

MR. PICKARD: Good morning. Byron Pickard on behalf of petitioners. With me today is Michael Specht, lead counsel, as well as Michelle Holoubek, backup counsel. And Mr. Mark Consilvio will be assisting at counsel table today.

JUDGE McNAMARA: And for patent owner.

MR. KIMBLE: Yes, Your Honor. Can I address you from here?

JUDGE McNAMARA: Why don't you go to the podium just to make sure.

MR. KIMBLE: I'm Justin Kimble, lead counsel for patent owner. With me are backup counsel, Jeff Bragalone, Jon Rastegar, Bill Kennedy and also Scott Rhoades. Scott Rhoades is going to be addressing the alternative motions to amend for patent owner. And then also with us is client representative Dr. Steven LeBoeuf, who is one of the inventors on the patents today and also the president of Valencell. Thank you, Your Honor.

JUDGE McNAMARA: Well, welcome to the Patent Trial and Appeal Board. As I said, we will begin with IPR2017-00315. So please proceed, and let me know, counsel, if you have any time you want to reserve for rebuttal.

MR. PICKARD: Yes, we would like to reserve five minutes for rebuttal.

JUDGE McNAMARA: So I will set your timer to 15 minutes. Please proceed when you are ready.

MR. PICKARD: Thank you. May it please the Board, the patents that are at issue today cover a well-known, in many instances, decades-old technologies. And the result of that is that -- which are broadly claimed by the patents. And the upshot of that is it has put the patent owner in a very difficult position that has forced them to take some rather extreme positions with respect to the prior art.

And if we turn to petitioner's slide 9, I would like to highlight one of those, an example of one such instance where the patent owner has been forced to take an extreme position. And there are essentially three fundamental issues in dispute on the Numaga grounds. I would like to talk about the first two today. Patent owner has disputed whether Numaga, in fact, discloses the claimed light guides of claims 1 and 12 in the patents. And it does so despite the fact that Numaga's express language recites light guide parts 21b and 22b.

And if we look at petitioner's slide 13, we get a sense of what the patent owner's argument is. It is the patent owner's argument, as I understand it, that these light guide parts cannot be light guides within the meaning of the patent because they do not transmit light on a single path. There's no path at all, in their view.

And if we look at -- I'm sorry, slide 11. This is from -- on the left is a picture from the Pollonini declaration. On the right is the patent owner's response. I'll just highlight for the Board's benefit here that what's shown on the right doesn't match the evidence on the left. The patent owner has taken the Pollonini annotated figure and exaggerated it. We see here more light paths and more extremely distributed light paths. But if we look at Pollonini, it appears to be the case that what patent owner says is because we

don't have a tightly focused transmission of light, then that cannot be a light guide.

JUDGE McNAMARA: Counsel, may I ask you a quick question about light guides. Do light guides only refer to transmitting of light or does it also refer to light that's being directed on a path that's being received?

MR. PICKARD: I think if you look at the patent, all it requires is that you have -- it's a material that transmits light from the light emitter to the skin. The claims require it be directly. I don't believe there's any argument in this case that the prior art fails to disclose the direct portion of that limitation.

If I may go back to this, what the patent owner's argument essentially is here is that in the absence of some kind of housing or shielding material, the light guide part 21b wouldn't be sufficiently focused. The problem with that argument, as we look at the patent specification -- this is at column 37 of the patent, line 16 to 20. And we cite this in our reply at a page 8. And the patent says, it gives the example of the light guide embodiment that has clouding around it. And not only is there clouding around it in the same way that Numaga has the housing, but it's for the same purpose at least as patent owner understands Numaga. And we see here light guide 119 may be surrounded or partially surrounded by cloudy material 121. And then it goes on to say that is configured to block light from an external source from entering the light guide 119 and/or at least partially confine the light within the light guide.

So the patent itself describes examples where some kind of housing or clouding is required. And it does so for the very same reason that they criticize the need for housing in Numaga.

JUDGE McNAMARA: Let me go back to the previous screen that you were on, the previous demonstrative.

MR. PICKARD: Demonstrative 11.

JUDGE McNAMARA: Yes. And in that case, the one from the Pollonini declaration does show at the bottom light being -- not so much being directed straight along the path at the bottom of the light transmitting device. How do you respond to that? Is there a light guide only in the part of it and then it distributes further out or is there something different?

MR. PICKARD: If we can actually put up -- what's shown in slide 11 is Figure 2 of Numaga. That's not what we relied on in our obviousness combination. There's a separate figure, Figure 1, which I'll put up for Your Honors. That's at petitioner slide 10. And the figure of Numaga is a little unclear, but that curved element 21b, that is the light guide that we've called out there. And then I want to address this notion of where I think you are talking about, that cone-shaped beam of light that they have annotated?

JUDGE McNAMARA: That's correct. And the Pollonini declaration there at the bottom of the curved part, the light appears to be --

MR. PICKARD: So what I think is a helpful comparison here is if we look at petitioner's slide 13. And if it's possible, it would be helpful to put up petitioner's slide 11 as well, but I want to focus first on petitioner's slide 13. And what's on the left side of this is a diagram that the patent owner has argued as illustrating their invention. And what we see there is essentially what's in Numaga. There's this light-emitting element E, this orange rectangle. There's the light guide which is that lightly shaded rectangle down there. And we see below it a cone-shaped beam of light that delivers the light in the emitter to the skin of the subject in that cone-shaped

pattern. If we look back at the Pollonini annotated figure that's shown in petitioner's slide 11, we see essentially the same thing, a light emitter at 21a, the light traverses the light guide part 21b, and we see a same cone-shaped array of light reaching the skin of the subject. The only difference is that we have a slightly wider field of view or cone-shaped pathway of light. But the patent, we now know from the substitute claims, they don't limit the field of view and the existing claims of the patent. There's nothing in the claims to do that. So we submit that Numaga expressly teaches consistent with the meaning of claim terms the claimed light guides of claims 1 and 12.

I would like to turn to the second primary issue with the Numaga grounds, and that is whether the Numaga reference teaches that there's a distal free end. And here we have a claim construction issue. If we could go back to slide 9 just to reorient the Board here, this touches on independent claim 12. And I think there's two facets to the claim construction that the patent owner is arguing for here. One is the distal free end. Distal must mean the remote tip or the distal-most tip, and we'll talk about that when we visit the Fraden reference. But I think for relevant purposes here, they want to import into the claim the requirement that there be some unencumbered portion of the light guide. We think that the Board's construction is appropriate. But it does not need to resolve that issue, because even if we accept the patent owner's construction here, Numaga teaches an unencumbered light guide.

If we could turn to petitioner's slide 15, and we see in Figure 1 is of Numaga the light guide 21b and 22b, the ends of those are unencumbered. They are exposed. And not only that, they protrude sufficiently, but they actually depress the wrist of the subject. This is a wrist-worn device. And

we see that in the description of Numaga at paragraph 9 where it talks about the light-emitting surface 21s, that's the outer edge of 21b. And it goes on and says, And the light-receiving surface 22s are exposed to the sensor's exteriors. That is, they are unencumbered. And the periphery of the tips of the light-emitting device 21 and the light-receiving device 22 protrude. They are entirely unencumbered by the adjacent housing, if you will. So we submit, of course, that Numaga teaches the distal free end limitation under any construction that's at play in this case.

I would like to jump ahead to the Fraden grounds and deal again with the notion of the distal end and the distal free end, the primary argument that petitioner has raised on Fraden. Just to look at petitioner's slide 28, just to remind the panel of what Fraden looks like, what's shown here is a light guide which is this orange hashed section. This is the portion of the light guide that collects light and delivers it to the detector. It's the patent owner's argument that that can't be the claimed light guide because it doesn't reside on the distal end. And as the Board is aware, we have three ringed ribs 84 here. And even if we accept the notion that the distal free end has to be the tip-most or the remote-most portion of this device, we have a rib at the very end of Fraden's ear plug.

They make the secondary argument that it can't be a light guide because it doesn't engage with the subject. They, I think, are pointing to the distance between the very bottom of what's shown as the ear canal and the very end of the distal tip. The problem with that is it ignores all of the contact points these ribs have with the ear canal. The claims don't specify how we measure engagement with respect to any given body part.

In the patent specification, if we look at column 36 of the patent, there's a construction of that that the Board has adopted. This is at column 36, lines 16 to 20. And although the claims use the word "engage," the patent describes the fact that the word "engage" has a very broad meaning. And it says that, starting at line 16, as used herein the term "engage" is intended to mean that the distal end surface 119c may contact the skin of a person or may be closely adjacent to the skin of a person such as within 100 microns to 3 or more millimeters.

So despite the fact that we show actual contact of the figures of Fraden's ribs 84, even if we were to measure it to the end of the ear canal, that would be within the 3 or more millimeters that the patent describes.

JUDGE McNAMARA: So is it your contention that the ribs themselves constitute distal free end?

MR. PICKARD: We do. If we look at that innermost or the endmost rib that resides on the distal end, even as the patent owner points it out, it's that portion of Fraden collects light and delivers it back to a light detector.

I would like to touch briefly on the secondary indicia arguments that the patent owner has raised. They put forth very thin testing data to support the notion of unexpected results. They essentially have three test subjects. Setting aside whether that's a sufficient amount of data to draw any conclusions, a couple of points, I think, bear mentioning. The unexpected result here, in patent owner's view, results from the fact that the light guides are in contact with the subject. But if you look at the case law *Kennametal* in order to have secondary indicia nonobviousness, the thing they point to, the claimed feature that generates the unexpected results has to be a novel

one. And that's not novel. That's taught in Numaga. They have not argued that Numaga lacks that feature.

And with that, I would like to turn briefly with my remaining time to the motion to amend. We've pointed out in our opposition a number of problems with the patent owner's claims. I want to touch first on the indefiniteness of them. They have added these limitations of the relative notion of widening and narrowing the field of view, and it is our position, of course, that that's an indefinite recitation. And I think if we look back at the language of *Nautilus versus Biosig*, we see there patent claims need to serve an important public notice function, and by having claim language that talks about using a flat surface to narrow the field or to widen the field, the problem is the skilled artisan can't look at that limitation and understand as compared to what. When we look at the language of *Nautilus*, the patent must be precise enough to afford clear notice of what is claimed thereby apprising the public of what is still open to them. Otherwise there would be a zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement of claims. And here we have that.

JUDGE ARPIN: Counselor, are we bound by *Nautilus* here or are we bound by *Packard*? These are substitute claims. They would be reviewed under the broadest reasonable construction standard. What is the case law that we have to rely on here?

MR. PICKARD: I think *Nautilus* does control here. We start first with construing the claims, BRI would apply. Then we look at that under the BRI, would the public be fairly on notice of what is claimed and how would the skilled artisan, if they wanted to do experimentation or enter the

marketplace, how could they with reasonable certainty know they were avoiding the scope of the claims.

In addition to the indefiniteness issues, we do have prior art that teaches all of the claim limitations. The Numaga plus Haisley and then Numaga by itself, there's no argument in this case that either of those combinations fail to teach the elements. Instead we have a swear behind from the inventor.

And I want to point out in addition to the testimonial problems, if we look at the claim charts that the inventor has put in, I just want to highlight a few things. It's their burden to show that this actual reduction to practice that they allege exists. They have got to show that all of the claim limits are present. And if we were to turn to Exhibit 2144, in particular page 3, we see a very lengthy recitation of claim limitations, including the notion that there is a narrowing field of view. If we look to the right, we see three conclusory annotations. You can't discern, I submit, from that picture whether we have a substantially flat face surface, and we have no indication about what the field of view of that light emitter, if it be such, would be. If we turn to the bottom of that cell at page 4 from Exhibit 2144, we see, in fact, that it doesn't appear to be a flat face surface, but it appears to be a curved surface.

And I'm into my rebuttal time. There are similar conclusory problems with the claim charts for the other prototype that they have pointed to as an actual reduction to practice. The bottom line is that the patent owner just hasn't made out their case to do a sufficient swear behind to get behind the Numaga and Haisley reference, and they cannot overcome that unpatentability showing.

JUDGE McNAMARA: Two quick questions for you. First, does it matter whether we apply -- to get to the same result or a different result if we apply *Nautilus* or *Packard*?

MR. PICKARD: You get to the same place. And the problem is fundamentally that it's a comparative claim. We cite to Dr. Pollonini's testimony in our opposition. It's at page 125 of his deposition. He agrees that in order to know whether we have a narrowing or widening field of view, you have to have a point of comparison. The patent doesn't describe what that point of comparison would be. Nor do the claims recite one.

JUDGE McNAMARA: And one other question. There's an argument on the motion to amend that Numaga doesn't disclose a substantially flat-faced surface which is, I believe, the limitation that's being added into the motion into the substitute claim, because it has a protrusion. And do you want to respond to that?

MR. PICKARD: That's taught by Haisley. Haisley teaches that there was a known problem that protrusions could irritate or harm the skin of the subject, and so it offered a way to solve that problem by having a non-protruding flat-faced light guide parts, emitters and collectors.

JUDGE McNAMARA: Okay. That sounds great. Thank you very much. I'll give you a little bit extra time. You'll have four minutes on your rebuttal.

MR. KIMBLE: Your Honors, we have courtesy copies, hard copies of the demonstratives, if you would like them.

JUDGE McNAMARA: Please, yeah, bring them up. And the court reporter has a copy of them; is that right?

MR. KIMBLE: Yes, Your Honor. May it please the Court, Your Honors, I intend to reserve eight minutes of rebuttal -- or of time for my co-counsel to address the motions to amend.

JUDGE McNAMARA: You have 20 minutes. You can use them any way you want. Just keep an eye on the clock.

MR. KIMBLE: Thank you, Honor. All right, there's several primary reasons why patent owner wins in this case. The first is that Numaga doesn't disclose the light guide as that term has been construed by the Board and as required by both independent claims. The second is that Numaga doesn't disclose a distal free end as required by claim 12. The third is that Fraden does not disclose a second light guide with a distal end or a distal free end, for that matter, that's configured to engage the body of the subject. The last part of that is what's important, configured to engage the body of the subject.

Also, I don't think we'll get to these, but we also believe that petitioners's combinations improperly use the claims as a roadmap to combine the references, indicating hindsight bias. And finally, we do believe that the secondary considerations, the evidence we've presented of unexpected results is sufficient and would, to the extent that there was a determination of obviousness, be sufficient to overcome that obviousness finding.

Okay. I want to start with the secondary considerations, actually. And just briefly, Valencell is a company founded in 2006 by three Ph.D. electrical engineers. Their technology has won numerous awards. This is in the record, has been licensed repeatedly. That's in the record. What I want to focus on today is some of the -- it is a particular aspect of their

inventiveness as relates to the '965 patent. And what that is is that the bête noire, really, of this health monitoring is noise and how to deal with noise. And people have been trying to deal with noise for a long time. However -- and this is reflected in the record. This is reflected in petitioner's exhibits, Exhibit 2011. And they talk about how to deal with it is to just bring more light. If you get more light, you'll get more -- you'll get noise but you'll get more light back, more data. And that was the approach before the '965 patent. And that's described in Exhibit 2011, as described on slide -- I'm on slide, sorry for Judge Arpin, slide 4.

Now, Valencell did something different. Now I'm on slide 5. What they did is they said we are going to focus, we are going to deliver light to a particular part of the body. We are going to deliver less light, but we are going to deliver it to specific parts of the body and thereby minimize the signal-to-noise ratio. That's the goal, minimizing the signal-to-noise ratio. And we have a depiction here on slide 5 that shows how they did that. And so on the left we have these light guides depicted, and what you see is that less light is delivered to the body and less light is received.

And that's contrary to thinking, well, if I'm getting less light back, how is this thing going to work better? Well, in fact, Valencell did some tests which they have authenticated and which our experts opined about that shows that this was unexpected but in fact, did improve signal-to-noise ratio. We tested two devices or Valencell tested two devices, one of which did not have the light guides configured to engage the body.

I'm on slide now 6. And it is SM2, as we call it for simplicity, on the right side of those two figures. And that's SM2 looks a little bit like Figure 24A from the '965 patent.

So what the tests showed was first -- now I'm on slide 7. So they showed the vast majority of light is noise. So again, this is the problem. They also demonstrated that using the light guide on the emitter reduced the light leaving the sensor. Less light left the sensor. In addition, less light was received or less light -- sorry. In the first instance less light left the emitter. Less light was also received by the detector, both in terms of total light, DC, but also in terms of AC, which is the good light, if you will. However, notwithstanding the fact that less light was received, the signal-to-noise ratio, the AC over DC, was better.

And so this was one of the things that Valencell figured out and that is depicted in the '965 patent, and in particular, with the claim limitations about light guides being configured to engage the body of the subject. So again, this was contrary to thinking at the time.

JUDGE McNAMARA: I think I asked this question of petitioner's counsel as well. Light guides, is a light guide only on the transmitting side or is it on the receiving side as well?

MR. KIMBLE: Both.

JUDGE McNAMARA: Okay. And so as I recall, on, I think it's around page 19 of your patent owner response, you referred to the light shielding tube 26 which is to ensure that light from emitting device 21 is not incident on the light receiving device 22. Why isn't that shielding tube 26 a light guide?

MR. KIMBLE: So I'll move forward to slide -- I think my slide 9 depicts this. You are looking at Numaga, and in particular Figure 2; is that right, Your Honor?

JUDGE McNAMARA: That's correct.

MR. KIMBLE: So this is interesting. So first of all, my understanding has not been that Apple has contended that that particular component discloses the light guide in this case. Now, it is true, I think, that Numaga describes that a problem with this was that light would escape the light emitter because it's escaping in all directions, not along a path, and some of it would enter that tube. So I think it may be. I'm considering this as I sit here, but it may be that that could potentially be described a light guide or having some sort of a function like that. Again, that's not my understanding of what the argument has been.

JUDGE McNAMARA: I understand that, but I'm looking at that and I'm very curious as to why that's not a light guide the way we've construed the term.

MR. KIMBLE: Yes, sir. Your Honor, so there's two -- they are depicted in white there. There's two layers, right, and you're looking at the second one up, am I correct?

JUDGE McNAMARA: I'm looking at your patent owner response which refers to light shielding tube 26, and I'm trying to figure out why light shielding tube 26 is not a light guide.

MR. KIMBLE: The reason I asked for that clarification, Your Honor, is because that shielding tube is not engaging the body. So to the extent that that -- it may be a light guide, but it's not the claimed light guide.

JUDGE McNAMARA: All right. That's what I wanted to know. Thank you.

MR. KIMBLE: So moving on, I alluded to this a minute ago, these light emitters, and that's what they are called, they are light emitters, they emit light in all directions. I'm going to move on to slide 10. And our

expert confirms this, that these are essentially LEDs. Numaga says that these parts are to protect the emitter. They are not there to guide light. They are housing really. So there's no effect of taking the light from the emitter to the body. They are just around it and light goes in all directions. And that just doesn't meet the Board's construction.

JUDGE McNAMARA: Well, let me ask you another question about that. Even if the function that's disclosed is to protect the device, doesn't the fact that the device is surrounded by the housing guide the light in a particular direction unless it were a transparent housing?

MR. KIMBLE: So I think there is a distinction. I think that the light guide part, the one that Apple has contended throughout as the light guide, doesn't direct light along the path. I think what Your Honor is asking is, well, what about some of the other components. So that hasn't been the argument, that the surrounding material acts as the light guide. And so we think that Apple is limited to the contention that the part 21b that is the light guide.

JUDGE ARPIN: Counsel, referring to your slide 10, is that really accurate? You have lines of the red arrows going into, I think it's called the shell device, support member 27? Is that really accurate? Does it really go into those?

MR. KIMBLE: Your Honor, that's a fair question. The intention wasn't to show that light goes into those but just that light emits in all directions, that the light guide part is not directing light along a path. This is in contrast to, for example, if you look back -- and there was a comment about this from petitioner. If you look back on our depiction on slide 5, the light guide -- so I'm looking at the left of the depiction. The light guides that

we show under the '965 invention, they are directing light from the emitter down through the light guide. That's purposeful, and that's what the patent is talking about. The Numaga reference is doing no such thing. It just lets light spread wherever in terms of the part itself.

I'm going to move on to distal free end briefly. So patent owner does --

JUDGE ARPIN: Counsel, before you do that, is the light guide and the distal free end, are those the only claim construction terms remaining in dispute? There were other terms that we proposed constructions for and petitioner proposed constructions for in the DI, but are the only remaining claim construction issues those two terms?

MR. KIMBLE: I believe that's right. In fact, light guide I didn't think of as in dispute. But distal free end certainly is.

JUDGE ARPIN: Thank you very much, counsel. Please continue.

MR. KIMBLE: So distal free end, we do think that the Board's preliminary construction was incorrect. We think that distal free end has to mean something different than just distal end. It has to be more than just the end opposite the proximal end. The two examples that the patent gives of this -- I'm on slide 13 -- are in Figure 26 and 31 of the '965 patent. And here this free end surface is unencumbered, unfettered from the base. It's free. We think that that meeting needs to be reflected in the construction of the term "distal free end."

Now, the Board did preliminarily find the distal free end was an end opposite to the proximal end of a light guide that may be used with many different parts of the body. Our trouble with that is, respectfully, that we don't believe that that provides a meaningful -- well, there's two things.

One is a meaningful distinction from the distal end. I don't know what in the patent would suggest that the distal end couldn't be used with different parts of the body. And secondly, it imports functional language which would hold no weight and would further make the distinction between distal end and distal free end essentially -- there would be no difference. We think this is important that the free represent a physical difference.

That said -- well, before I get to that, so under our construction, we think it's clear that Numaga doesn't have a distal free end, that the tips of those are not unencumbered, unfettered by the base.

JUDGE McNAMARA: What is the construction you are currently proposing?

MR. KIMBLE: So I'm firstly saying under our proposed construction we don't think that Numaga's tips are a distal free end.

JUDGE McNAMARA: But that's not my question. My question is what is your current proposed construction?

MR. KIMBLE: It is an end opposite the proximal end of a light guide that is unencumbered or unfettered by the base.

JUDGE McNAMARA: And what does unencumbered or unfettered by the base mean?

MR. KIMBLE: Well, that's another way of saying that it's free, that it's not surrounded by the base.

JUDGE McNAMARA: Let me interrupt you again. Free is unencumbered, and then to tell me unencumbered means free doesn't help. What I'm trying to find out is what you mean by unencumbered.

MR. KIMBLE: Yes, Your Honor. I think I can answer the question by looking to Numaga. So Numaga, the base is surrounding the

proposed light guides. The distal free end is not -- it is encumbered. And what I mean is not that. It has to be --

JUDGE McNAMARA: You understand my problem here? We have this term called "distal free end," and the issue appears to be free and what does it mean to be free. And it doesn't help for you to say to me, well, let's look at the potentially invalidating reference and let's construe it to mean not that. So what I need for you to help me with in terms of the construction of the term is how do I construe the term "free" in the context of the '965 patent that we are talking about?

MR. KIMBLE: Yes, Your Honor. I am trying to answer you. We do think that unencumbered and unfettered by the base describes that. Unencumbered, you know, means -- I'm trying to think of a synonym for that now, but surrounded. Unencumbered is not. Okay. And so you look at some examples in our patents where there's a distal end, and it's flush with the base. The distal free end is not that --

JUDGE ARPIN: Counselor, a definition of unencumbered is not having any burden or impediment. Is that what you mean?

MR. KIMBLE: I think that that -- yes, I think that's fair. And Your Honors, I just want to say I'm concerned about time. I'm at five minutes now and I do need to leave time for the motion to amend.

JUDGE McNAMARA: Feel free to use it any way you want. If you want to move on to the motion to amend, move on to the motion to amend.

MR. KIMBLE: I'll be very, very quick. Even under the Board's preliminary construction, we don't think that Numaga discloses a device that

can be used with many different parts of the body. So that's in our papers, but I want to make that quick point.

And lastly, I would just say, I think this is in our papers, with respect to Fraden, we don't think that the ribs that are on the side of the plug are the distal free end or the distal end. They are not at the proximal end -- I mean, they are not at the end opposite the proximal end.

JUDGE McNAMARA: And that's discussed in your papers?

MR. KIMBLE: That's discussed in the papers. So I am now going to turn it over to co-counsel.

JUDGE McNAMARA: Thank you very much.

MR. RHOADES: May it please the Court, my name is Scott Rhoades. I represent Valencell, Inc. I am addressing the motions to amend today. Specifically, I'm starting with the motion to amend in the IPR ending in 315.

I would like to quickly address one of the issues that was raised by petitioner regarding the narrowing. I want to point that in petitioner's opposition to our motion to amend their own expert states that a person of ordinary skill in the art would have understood that a solid angle of light emission of an optical interface that has a flat surface is inherently narrower than a solid angle of light emission of an optical interface that has a convex surface. Your Honor, I believe that is exactly the point. Narrowing, widening is understood by their own expert. Therefore, we believe that the claim terms as used in the claims are sufficient.

The substitute claim 13 which is a substitute for claim 1 just added a substantially flat-faced surface narrowing the field of view of the first light guide.

If you look at slide number 4, this is the amendments to claim 24, a substitute for claim 12. And it talks about a substantially curved surface widening a field of view of the first light guide and an exposed end surface that are both configured to protrude beyond the housing. Your Honor, we wrote this claim in an attempt to kind of expand upon the prior claim 12 and show that the distal free end having a substantially curved surface and the exposed end are both extending beyond the body and both protrude into the body of the device and both protrude into the subject.

JUDGE McNAMARA: So this claim wouldn't be -- the substitute claim then wouldn't be drawn to advice where it was just literally flat against the housing?

MR. RHOADES: That's correct. If you would please go to slide 13, I'm going to go deal with quickly -- actually, go to slide 14. This is the swear behind argument. Haisley was filed December 16, 2011. In September of 2010, Valencell reduced to practice the Ork Tilt C, and in February of 2011 they reduced to practice the Tribork.

If you would please go to slide 18, patent owner has provided evidence of the elements that were used to create the prototype. We have testimony that it was actually constructed on that date, and we have testimony from an inventor and a former employee, non-inventor, who was actually the test subject who wore the devices, both the Ork Tilt C and the Tribork, and has testified that they both -- that they worked and that at the time the inventors and the people doing the testing described them how it worked for its intended purpose.

I also think it's important to note that Dr. LeBoeuf provided testimony that each and every claim element was present -- of the substitute

claim 13 is present in the Ork Tilt C and the Tribork and that he attached a file of test data in which he explained that that test data showed that it worked.

It's also important to note --

JUDGE McNAMARA: I'm sorry to interrupt. The subjects that were wearing the devices, though, did not really know whether or not they complied --

MR. RHOADES: That's correct. He did not look at test data.

I do want to point out that petitioner has provided no evidence to rebut any of those assertions. They provided attorney argument only. They didn't have their expert look at the prototype or the pictures thereof and say this element is missing, this element is here. They just said we can't see it as the attorneys.

JUDGE McNAMARA: Counsel, I'm going to give you another 30 seconds to wrap up.

MR. RHOADES: Certainly. As we discussed, Mr. Paik was a former employee, non-inventor, and he provided testimony that he actually wore the device. There's no doubt that the device actually existed as of that date. And Dr. LeBoeuf has set forth that all the elements of the substantive claim aren't there on that date as well. Again, there was no evidence to contradict that and therefore, we believe that we have successfully sworn behind the Haisley reference as all the dates preceded that. Mr. Paik's --

JUDGE McNAMARA: Thanks, counsel.

Counsel, I know it took the -- you have four minutes remaining.

MR. PICKARD: I want to turn back to the unexpected results issue. Patent owner has made the argument that their claims, I think, ran

against the grain, and the prevailing wisdom was that delivering more light was better than less light. A few important things to keep in mind. The claims don't recite delivering more or less light as a way of solving the problem, at least not explicitly. And if we look to their evidence for what the prevailing conventional wisdom was, it's a 1988 reference to Mendelson. That's that Exhibit 2011 that we heard about. I think we are dealing with the priority date here or filing date of 2011. So many years have passed between the supposed wisdom of Mendelson to the time of the inventions.

Where the notion of delivering less light to improve the sensitivity comes in on the claims, if at all, is the idea of engaging the body with these sensors. As I said earlier, Numaga does that. I don't think we've heard any dispute on that point. Numaga's tips protrude. They engage with the wrist. And if we look at paragraph 7 of Numaga, it even recognizes that doing so improves the sensitivity of the sensor. And again, under *Kennametal*, they have to point to a feature that is both claimed and novel, and here that feature is taught explicitly by the Numaga reference. So they can't rely on those unexpected results to show nonobviousness.

Lastly, on the claim charts from the inventor, it is the patent owner's burden to establish that they have established an ARTP that embodies all the claim limitations. We submit that if you carefully read the limitations and compare to what's conclusory and pointed out, they don't even in a conclusory fashion highlight each and every limitation of the claims that they are attempting to show or actually reduce to practice before Haisley.

JUDGE McSHANE: Counsel, patent owner has argued that Apple has not argued that the housing is part of the light. Do you agree with that?

MR. PICKARD: I think that's right. We point to light guides 21b and 22b as the light guides. The fact that they are surrounded by the housing is perfectly consistent with the description and the claims in the patent, especially in view of those cladding examples in the patent that I discussed in my opening argument.

Thank you. We ask that all of the instituted grounds, that you find in favor of petitioner and find the claims at issue unpatentable.

JUDGE ARPIN: Counselor, before you sit down, I have a couple more questions. I asked patent owner whether or not the only two claim construction issues in this case are the distal end and the light guide terms. We adopted many of your proposed constructions in the DI. Do you agree with patent owner's counsel that those are the only two terms that remain at issue?

MR. PICKARD: Yes. I don't think that there's actual dispute over the meaning of light guide in terms of claim construction. They haven't argued it that way. Perhaps there's some underlying dispute there, but that's the only two possible claim construction issues that I'm aware of.

JUDGE ARPIN: The second question I had, I think during your primary presentation you talked a little bit about the lack of test subjects with regard to the swearing behind arguments; is that correct?

MR. PICKARD: I may have mentioned that, yes.

JUDGE ARPIN: Do you agree that one corroborating witness to the successful operation of the device would be enough?

MR. PICKARD: I'll answer your question, but I do want to make one point of clarification. My mention of the lack of test subjects, that was

in regard to the test data for the unexpected results. I think you are asking about the corroboration on the swear behind?

JUDGE ARPIN: Yes.

MR. PICKARD: There are instances, cases where a single corroborating witness can be sufficient. This case is not one of those instances. There are some serious problems with Mr. Paik's testimony. There are credibility issues. He remains a shareholder in the company. He's uncertain about which devices he was wearing for given testing. He has no direct knowledge about the internal workings or structures of the devices that he wore while being tested. He can't validate that the thing that's shown in those claim charts was, in fact, the thing that he wore during a given test that showed a successful operating prototype.

JUDGE ARPIN: Thank you very much, counsel.

JUDGE McNAMARA: Thank you very much. That concludes our hearing in IPR2017-00315. We will take a short five-minute recess to allow the parties to set up for the next case and then we will move on to IPR2017-00319 and 00312 as a consolidated hearing.

(Whereupon, the proceedings at 11:47 a.m., were concluded.)

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