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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ATHANASIOS KATSAMANIS, SHRIKANTH NARAYANAN and ALEXANDROS POTAMIANOS

Appeal 2022-000846
Application 16/441,521
Technology Center 2600

Oral Hearing Held: June 23, 2022

Before JASON V. MORGAN, JEREMY J. CURCURI, and HUNG H. BUI, *Administrative Patent Judges.*

APPEARANCES:

ON BEHALF OF THE APPELLANT:

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The above-entitled matter came on for hearing on Thursday, June 23, 2022, commencing at 2:11 p.m., at the U.S. Patent and Trademark Office, by video, before Chris Hofer, Notary Public.

P R O C E E D I N G S

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THE USHER: Calendar No. 4, appeal No. 2022-000846, attorney Robin Rohlicek.

JUDGE BUI: Good afternoon.

MR. ROHLICEK: Good afternoon. So may it please the Board. My name is Jan Robin Rohlicek on behalf of our client Behavioral Signal Technologies I want to thank you for the opportunity to present the invention and the reasons we think that it's patentable. So Behavioral Signal Technologies --

JUDGE MORGAN: Before you begin, counselor, Judge Bui has just a few housekeeping things before you pick up your time. I know you're anxious.

JUDGE BUI: Okay. But nevertheless, thank you for your willingness to do this video conference, video hearing today and just a few housekeeping items. First, we want to make sure that your right to be heard is protected here and make sure that you have the opportunity to present all your arguments and if you have any technical problems and any questions regarding the hearing, please let us know. Second, this is -- the second point is really for me and not for you. When not speaking, please mute yourself and please identify yourself each time you speak. That way the court reporter will prepare a more accurate transcript.

Third, we have reviewed the entire record and, you know, if you would like to direct our attention to any particular page,

item or reference please let us know and lastly, please be aware that members of the public might be listening to this oral argument. With that, you have 20 minutes to present your case. Thank you.

MR. ROHLICEK: Very good. So for the record, my name is Jan Robin Rohlicek, 43349 is my reg. number and I'm representing Behavioral Signal Technologies in this appeal. So Behavioral Signal arose out of University of Southern California where one of its founders is still on the electrical engineering faculty and leads one of the labs in signal analysis and signal interpretation.

So this application builds on a long history of research and behavioral profiling and shaping and addresses a very practical application of aiding interactions between parties. An example carried through the specification is interactions between customers and agents and the call center (indiscernible) in a contact center.

So a successful agent can read an interaction with someone else. They hear the person's voice, their emotions, their behavior and they can adapt their responses to achieve a goal. Maybe it's customer satisfaction, maybe it's something quantitative like making sales. But a skilled agent for instance can mollify an agitated customer, talk them down, get them calm and then address the substance of the concern, so how they interact evolves throughout the dialog. But not all can be this

skilled and so this invention it really means to supplement the, you know, less skilled or less experienced agents or in other situations or other parties to give them recommendations on how to interact.

So I want to go jump to sort of what is the main point that I want to cover today and then a very important aspect of this invention is that the interaction is divided into separate communication events. That's a term used in claim 1 and, you know, as an example if you're doing a conversation each turn, the agent speaking, the customer speaking, those would be examples of communication events.

The specific approach that's in the claim requires there are two stages. One is the communication events, for instance the turns in the dialog, and then each of those generates a feature vector, a numerical representation of that event. By the time you get to the conversation you have a sequence of those feature vectors and the second stage of the processing requires processing the sequence of those to give the recommendation. The recommendation might be, you know, it's time to sell, please keep trying to calm the customer down, things like that.

There's other requirements in the claim. For example, there's two neural networks, one neural network does the processing for the events to the features and another neural network does the processing of the features into the recommendation. There's also a requirement that the feature

vectors include behavioral profile indicators stems from the research in the behavioral profiling, you know, behavioral profile indicators are things like aggressiveness, engagement, politeness and things like that.

All right. So it's a relatively straightforward claim. The two parts, the processing of the successive events, you make the sequence of feature vectors, you take the sequence of feature vectors and get the recommendation.

So now let's turn to the rejection. It's a 103 rejection. Most of the rejections relies on the primary reference, Raanani. There's one aspect that relies on the secondary reference. So I'm going to focus on the first reference and try to explain why we think there's such a gap between the primary reference and what we're claiming.

So we recognize that this reference, Raanani, it does have a lot of similarities. Looking at conversations it's actually trying to make recommendations on call guidance, so it actually be applied in this call center application. So there is similarities but where the difference is is how the reference processes a conversation. So that's the key. That's what our claim is about and that's where the distinction lies.

So the present invention relies on processing separate events getting the feature vectors for each of those events and then processing them. On the other hand, Raanani processes the conversations as a whole. It takes the whole conversation,

generates various kinds of features of the conversation and doesn't really consider specific events, certainly non-events for instance turns into dialog. So as far as we can see, that kind of thing is completely missing.

So let's go to the claim language as to tie us to what the claim says. There's two parts that I want to focus on. One is that we require that there are successive communication events and those are processed to form respective feature vectors, respective to each of the events, that form a sequence of feature vectors and then later we're going to process that sequence of feature vectors.

So we've raised an issue a number of times about the reference not having these successive communication events and, you know, from our point of view the reference, Raanani, teaches primarily looks at the conversations as a whole. So --

JUDGE MORGAN: Counselor?

MR. ROHLICEK: Yes.

JUDGE MORGAN: This is Judge Morgan. Before diving into, it did seem that the meaning of successive communication events was central to the arguments. Can you point to us where in the specification these successive communication events are defined, if anywhere?

MR. ROHLICEK: Defined. So certainly they are described as -- so we give the example of successive communication events being turns in the dialog, you know, for example, you know,

even in the claims like claim 2, you know, the successive communication events comprise conversational turns. Do I have an explicit definition what a communication event is in the specification? I probably don't have a definition, you now, by communication event I mean, but I think from the context the defense (phonetic) would argue that one would have understood that they are units. The examples we've given are the examples in the specification, are turns in a dialog, entire conversations that you're looking at a sequence of conversations over multiple days. So although I don't believe that there's an explicit definition of communication event means this, I think we have a number of examples that I think should bound what one would have understood that to mean.

JUDGE MORGAN: Just looking at the specification at the bottom of, I believe this is the bottom of page 3 to the top of page 4, it does mention conversational turns in a dialog between multiple parties, separate dialog, separate telephone calls between multiple parties, that they comprise linguistic communication events comprising spoken or textual communications. Just observing that does seem to be a very broad scope of what may be considered a communication event or a successive communication event.

MR. ROHLICEK: So even without definition I would say that the words successive and communication probably can't be ignored. So successive means one following another so, you

know, we at least have that and then it's a communication event in that it has something to do with communication between the parties. So within those plain meanings and within the bounds of the examples, it may be broader than I may be thinking. But on the other hand I believe my arguments will stand even with a broad interpretation of that term.

JUDGE MORGAN: Well, the examiner points to Raanani paragraph 56 which classifies the first two minutes of a conversation. So there is a conversation. There is linguistics going on in there, and also classifies the third minute. I'm looking at the specification.

MR. ROHLICEK: Yes, and --

JUDGE MORGAN: Aren't those successive? The first two minutes followed by the third minute.

MR. ROHLICEK: So I'd say two things to that. One is -- so there's a couple of things to say about the successive and sequence. One is overall, other than like paragraph 38 (audio interference) paragraph 55 Raanani talks about features that are of the conversation as a whole. It's a bag of features.

Then related to the time intervals yes, in paragraph 38 he may talk about minutes one through two, you know, the first two minutes and minute three that happens to follow minutes one through two. Also where he talks about seconds five through twenty and seconds ten through twenty five, they're overlapping. What I would say that these intervals that in general when he

gets features of the entire conversation for certain things he may choose to look at a chunk of time, for instance at the beginning. You know, is the person -- I'm venturing to guess, I'm reading things into it -- but if the person is yelling during the first two minutes it's probably an indication of something's not going right. That's not in my mind looking at a communication event, it's saying I'm going to focus on a piece of the recording. Maybe it's a recorded event but I wouldn't say it is a communication event.

Even if, so suppose you say, well, that's still too broad. Communication can mean anything. We'll ignore the successiveness because even though he's not overlapping and not necessarily one following another, you know, so I think we fail on successive. Communication, we can disagree of whether arbitrary cuts have nothing to do with the communication but does with the recording are communication events. But even if you do that, when you generate these features there's no sequenceness to them; right?

So in our scheme we generate a sequence that -- a set of features that they follow each other. We have a recurrent neural network for example that processes those features. It'll see that perhaps there's an agitated customer who then calms down. You see the trajectory of it, it's inherent in the design.

In the processing in Raanani, even if you generate some features from sub-intervals and even if those sub-intervals

happened to have followed one after another and some not, some overlapping but, you know, so you find two that follow one after another. So there's two in there that happen to be successive sequences of time. I'd make the argument that when you generate the feature vectors from them that's not a sequence, it's still, you know, they are sequence-able. They might be order-able. But they're not in a sequence and certainly the processing isn't of a sequence. You know, we have a step to processing the sequence to get the answer.

We believe that's, you know, quite important and, you know, the inventors came to this recognizing that people have looked at other instances before, I mean, sorry, conversations before, classified entire conversations. This is probably not the only reference that (audio interference). What they came to is realizing we need to watch the sequence.

So I'd argue the three things about Raanani's time intervals are 1) even if two, you know, two examples are successive, other examples are overlapping and not successive, the next being that even if you generate feature vectors for those time intervals you don't end up with a sequence of feature vectors as we require, you end up with a bag, a set, a collection of feature vectors and those are passed to his next stage which gives his on-call recommendation.

So I'd say not only is it missing what we think is the innovative part, its kind of a stretch in our mind to say because

he said, hey, the first two minutes are important, the first ten through twenty five seconds are important, or the first five through twenty seconds are important, maybe they're overlapping, we don't see that as having really recognized the sequence aspect, the successive communication events and the sequencing.

And then if you go to the dependent claims, claims 2 and 3, those same time intervals, those same arbitrary times zero to two minutes, ten seconds, twenty five, are what the rejection is relying on for teaching the successive communication events are turns or successive communication events are, you know, old dialogs, for instance, interactions on Monday and Tuesday and Wednesday being separate communication events because you were watching how the interaction goes from day to day.

So, you know, even if they're successive (audio interference) sequence, even if you get the sequence there's no processing in the sequence and then if you look at the dependent claims we don't see how it's a real stretch in our mind to say, hey, zero to two minutes, three minutes becomes turns in a dialog or separate conversations.

Does that address or any further thoughts on this?

JUDGE MORGAN: I don't have any additional questions.

MR. ROHLICEK: So the sequence and the successive communication events and the lack of successive communication events and the lack of there being a sequence of feature vectors

was really the primary issue that I wanted to address here. You know, Raanani comes from a similar field but just does things differently. You know, there's other issues about whether or not Raanani's features are behavioral profile indicators and so forth and his outputs are things like, you know, you're going to make a sale, you're not going to make a sale and there's some issues about whether or not his features have behavioral profile indicators but you can, you know, that's argued in the briefs and I don't think it's as central as the sequence aspect which I think we can hang our hat on. Really I think that's really the point I'd like to make. It sounds like you had also wanted to address that and so I think I could leave it at that.

JUDGE MORGAN: Thank you. Judge Bui, Judge Curcuri, do you have any questions?

JUDGE CURCURI: I don't have any questions. Thank you, counsel.

JUDGE BUI: Thank you, counsel.

MR. ROHLICEK: All right. Very good. Short and sweet.

JUDGE BUI: Yes. Appreciate it.

MR. ROHLICEK: All right. Very good. Thank you very much.

JUDGE BUI: Have a nice afternoon.

MR. ROHLICEK: Bye bye.

(Whereupon, the proceeding at 2:29 p.m. was concluded.)