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November 11, 2022

Steve Cashman  
President & CEO  
Caption Health, Inc.  
2000 Sierra Point Parkway, Suite 800  
Brisbane, California 94005

Re: Caption Health, Inc.'s Infringement of U.S. Patent No. 11,129,591,  
Assigned to the University of British Columbia

Dear Mr. Cashman:

I am writing to follow up on your June 27, 2022 e-mail in response to a May 5, 2022 letter from my partner, Jeffrey Morton, providing notice to Caption Health of its infringement of U.S. Patent No. 11,129,591 ("the '591 Patent"), which is assigned to the University of British Columbia ("UBC"). Please kindly let us know if Caption Health has since retained counsel in connection with UBC's assertion of the '591 Patent, so that we can communicate directly with counsel.

In your e-mail, you requested "more information ..., such as detailed claim mapping and interpretation in relation to [y]our current products," "[i]n order to have a productive discussion" regarding UBC's assertion of the '591 Patent. Pursuant to your request, please find attached a claim chart detailing how Claim 1 of the '591 Patent reads on Caption Guidance, as evidenced by statements made by Caption Health in U.S. Patent Application Pub. No. 2021/0052253 A1 and in other public forums (e.g., YouTube) regarding Caption Guidance. For convenience of reference, I have attached this published patent application and the '591 Patent again.

Now that we have provided the requested information, we look forward to a productive discussion regarding UBC's assertion of the '591 Patent against Caption Health to see whether this matter may be resolved without resort to litigation. In view of the intervening Thanksgiving holiday, we request your substantive response by December 2, 2022. Thank you.



Sincerely,

A handwritten signature in blue ink that reads "Ray Chan".

Raymond Chan

Enclosure

cc: Steve Cashman ([steve@captionhealth.com](mailto:steve@captionhealth.com))  
Michael Cannon ([mgc@captionhealth.com](mailto:mgc@captionhealth.com))  
Jeffrey D. Morton ([jeffrey.morton@procopio.com](mailto:jeffrey.morton@procopio.com))  
Dave Deonarine ([dave.deonarine@procopio.com](mailto:dave.deonarine@procopio.com))

## Claim 1

P	A computer-implemented system for facilitating echocardiographic image analysis,	<p>To the extent that the preamble is limiting:</p> <ul style="list-style-type: none"> <li>• US 2021/0052253 A1 describes “an ultrasound diagnostics data processing system configured for ultrasound guidance dynamic progression.” ¶ [0026]. This system is used “in connection with the imaging of a heart.” ¶ [0020]; <i>see also</i> Fig. 1 (i.e., target organ 130).</li> <li>• Caption Guidance is “a medical software tool that utilizes Artificial Intelligence (AI) for providing echocardiography.” EMMA International: Caption Guidance – FDA’s First Authorized AI-Based Cardiac Ultrasound Software, by Govind Yatnalkar, Feb. 15, 2021.</li> </ul>
1[a]	the system comprising at least one processor configured to:	<p>Caption Guidance is described in a published U.S. patent application as a system which comprises at least one processor.</p> <p>The system includes a host computing system 210 that includes a computer with at least one processor, memory and a display.</p> <p>US 2021/0052253 A1, Abstract.</p>
1[b]	receive signals representing a first at least one echocardiographic image;	<p>Caption Guidance acquires a video clip comprising a series of echocardiographic images.</p> <p>... an ultrasound imaging system 110 with ultrasound imaging probe 120 conducts an ultrasound imaging operation in order to acquire a video clip as near real-time imagery 155 of a target organ 130.</p> <p>US 2021/0052253 A1, ¶ [0020].</p>

<p>1[c]</p>	<p>associate the first at least one echocardiographic image with a first view category of a plurality of predetermined echocardiographic image view categories;</p>	<p>Caption Guidance associates the first at least one echocardiographic image with a first view category.</p> <p>... an ultrasound guidance dynamic progression method includes selecting a predetermined ultrasound diagnostic workflow in memory of an ultrasound diagnostic computing system, the workflow including <u>a sequence of views</u> of a target organ. The method further includes selecting <u>a first one of the views in the sequence</u> and presenting guidance, such as visual guidance, in a display of the computing system for the selected first one of the views. The method yet further includes acquiring imagery in the computing system <u>in association with</u> the selected first one of the views in the sequence, and ...</p> <p>US 2021/0052253 A1, ¶ [0009] (“Brief Summary of the Invention”) (underlining added).</p> <p>The above first view category is one of a plurality of predetermined echocardiographic image view categories.</p> <p>In conducting the ultrasound imaging operation, a workflow 175 of the target organ 130 is selected that includes <u>a sequence of views 135A, 135B, 135N</u>. For example, in connection with the imaging of a heart, the views 135A, 135B, 135N may include a parasternal long axis view, a parasternal short axis view, an apical two, three, four or five chamber view or a subcoastal view, ...</p> <p>US 2021/0052253 A1, ¶ [0020] (underlining added).</p>
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<p>1[d]</p>	<p>determine, based on the first at least one echocardiographic image and the first view category, a first quality assessment value representing a view category specific quality assessment of the first at least one echocardiographic image;</p>	<p>Caption Guidance determines a first quality assessment value representing a <u>view category specific</u> quality assessment of the first at least one echocardiographic image.</p> <p>A quality meter 150 is disposed in the user interface 140 and indicates a sliding scale of quality of the imagery 155 in the contemporaneous display 160A <u>relative to a known view</u> sought to be acquired for the target organ 130. To the extent that the imagery 155 is determined to have a corresponding quality value that meets or exceeds a threshold quality <u>for the specified view</u>, a success icon 165 is displayed in connection with the quality meter 150.</p> <p>US 2021/0052253 A1, ¶ [0022] (underlining added); Fig. 1.</p>
<p>1[e]</p>	<p>produce signals representing the first quality assessment value for causing the first quality assessment value to be associated with the first at least one echocardiographic image;</p>	<p>Please see Element 1[d] above.</p> <p>Caption Guidance automatically captures the first at least one echocardiographic image and associates it with the first quality assessment value.</p> <p>In a presentation titled <u>Caption Health: Flattening the Ultrasound Learning Curve with Breakthrough AI-Guided Echocardiography System</u>, Ha Hong, Ph.D., a founding team member of Caption Health, the machine learning lead of Caption Guidance, and an inventor listed on the published patent application, described the system as follows:</p> <p>Finally, [it] recognizes when the user reaches the target and automatically captures the images in diagnostic quality.</p> <p><a href="https://www.youtube.com/watch?v=NCFFAIHSPrc">https://www.youtube.com/watch?v=NCFFAIHSPrc</a> (at 4:30-4:40).</p> <p>In Caption AI Product Demo   AI-Guided Ultrasound System:</p> <p>As Sarah gets closer to the optimal view, the meter rises. Once the software detects a diagnostic quality image, the meter turns</p>

		<p>green and the clip is automatically recorded without having to press any buttons.</p> <p><a href="https://www.youtube.com/watch?v=URmb72IA4b4">https://www.youtube.com/watch?v=URmb72IA4b4</a> (at 0:48-1:00).</p>
1[f]	<p>receive signals representing a second at least one echocardiographic image;</p>	<p>Caption Guidance repeats the above steps for a second at least one echocardiographic image.</p> <p>For each of the views 135A, 135B, 135N, corresponding guidance 145A, 145B, 145N is determined and presented in sequence of the views 135A, 135B, 135N of the workflow 175 within the user interface 140 as respective graphical instructions 145. In this regard, the corresponding guidance 145A, 145B, 145N includes different directives for positioning and posing the ultrasound imaging probe 120 so as to produce the imagery 155 for a corresponding one of the views 135A, 135B, 135N.</p> <p>US 2021/0052253 A1, ¶ [0021]</p> <p>Please see Element 1[b] above.</p>
1[g]	<p>associate the second at least one echocardiographic image with a second view category of the plurality of predetermined echocardiographic image view categories,</p>	<p>Please see Elements 1[c] and 1[f] above.</p>
1[g][1]	<p>said second view category being different from the first view category;</p>	<p>Caption Guidance acquires a second echo-CG image under a second view category which is different from the first view category.</p> <p>In conducting the ultrasound imaging operation, a workflow 175 of the target organ 130 is selected that includes a sequence of views 135A, 135B, 135N. For example, in connection with the imaging of a heart, the views 135A, 135B, 135N may include a parasternal long axis view, a parasternal short axis view, an apical two, three, four or five chamber view or a subcoastal view,”</p>

		<p>US 2021/0052253 A1, ¶ [0020]; Fig. 1.</p> <p>For each of the views 135A, 135B, 135N, corresponding guidance 145A, 145B, 145N is determined and presented in sequence of the views 135A, 135B, 135N of the workflow 175 within the user interface 140 as respective graphical instructions 145. In this regard, the corresponding guidance 145A, 145B, 145N includes different directives for positioning and posing the ultrasound imaging probe 120 so as to produce the imagery 155 for a corresponding one of the views 135A, 135B, 135N.</p> <p>US 2021/0052253 A1, ¶ [0021].</p>
1[h]	determine, based on the second at least one echocardiographic image and the second view category, a second quality assessment value representing a view category specific quality assessment of the second at least one echocardiographic image; and	Please see Element 1[d] above.
1[i]	produce signals representing the second quality assessment value for causing the second quality assessment value to be associated with the second at least one echocardiographic image;	Please see Element 1[e] above.
1[j]	wherein each of the plurality of predetermined echocardiographic image view categories is associated with a respective set of assessment parameters,	<p>Each of the plurality of predetermined echocardiographic image view categories is associated with a respective set of assessment parameters.</p> <p>To the extent that the imagery 155 is determined to have a corresponding quality value that meets or exceeds a threshold quality <u>for the specified view</u>, a success icon 165 is displayed in connection with the quality meter 150.</p>

		US 2021/0052253 A1, ¶ [0022] (underlining added).
1[j][1]	<p>each of the sets of assessment parameters being a set of neural network parameters that define a neural network having a plurality of layers including an input layer configured to receive one or more echocardiographic images and an output layer configured to output one or more quality assessment values,</p>	<p>As discussed above in Elements 1[d] and 1[h] above, Caption Guidance outputs a view category specific quality assessment value. This assessment is done via a second neural network 270.</p> <p>... a second neural network 270 may be trained to characterize guidance instructions relative to contemporaneously acquired imagery of the target organ. ... as the neural network 270 is presented with contemporaneously acquired imagery of the target organ for the particular one of the views 290, the neural network produces a recommended movement or pose of the ultrasound imaging probe 230 in order to acquire generated imagery deemed acceptable for the particular one of the views 290.</p> <p>US 2021/0052253 A1, ¶ [0028].</p> <p>Caption Guidance assesses the quality of the echocardiographic image in order to provide guidance on the position and orientation of the ultrasound probe. For example:</p> <p><u>In order to help users to acquire high-quality echocardiograms, the guidance algorithm must be able to estimate the positioning of the ultrasound probe from the current imaging and provide real-time guidance based on that estimation for the user to arrive at the ideal positioning and image. It must first be able to grade the quality of the imagery and determine whether it meets diagnostic criteria.</u></p> <p>JAMA Supplement (Feb. 18, 2021)<sup>1</sup> (underlining added).</p>

<sup>1</sup> <https://jamanetwork.com/journals/jamacardiology/fullarticle/2776714#note-HOI210005-1>

1[k]	and wherein the at least one processor is configured to determine the first quality assessment value by:	See below.
1[k][1]	determining that a first set of assessment parameters of the sets of assessment parameters is associated with the first view category; and	In Caption Guidance, each set of assessment parameters is associated with a corresponding view category. <i>See</i> Element 1[d] above (describing quality assessment of echocardiographic image “relative to a known view” and “for the specified view”); <i>see</i> Element 1[j][1] above (describing guidance to acquire images “acceptable for the particular one of the views”).
1[k][2]	in response to determining that the first set of assessment parameters is associated with the first view category, inputting the first at least one echocardiographic image into the neural network defined by the first set of assessment parameters; and	See Element 1[j][1].
1[l]	wherein the at least one processor is configured to determine the second quality assessment value by:	See below.
1[l][1]	determining that a second set of assessment parameters of the sets of assessment parameters is associated with the second view category; and	See Element 1[k][1].
1[l][2]	in response to determining that the second set of assessment parameters is associated with the second view category, inputting the second at least one echocardiographic image into the neural network defined by the second set of assessment parameters.	See Element 1[k][2].