REMARKS/ARGUMENTS

Upon entry of the present amendment, claims 2-4, 8, and 10-17 will be pending in this application. Claims 2 & 8 have been amended, claims 1, 5-7, and 9 have been canceled, and no new claims have been added for consideration. No new matter is added. Based on the following remarks, Applicant respectfully requests reconsideration and allowance of the pending claims.

Claim Rejections - 35 USC § 103

Claims 1-17 are rejected under 35 U.S.C. 103 as being unpatentable over Furman et al. (US 2017/0202518) (hereinafter "Furman") in view of Oweiss et al. (US 2011/0307079) (hereinafter "Oweiss").

To establish a prima facie case of obviousness, the prior art reference, or references when combined, must teach or suggest all of the claim limitations. Applicant respectfully traverses the rejections because the cited references fail to teach or suggest all of the claim limitations.

Claim 8. For example, claim 8 recites:

8. A method of interpreting signals from a brain-machine interface (BMI), the method comprising:

receiving a first set of neural signals from a brain of a subject into a BMI decoder;

translating, using a first model in the BMI decoder, the first set of neural signals into a first command;

detecting, from further neural signals from the subject, a frustration from the subject;

inhibiting the first command by sending a cancelation of the first command, the inhibiting based on the detecting;

routing a second set of neural signals from the brain of the subject to a second model in the BMI decoder based on the detecting;

interpreting, using the second model, the second set of neural signals into a second command; and

sending the second command.

(underlined text added). Support for the amendment is in paragraph [0018] and original claim 9.

As pointed out by p. 9 of the Office Action in its rejection of original claim 9, Furman paragraphs [0067]-[0068] disclose detecting errors in the classification of brain states from a brain-machine interface (BMI). However, the paragraphs fail to disclose, teach, or suggest "sending a cancelation of [a] first command" sent by a model in a BMI decoder. Likewise, Furman FIGS. 5A-5B and 6A-6B do not disclose sending a cancelation either. Applicant has searched the entirety of Furman for such a teaching and found no such canceling of a command, inhibiting, halting, or stopping a command, or otherwise.

At best, Furman paragraph [0068] discloses that its BMI system may initiate a self-correction and recalibration. Yet the same sentence immediately explains that the self-correction and recalibration are "to avoid future errors in similar contexts, as well as in the presence of similar inputs." Avoiding future errors does not imply that a cancelation is sent. Rather, one of ordinary skill in the art would interpret the explanation—especially with the word "future"—as not making a same error again.

Oweiss is cited for a decoder-based interface and does not cure the deficiencies of Furman. Because neither of the references teaches all of the claim limitations, no combination of the references renders the claim unpatentable under § 103. For at least these reasons, Applicant respectfully requests withdrawal of the rejection of claim 8 and all claims depending therefrom.

Claim 14. Claim 14 recites:

14. A method of adjusting an implanted or wearable brain-machine interface (BMI) device, the method comprising:
receiving neural signals from a brain of a subject into an implanted or wearable BMI device;
determining an activity change of the subject based on a sensor;
switching from a first compression algorithm to a second compression algorithm based on the determined activity change;

compressing, using the second compression algorithm in the BMI device, the neural signals into a data stream;

sending the data stream to a BMI controller off-board the subject.

(emphasis added).

Page 6 of the Office Action avers that Furman, in light of Oweiss, teaches "switching from a first compression algorithm to a second compression algorithm based on the determined activity change" as recited. The Office Action cites Oweiss FIG. 27 and paragraphs [0246]-[0251] in support. Applicant disagrees.

Although Furman discloses a BMI that initiates a self-correction and recalibration in a brain state classification system (Furman paragraphs [0067]-[0068]), Furman fails to disclose, teach, or suggest changing a compression algorithm for neural signals based on the self-correction and recalibration.

Oweiss FIG. 27 is a flowchart that explicitly discloses compressing raw data from channel(s) of neuro data (115), detecting spikes (120), sorting spikes (125), estimating their rate (130), and transmitting the rate estimation for real time decoding (135). But there is no disclosure of multiple compression algorithms, let alone switching between them. For example, the flowchart in Oweiss FIG. 27 proceeds in a single line with no branching. Oweiss paragraphs [0246]-[0251] simply re-phrases the flowchart (see below).

[0246] at block **105**, neuro data from an organ, such as a brain, may be collected;
[0247] at block **110**, raw data may be sequentially passed through and at least one active channel may be specified;
[0248] at block **115**, raw data may be compressed and transmitted for offline analysis;
[0249] at block **120**, spikes may be detected;
[0250] at block **125**, the spikes may be sorted;
[0251] at block **130**, a underlying neuronal firing rates may be estimated;

There is no disclosure of switching compression algorithms, let alone switching based on a change in brain states.

Even if one of skill in the art were to combine Furman's self-correction and recalibration of brain states with Oweiss's data compression, spike detection, and rate estimation, one would not have ended up with an embodiment as claimed. There is only one algorithm shown in Oweiss's figure for compression/spike detection/rate estimation, and changing a brain state classification system in Furman would not change anything about that algorithm.

Because the references fail to teach or suggest all of the claim limitations, no combination of the references can render the claim unpatentable under § 103. For at least these reasons, Applicant respectfully requests withdrawal of the rejection of claim 14 and all claims depending therefrom.

Amendments to the Claims

Unless otherwise specified or addressed in the remarks section, amendments to the claims are made for purposes of clarity and are not intended to alter the scope of the claims or limit any equivalents thereof. The amendments are supported by the specification and do not add new matter.

CONCLUSION

In view of the foregoing, Applicant believes all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Except for the issue fees payable under 37 C.F.R. § 1.18, the Director is authorized to charge any additional fees during pendency of this application, including any required extension

of time fees, or credit any overpayment to Deposit Account Number 20-1430. This paragraph is intended to be a constructive petition for extension of time in accordance with 37 C.F.R. § 1.136(a)(3).

If the Examiner believes a telephone conference would expedite prosecution of this application, please contact the undersigned at (925) 472-5000 or mmathison@kilpatricktownsend.com.

Respectfully submitted,

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