Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ERIC L. ALTSCHULER
and
FARID U. DOWLA

Appeal No. 96-2635
Application 07/993,050[1]

ON BRIEF

Before CALVERT, LYDDANE and FRANKFORT, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

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[1] Application for patent filed December 18, 1992.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 5, 7 through 17, 21 and 22, which are all of the claims remaining in this application. Claims 6 and 18 through 20 have been canceled.

Appellants' invention relates to a method of producing a communication or control signal using the mu wave from the brain of a person. As noted on page 5 of the specification,

> [t]he invention detects brain waves, i.e. electroencephalogram (EEG) signals, to determine whether a person is a) moving or thinking about moving, or b) not moving and not thinking about moving. A pair of electrodes are placed over the motor cortex on the central region of the scalp on opposite sides of the head. The EEG machine records the potential difference between these two electrodes. When a person is resting, i.e., not moving and not thinking about moving, there is a large wave, known as the mu wave, present typically in the 8-13 Hz region. When the person moves, or thinks about moving, a suitable body part[,] the wave substantially decreases. Thus the system operates on the basis of mu wave attenuation caused by actual movement or movement rehearsal (thinking of moving). Digital signal processing of the EEG wave is used to produce a control signal, which can be used to communicate or actuate various machines.

Independent claims 1, 14 and 21 are representative of the claimed subject matter and a copy of those claims, as they appear in the Appendix to appellants' brief, is attached to this decision.

The references of record relied upon by the examiner in rejections of the appealed claims under 35 U.S.C. § 103 are:

Anderson	3,826,243	July 30, 1974
Settle et al. (Settle)	4,013,068	Mar. 22, 1977
Ross et al. (Ross)	4,800,893	Jan. 31, 1989
Prichep	5,083,571	Jan. 28, 1992

While the examiner on pages 2, 3 and 4 of the answer (Paper No. 20) has listed some 21 references as "relied upon in the rejection of claims under appeal," we note that only the four references listed above are applied in the rejections of claims 1 through 5, 7 through 17, 21 and 22 set forth on pages 4-7 of the examiner's answer. Accordingly, it is to those four references that we have directed our attention in deciding this appeal.

Claims 21 and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ross in view of Settle.

Claims 1, 5, 7 through 9, 11 and 13 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ross in view of Settle and Anderson.

Claims 2 through 4, 10, 12 and 14 through 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ross in view of Settle and Anderson as applied to claim 1 above, and further in view of Prichep.

Rather than reiterate the examiner's explanation of the above-noted rejections and the conflicting viewpoints advanced by the examiner and appellants regarding those rejections, we make reference to the examiner's answer (Paper No. 20, mailed August 21, 1995) for the examiner's reasoning in support of the rejections, and to appellants' brief (Paper No. 15, filed March 6, 1995) and reply brief (Paper No. 21, filed September 26, 1995) for appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by appellants and the examiner. As a consequence of this review, we have made the determination that the examiner's respective rejections of the appealed claims under 35 U.S.C. § 103 cannot be sustained. Our reasons follow.

The proper test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art. See Cable Elec. Products, Inc. v. Genmark, Inc., 770 F.2d 1015, 1025, 226 USPQ 881, 886-887 (Fed. Cir. 1985); In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983); In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). The law followed by our court of review, and thus by this Board, is that "[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Rinehart, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976).

On page 9 of the examiner's answer, the examiner indicates that

> [t]he examiner concedes that Ross et al does not explicitly state or suggest the monitoring of the mu wave.

In addition, the examiner urges that it has never been a contention by the examiner that Ross discloses the measurement of the mu wave. Instead, it is the examiner's position that

> Ross et al does measure and monitor the brain waves emanating from the motor cortex region of the brain, but Ross et al is silent on the frequencies over which the waves are monitored. Since the mu wave involves measuring the 8-13 Hz brainwaves emanating from the motor cortex, Ross et al fails to show all claimed features. Ross et al only shows the location of brain waves. This deficiency is filled by the teaching reference, Settle et al (U.S. Pat. No. 4,013,068, referred to by the appellant as "Settle"). Settle et al, as discussed in the body of the above rejection, teaches using the 7.5-13 Hz brain waves for teaching mind control. Since mind control is the primary concern of Ross et al (and the primary concern of the present inventors) it is the position of the examiner that it would have been obvious to one having ordinary skill in this art to utilize this range when using the device and method of Ross et al since Ross et al is silent on the frequency of use and since mind control is of import to the Ross et al objectives. The resulting device and method would then monitor the 7.5-13 Hz brainwaves emanating from the motor cortex of

> the patient. This, by definition, would constitute monitoring the mu wave.

For the reasons aptly stated by appellants in their brief (pages 6-13), and particularly, in their reply brief, we find the examiner's above-noted reasoning and conclusion of obviousness to be in error. Appellants claim a method of measuring one particular brain wave of the apparently several different brain waves that exist in the 8-13 Hz frequency range and controlling that particular brain wave (the mu wave) in a defined manner to produce a particular result (i.e., a binary control signal derived from the changes of the mu wave above and below a predetermined threshold level). Nothing in Ross alone, or in combination with the other references applied by the examiner, teaches or suggests appellants' claimed method. Contrary to the examiner's position, neither Ross nor Settle teaches or suggests monitoring or use of the mu wave in the manner defined in claims 1 through 5, 7 through 17, 21 and 22 on appeal. As urged by appellants, it appears clear that Ross, like Settle, is dealing with alpha waves. As pointed out by appellants in paragraph (4) on pages 1-2 of their reply brief,

the examiner's conclusion (answer, page 9) that "the mu wave is the alpha wave produce[d] by the motor cortex region of the brain" is simply incorrect. Our review of the Anderson and Prichep patents additionally relied upon by the examiner reveals nothing which would supply the deficiencies in the teachings of Ross and Settle noted above.

Based on the foregoing, the decision of the examiner rejecting claims 1 through 5, 7 through 17, 21 and 22 under 35 U.S.C. § 103 is reversed.

REVERSED

IAN A. CALVERT Administrative Patent Judge	)	
WILLIAM E. LYDDANE Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
CHARLES E. FRANKFORT Administrative Patent Judge	)	

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APPENDED CLAIMS

1. Method of producing a communication or control signal using the mu wave from the brain of a person, comprising:

monitoring the mu wave from the brain of the person;

producing changes in the mu wave by performing movement or movement rehearsal by the person of a particular body part or parts of the person to attenuate the mu wave of the person in a selected pattern from the value of the mu wave when the person is neither moving nor thinking of moving;

measuring said mu wave attenuation from the brain of the person caused by movement or movement rehearsal of said body part or parts of the person;

converting said measured mu wave attenuation to a communication or control signal by signal processing the measured mu wave to obtain a power spectrum and comparing the peak power spectrum value to a predetermined threshold value.

14. Method comprising:

placing a pair of electrodes substantially over the motor cortex of a person's scalp, one on each side of the head;

taking an EEG by measuring a voltage difference signal between the two electrodes;

taking a Fast Fourier Transform (FFT) of the voltage difference signal;

obtaining the power spectrum $P = *FFT*^2$ of the voltage difference signal;

comparing the peak value of the power spectrum of the mu wave in the 8-13 Hz range to a baseline value to determine whether the person is either (a) neither moving nor thinking of moving a body part, or (b) either moving or thinking of moving a body part;

producing a binary control signal by changing between (a) and (b).

21. Method of producing a communication or control signal by an unaided person, comprising:

monitoring the mu wave from the brain of the person;

determining whether the mu wave is above or below a single threshold value, wherein values above the threshold correspond to the person at rest, when the person is neither moving nor thinking of moving a body part of the person, and values below the threshold correspond to movement, when the person is either moving or thinking of moving a body part of the person;

producing changes above and below the single threshold value by alternating between (a) neither moving nor thinking of moving a body part of the person and (b) either moving or thinking of moving a body part of the person,

producing a binary communication or control signal from the changes of the mu wave above and below the threshold value.