UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YASUHIRO KASAHARA,
YUKA HONDA,
and
KIHURA SUNAKO,
Appellants

Appeal 2008-4909
Application 11/097,133[1]
Technology Center 3700

Decided: October 06, 2008

Before CAROL A. SPIEGEL, ERIC GRIMES, and JEFFREY N. FREDMAN, *Administrative Patent Judges*.

SPIEGEL, *Administrative Patent Judge*.

DECISION ON APPEAL

I. Statement of the Case

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[1] Application 11/097,133 ("the 133 application"), *Body Fat Measurement Apparatus*, filed 4 April 2005, claims benefit under 35 U.S.C. § 119 of Japanese application 2004-111349, filed 5 April 2004. The real party in interest is said to be Tanita Corporation (Corrected Appeal Brief, filed 17 October 2007 ("App. Br."), 1).

Appellants appeal under 35 U.S.C. § 134 from a final rejection of all the pending claims, claims 1-3 and 5-10. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

The subject matter on appeal is directed to an apparatus that measures the body fat of a person based on impedance and lateral width of the subject's abdomen. Claims 1 and 3 are illustrative and read (App. Br. 13-14):

> 1. A body fat measurement apparatus comprising an impedance measurement electrode system including a pair of current supplying electrodes and a pair of voltage measurement electrodes, those electrodes adapted *to* contact a peripheral surface of an abdomen of a person under test to measure an impedance of the abdomen, on the basis of which an index of body fat of the person under test is calculated, said apparatus further comprising:
>
> an electrode support unit;
>
> ***a lateral width measurement unit***; and
>
> an arithmetic unit,
>
> wherein
>
> said electrode support unit supports the impedance measurement electrode system so that the respective current supplying electrodes thereof can contact respective portions of a front surface of the abdomen of the person under test near left and right sides of the abdomen, and the respective voltage measurement electrodes thereof can contact respective portions of the front surface of the abdomen between the current supplying electrodes, such that a region of voltage measurement extends to muscle tissue for measuring the impedance of the abdomen,

said lateral width measurement unit measures a lateral width of the abdomen of the person under test, and

said arithmetic unit calculates the index of body fat of the person under test on the basis of the impedance of the abdomen and the lateral width.

3. A body fat measurement apparatus comprising an impedance measurement electrode system including a pair of current supplying electrodes and a pair of voltage measurement electrodes, those electrodes adapted for contact with a peripheral surface of an abdomen of a person under test to measure an impedance of the abdomen, on the basis of which an index of body fat of the person under test is calculated, said apparatus further comprising:

an electrode support unit;

an electrode position shift unit; and

an arithmetic unit,

wherein

said electrode support unit has an arrangement variable to suit a lateral width of the abdomen to make contact with the left and right sides of the abdomen, and supports the impedance measurement electrode system so that the respective current supplying electrodes thereof can contact respective portions of a front surface of the abdomen of the person under test near left and right sides of the abdomen, and the respective voltage measurement electrodes thereof can contact respective portions of the front surface of the abdomen between the current supplying electrodes, such that a region of voltage measurement extends to muscle tissue for measuring the impedance of the abdomen,

said electrode position shift unit is for changing the contact positions of the electrodes according to the dimensions of the abdomen on the basis of an abdomen lateral width position

> ***when the electrode support unit is varied to suit the lateral width of the abdomen to make contact with the left and right sides of the abdomen***, and said arithmetic unit calculates the index of body fat of the person under test on the basis of the impedance of the abdomen and the lateral width.

(Emphasis added to highlight the differences between claims 1 and 3.)

The Examiner has rejected (i) claims 1-3, 5, and 7-9 as unpatentable under 35 U.S.C. § 102(e) or, in the alternative, under 35 U.S.C. § 103(a) over Onda;[2] (ii) claim 6 as unpatentable under 35 U.S.C. § 103(a) over Onda in view of Hoey;[3] and (iii) claim 10 as unpatentable under 35 U.S.C. § 103(a) over Onda in view of Bjornson[4] (Ans.[5] 2-3).

Appellants have not argued the patentability of any dependent claim separately from the independent claim it depends on (App. Br. 9, 11, and 12). Therefore, we decide this appeal on the basis of claims 1 and 3, the only pending independent claims. 37 C.F.R. § 41.67(c)(1)(vii).

Central to deciding whether the claimed invention is anticipated by or obvious over the prior art is whether Onda discloses or suggests determining a body fat index based on impedance and abdominal lateral width.

II. Findings of Fact ("FF")

The following findings of fact are supported by a preponderance of the evidence of record.

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[2] U.S. Patent Application Publication 2004/0077969 A1, *Apparatus for Measuring Body Fat*, published 22 April 2004, by Onda et al. ("Onda").
[3] U.S. Patent Application Publication 2002/0072686 A1, *Tissue Discrimination and Applications in Medical Procedures*, published 13 June 2002, by Hoey et al. ("Hoey").
[4] U.S. Patent 4,097,997, *X-ray Calipers*, issued 4 July 1978, to Allen L. Bjornson ("Bjornson").
[5] Examiner's Answer mailed 30 January 2008 ("Ans.").

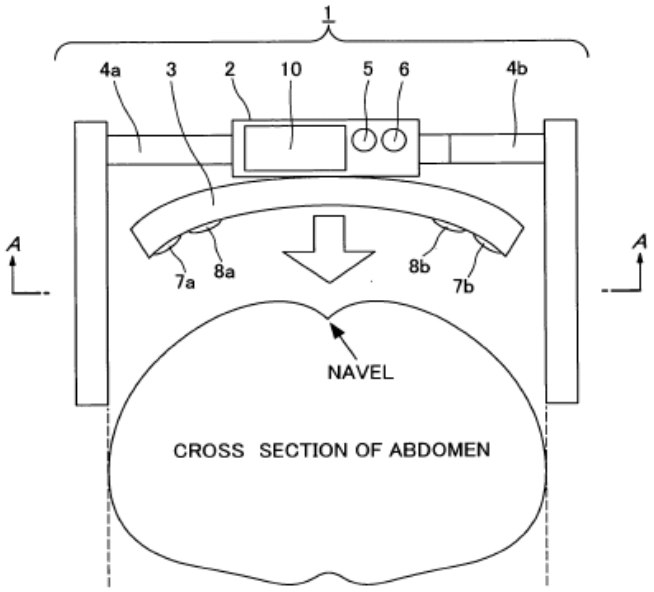
A. Appellants' 133 application

[1] According to the 133 specification ("Spec." 13:11-27), Figure 1 shows an embodiment of a body fat measurement apparatus 1 comprising

> a body portion 2, an electrode support unit 3, and left and right arm portions 4a and 4b.
>
> The body portion 2 . . . includes a power switch 5 for turning the apparatus ON or OFF, a measurement switch 6 for starting measurement, and a display unit 10 . . . .
>
> The electrode support unit 3 is designed to be mounted to a side surface of the body portion 2 and is formed from some flexible member to provide a curved leaf spring so that one side thereof that is to be contact[ed] with [the] front surface of [the] abdomen . . . is directed inwardly. . . . An impedance measurement electrode system 9 including a pair of current supplying electrodes 7a and 7b and a pair of voltage measurement electrodes 8a and 8b is provided near both end portion[s] of the electrode support unit 3. In particular, the pair of voltage measurement electrodes 8a and 8b is positioned between the pair of current supplying electrodes 7a and 7b.

Figure 1 of the 133 application is reproduced below:

FIG. 1



{Figure 1 of the 133 application shows a top view of a body fat measurement apparatus when it is in use.}

[2] The apparatus shown in Figure 1 also includes a sliding mechanism to move the arm portions 4a and 4b in left and right directions, respectively, by equal distances from body portion 2, such that contacting the left and right arm portions 4a and 4b with the left and right sides of a person's abdomen, respectively, positions body portion 2 at the center of the front surface of the person's abdomen and positions the impedance measurement electrode system 9 symmetrically about the center of the abdomen in left-and-right direction (Spec. 14:5-16).

[3] Power switch 5, measurement switch 6, and display unit 10 are connected to controller unit 11 (Spec. 15:9-10).

[4] Controller unit 11 includes arithmetic unit 15 which calculates impedance value and index of body fat (Spec. 14:22-30).

[5] Controller unit 11 also includes encoder unit 16 which measures the "lateral width of the abdomen" by measuring the side-to-side distance arm portions 4a and 4b are moved by the sliding mechanism of body portion 2 (Spec. 15:1-8).

[6] The 133 specification also describes a second embodiment wherein

> instead of the flexible electrode support unit 3 of the first embodiment [shown in Figure 1], a rigid electrode support unit 31 is provided . . . in which . . . current supplying electrodes 7a, 7b and . . . voltage measurement electrodes 8a, 8b are mounted to an abdomen contact surface of the rigid electrode support unit 31 via flexible members 32 which allow said electrodes to freely be changed in contact direction to [the] abdomen of a person. . . . (Spec. 22:12-23).

B. Onda

[7] Onda discloses a body fat measuring apparatus comprising two current supply electrodes, two measuring electrodes, a voltage measuring unit, and "a computing unit to compute a visceral fat quantity of the subject according to the measured voltage and *a characteristic quantity* representing the size of the subject" (Onda ¶ 12, emphasis added).

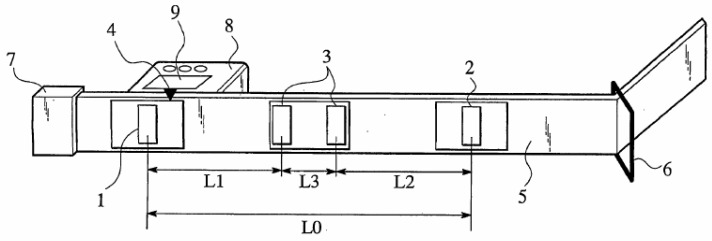
[8] "The '*characteristic quantity*' . . . is a quantity that reflects the size of a cross sectional area of the subject, such as . . . a circumferential length U around a cross section of the subject, a longitudinal width W1 between the abdomen and back of the subject, or a *lateral width W2 between the flanks of the subject*" (Onda ¶ 14, emphasis added).

[9] In an embodiment shown in Figure 7, Onda discloses a body fat measuring apparatus comprising

> a first electrode group **1** including an electrode and arranged on the abdominal surface of a subject (human) with the navel of the subject serving as a reference position, a second electrode group **2** including an electrode and arranged on the back surface of the subject, a third electrode group **3** including two electrodes and arranged on the surface of the subject at an intermediate position between the first and second electrode groups, a navel marker **4** to indicate the reference position where the first electrode group **1** is positioned, a belt **5** that is substantially inelastic and then is not stretchable, buckles **6** and **7** to fix the belt **5** around the body of the subject, and a controller **8** (Onda ¶ 75).

Onda Figure 7 is reproduced below.

FIG.7



{Figure 7 shows a body fat measuring system according to a second embodiment disclosed in Onda.}

[10] Controller **8** supplies current to electrode groups **1** and **2**, measures voltage generated between the electrodes of group **3**, and includes a computing unit to compute abdominal fat based on the measured voltage and data entered into an input unit, which may also be part of controller **8** (Onda ¶ 76).

[11] Scale marks may be added to belt **5** to measure the waist of a subject (Onda ¶ 87).

[12] According to Onda (Onda ¶ 89),

> [t]o improve measuring accuracy, it is preferable to fix the electrodes on the belt **5** in such a way as to substantially equalize the distance L1 between the first and third electrode groups **1** and **3** with the distance L2 between the second and third electrode groups **2** and **3**. Then, the third electrode group **3** detects a voltage generated at an intermediate point between the first and second electrode groups **1** and **2** irrespective of the waist measurement of the subject.

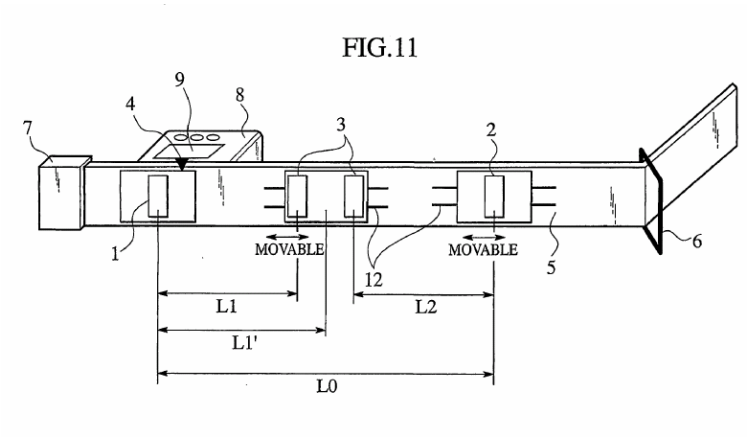
[13] In a modification of the system shown in Figure 7, an elastic belt **11** may be used instead of inelastic belt **5** (Onda ¶ 96).

[14] Since the distance between electrode groups will vary when using an elastic belt **11**, a distance L0 between the first and second current supplying electrode groups is preferably ⅓ to ⅔ of an unextended length of belt **11** and distances L1 and L2 are substantially equal (Onda ¶ 97; Figure 9).

[15] In another modification of the system shown in Figure 7, the second and third electrode groups **2** and **3** are movable on rails **12** (Onda ¶ 102, Figure 11).

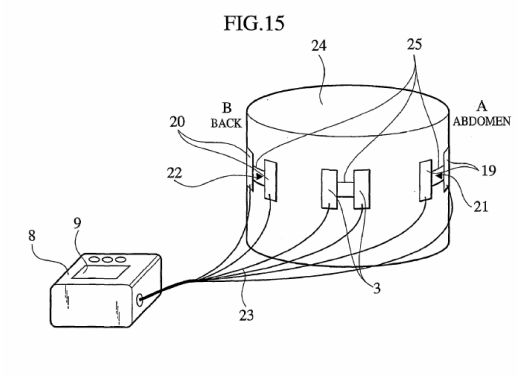
[16] As stated by Onda, "[f]or example, the distance L0 between the first and second electrode groups is ½ of the waist measurement of a subject, and a distance L1' between the first electrode group **1** and a center position of the third electrode group **3** is ¼ of the waist measurement" (Onda ¶ 102).

[17] Figure 11 of Onda shows a modification having movable electrode groups **2** and **3** arranged on rails **12** and is reproduced below:



{Figure 11 of Onda shows a body fat measuring system embodiment having movable electrode groups.}

[18] In a modification shown in Figure 15, the electrodes in each electrode group are supported on a thin, preferably transparent, plastic plate **25** that curves along the surface of the body **24**. Since the plastic plate **25** is not substantially stretchable, the distance between the electrodes is kept constant, but the flexibility of plate **25** keeps the electrodes stably in contact with the surface of body **24** (Onda ¶ 120). Figure 15 is reproduced below.



{Figure 15 of Onda shows a body fat measuring system embodiment with movable electrode groups.}

Other findings of fact follow below.

III. Discussion

Independent claims 1 and 3 stand rejected as anticipated by or, alternatively, obvious over Onda (Ans. 3).

A. Legal standard

"[A]s an initial matter, the PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant's specification." *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

"A reference anticipates a claim if it discloses the claimed invention 'such that a skilled artisan could take its teachings in *combination with his own knowledge of the particular art and be in possession of the invention*.'" *In re Graves*, 69 F.3d 1147, 1152 (Fed. Cir. 1995) (quoting *In re LeGrice*, 301 F.2d 929, 936 (CCPA 1962)). Of course, anticipation "is not an 'ipsissimis verbis' test." *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990) (citing *Akzo N.V. v. United States Int'l Trade Comm'n*, 808 F.2d 1471, 1479 n.11 (Fed. Cir. 1986)). "An anticipatory reference . . . need not duplicate word for word what is in the claims." *Standard Havens Prods. Inc. v. Gencor Indus.*, 953 F.2d 1360, 1369 (Fed. Cir. 1991).

A claimed invention is not patentable if it would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex, Inc.,* 127 S.Ct. 1727 (2007); *Graham v. John Deere Co. of Kansas*

City, 383 U.S. 1 (1966). Facts relevant to a determination of obviousness include (1) scope and content of the prior art, (2) any differences between the claimed invention and the prior art, (3) the level of ordinary skill in the art, and (4) relevant objective evidence of obviousness or nonobviousness. *KSR*, 127 S.Ct. at 1734; *Graham*, 383 U.S. at 17.

B. The Examiner's findings and conclusions

The Examiner found Onda discloses a body fat measurement apparatus as recited in claims 1 and 3. Specifically, the Examiner found the apparatus of Onda included an electrode support unit (i.e., belt 5, 11, 25) supporting an impedance measurement electrode system (i.e., electrode groups 1, 2, 3), and an arithmetic unit (i.e., controller 8), as required by claims 1 and 3 (Ans. 3-6). As to claim 1, in particular, the Examiner found the apparatus of Onda included a lateral width measurement unit (referring to scale marks which may be added to belt 5 of Onda to measure the waist of a subject) (Ans. 4). Upon further consideration, the Examiner directed attention to paragraph 14 of Onda which discloses that a "characteristic quantity" reflective of the size of a cross sectional area of a subject being measured includes not only the subject's waist measurement but also "a lateral width W2 between the flanks of the subject" (Ans. 9-10). As to claim 3, in particular, the Examiner found the apparatus of Onda included an electrode position shift unit (i.e., buckles 6, rails 12, sliders 17 and 18) (Ans. 5-6). Thus, the Examiner found claims 1 and 3 are anticipated by Onda (Ans. 3).

Alternatively, the Examiner found Onda discloses the apparatuses of claims 1 and 3 but for expressly disclosing the current supplying electrodes are positioned at the flanks of the abdomen while the voltage measurement

electrodes contact the front of the abdomen (Ans. 7). The Examiner concluded (Ans. 7-8,original italics):

> [S]ince Onda . . . teach[es] current supplying electrodes . . . located at a back and front surface of the abdomen while the voltage measurement electrodes contact[] a side surface thereof . . ., it would have been obvious . . . to provide an apparatus . . . with current supplying electrodes . . . locatable at the front surface of the abdomen at right and left sides while the voltage measurement electrodes contact[] the front surface since both electrode arrangements estimate abdominal body fat (see abstract). Moreover, it has previously been held that merely shifting location of parts in not patentable--*See In re Japiske*, *181 F. 2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1050).*

C. Appellants' position

As to claim 1, Appellants argue Onda does not disclose or suggest the recited (a) lateral width measurement unit because Onda measures waist circumference, (b) arithmetic unit because calculating a body fat index based on abdominal lateral width, rather than waist circumference, would require a different formula and, therefore, different hardware or software, or (c) electrode support unit because Onda positions electrodes on the front or on the front and back of the abdomen, not on the flanks of the abdomen (App. Br. 6-9). Appellants further argue a lack of motivation to modify the apparatus of Onda to calculate a body fat index based on abdominal lateral width given a strong correlation between body fat index and waist circumference said to be common general knowledge in the art, as exemplified by Onda.

Appellants state the apparatus of claim 3 "operates on the same basic principle as claim 1" (App. Br. 9). However, the apparatus of claim 3 "correlates impedance measured at the sides of the abdomen with body fat index, thereby eliminating the need to measure the lateral width of the abdomen, and simplifying data processing" (App. Br. 9). Appellants argue Onda does not disclose or suggest the electrode support unit or electrode position unit of claim 3 because Onda does not disclose or suggest placing electrodes near the left and right sides (flanks) of the abdomen (App. Br. 10-11).

D. Analysis

As an initial matter, we construe the term "lateral width of the abdomen" to be the straight line distance between the flanks of the abdomen, i.e., a side-to-side lateral width. Construing "lateral width of the abdomen" as the arcing line distance around the abdomen from flank-to-flank (side-to-side) not only unreasonably equates a one-half waist measurement to an abdomenal lateral width measurement, but also is inconsistent with the 133 specification and the prior art (FF 5 and 8).

1. Claim 1

Consequently, since the Examiner's finding that the apparatus of Onda includes a lateral width measurement unit, i.e., belt 5 with scale marks for measuring the waist of a subject, is based on an erroneous interpretation of "lateral width measurement," we agree with Appellants that the apparatus of claim 1 is not anticipated by Onda. However, Onda expressly discloses a body fat measuring apparatus which computes a body fat index based on

measured voltage, i.e., impedance, and *a characteristic quantity* expressly stated to include not only a subject's waist measurement but also *a lateral width W2 between the flanks of the subject* (FF 7-8). Thus, while Onda does not disclose an apparatus comprising a lateral width measurement unit *per se*, Onda expressly suggests an apparatus comprising a unit for lateral width measurement.

Appellants have not challenged the Examiner's finding that "Bjornson discloses an apparatus including a lateral width measurement unit that is variable in left and right directions by an equal distance with respect to the center of a support unit to suit the lateral width of a chest" (Ans. 9). It also appears that the Examiner views Onda as suggesting length measurements "similar to a caliper scale" (Ans. 16). Regardless, both the express motivation and skill to modify the apparatus of Onda to include a lateral width measurement unit as required by claim 1 are found in the prior art. Hence, the argument that Onda does not disclose or suggest the lateral width measurement unit of claim 1 does not persuade us that an apparatus including a lateral width measurement unit is nonobvious over Onda.

Similarly, Onda expressly directs one of ordinary skill in the art to compute a body fat index based on measured voltage (impedance) and lateral width W2 between the flanks of the subject (abdominal lateral width). Thus, Onda discloses and suggests the arithmetic unit of claim 1.

In addition, Onda expressly discloses moving the current supplying (1 and 2) and voltage measuring (3) electrodes supported on belt (5, 11, 25) into desired positions on the belt (FF 12-18). Appellants have not shown that the movable electrodes supported on the belt of Onda are incapable of being moved to the desired positions recited in claim 1. To the contrary, in

one embodiment, Onda teaches that the distance between the current supplying electrodes is ½ of the waist measurement with the voltage measuring electrodes midway between the current supplying electrodes (FF 16). We note that Onda prefers arranging the current supplying electrodes on the back and abdomen of the subject for a more accurate computation of body fat index (Onda ¶ 64). However, "[i]t is axiomatic that a reference must be considered in its entirety, and it is well established that the disclosure of a reference is not limited to specific working examples contained therein." *In re Fracalossi*, 681 F.2d 792, 794 n.1 (CCPA 1982). Prior art must be considered for everything it would have fairly taught the artisan. *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976). Moreover, the teaching of a reference should not be limited to its preferred embodiments. *In re Burckel*, 592 F.2d 1175, 1179 (CCPA 1979); *In re Mills*, 470 F.2d 649, 651 (CCPA 1972). Therefore, Onda discloses or suggests an electrode support unit as recited in claim 1.

Finally, the argument that there is no motivation to modify the apparatus of Onda to calculate a body fat index based on abdominal lateral width is belied by Onda's own express disclosure as discussed above. Namely, Onda expressly discloses a body fat measuring apparatus which computes a body fat index based on measured voltage, i.e., impedance, and *a characteristic quantity* expressly stated to include not only a subject's waist measurement but also *a lateral width W2 between the flanks of the subject* (FF 7-8).

In summary, we reverse the rejection of claim 1 under § 102, but sustain its rejection under § 103, over Onda.

2. Claim 3

As stated by Appellants, the apparatus of claim 3 does not require a lateral width measurement unit (App. Br. 9). Rather claim 3 requires, in relevant part (App. Br. 14), an electrode support unit and an electrode position shift unit, wherein

> said electrode position shift unit is for changing the contact positions of the electrodes according to the dimensions of the abdomen on the basis of an abdomen lateral width position when the electrode support unit is varied to suit the lateral width of the abdomen to make contact with the left and right sides of the abdomen.

In other words, the wider the abdomen lateral width of a subject, the bigger the subject, which requires the electrode position shift unit to move the electrodes on the electrode support unit to maintain the electrodes in the desired positions on the subject's abdomen.

In one embodiment, Onda teaches keeping the distance between the current supplying electrodes at ½ of the waist measurement with the voltage measuring electrodes midway between the current supplying electrodes (FF 16). Thus, given two subjects, "A" having a 32 inch waist and "B" having a 40 inch waist, the current supplying electrodes would be positioned 16 inches apart for "A" and 20 inches apart for "B", with the voltage measuring electrodes midway between 16 and 20 inches, respectively, for "A" and "B."

Appellants argue "the electrodes' position will not change to be automatically in a particular place around the abdomen" with Onda's apparatus, i.e., Onda teaches that its electrodes can be manually moved (App. Br. 10). Appellants conclude "Onda's belt with movable electrodes does not have the structure to perform the required function of the recited

electrode position shift unit of changing electrode positions when the electrode support unit is adjusted" (App. Br. 10).

As noted by the Examiner (Ans. 20), claim 3 does not require the electrode position shift unit to reposition the electrodes "automatically" in response to a variable adjustment of the electrode support unit. Appellants have not pointed to where the 133 specification defines an electrode position shift unit to exclude a manually operated unit. Appellants have not shown that the electrodes supported on the belt (electrode support unit) of Onda are incapable of being moved by the buckles, rails, sliders (electrode position shift unit) of Onda to the desired positions recited in claim 3.

In summary, giving claim 3 its broadest reasonable interpretation consistent with its supporting disclosure, we find no structural distinction between an apparatus within the scope of appealed claim 3 and the apparatus fairly described by Onda. Consequently, we sustain the rejection of claim 3 under §§ 102 and 103 over Onda.

3. Conclusion

The rejection of (i) claim 1 and claims 2, 5, and 7-9 dependent thereon, as unpatentable under § 102 over Onda is reversed, (ii) claim 3 as unpatentable under § 102 over Onda is sustained, (iii) claims 1-3, 5, and 7-9 as unpatentable under § 103 over Onda is sustained, (iv) claim 6 as unpatentable under § 103 over Onda and Hoey is sustained, and (v) claim 10 as unpatentable under § 103 over Onda and Bjornson is sustained.

IV. Order

Upon consideration of the record, and for the reasons given, it is

ORDERED that the decision of the Examiner rejecting claims 1, 2, 5, and 7-9 as unpatentable under 35 U.S.C. § 102(e) over Onda is reversed,

FURTHER ORDERED that the decision of the Examiner rejecting claim 3 as unpatentable under 35 U.S.C. § 102(e) over Onda is affirmed,

FURTHER ORDERED that the decision of the Examiner rejecting claims 1-3, 5, and 7-9 as unpatentable under 35 U.S.C. § 103(a) over Onda is affirmed,

FURTHER ORDERED that the decision of the Examiner rejecting claim 6 as unpatentable under 35 U.S.C. § 103(a) over Onda and Hoey is affirmed,

FURTHER ORDERED that the decision of the Examiner rejecting claim 10 as unpatentable under 35 U.S.C. § 103(a) over Onda and Bjornson is affirmed, and

FURTHER ORDERED that no time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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