(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 641 385 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
27.03.2013 Bulletin 2013/13

(21) Application number: **04749141.0**

(22) Date of filing: **06.07.2004**

(51) Int Cl.:
A61B 5/00 *(2006.01)*

(86) International application number:
PCT/SE2004/001105

(87) International publication number:
WO 2005/002430 (13.01.2005 Gazette 2005/02)

(54) **SATIETY METER**

SÄTTIGUNGSMESSER

DISPOSITIF DE MESURE DU DEGRE DE SATIETE

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

(30) Priority: **07.07.2003 SE 0301997**

(43) Date of publication of application:
05.04.2006 Bulletin 2006/14

(73) Proprietor: **Mandometer AB**
141 04 Huddinge (SE)

(72) Inventors:
- **BERGH, Cecilia**
  S-118 20 Stockholm (SE)
- **SÖDERSTEN, Per**
  S-118 20 Stockholm (SE)
- **ZANDIAN, Michel**
  S-120 68 Stockholm (SE)

(74) Representative: **Allee, Harriet Eva Charlotta et al**
BRANN AB
P.O. Box 12246
102 26 Stockholm (SE)

(56) References cited:
WO-A1-96/02183
US-A- 5 817 006
US-A- 6 075 755
US-B1- 6 560 165

EP 1 641 385 B1

Printed by Jouve, 75001 PARIS (FR)

Description

Technical field

[0001] The present invention pertains to a computerized handheld device, substantially pocket sized, registering fullness and responding to fullness, utilized for aiding a person in a controlled manner to appreciate when to eat.

Background art

[0002] By necessity a person has to eat in order to feel well and to be able to cope with every day duties. Changed eating behavior following increasing demands to perform well in various areas of business, sports, school etc., and social situations involving for instance unemployment or illness has made the society and healthcare aware of several forms of severe, when not almost immediately treated, eating disorders. Such disorders are for example obesity, gastrointestinal, anorexia, bulimia nervosa and others.

[0003] When a person has developed what could be regarded as an eating disorder such as for instance obesity it is very hard to reach back to normal eating behaviors. An obese person treated in line with current methods for relieving obesity is almost certain to be put under heavy dieting similar to starving. Such dieting may very well lead to a weight loss of 5 kg per month or more. Far from all obese persons can tolerate to be put under such strain for longer periods, and those who do often fall back to their initial eating behavior and start to gain weight.

[0004] Scientists in the field of research relating to eating behaviors are astonished when they interview people, not only obese, with eating disorders that those interviewed are unable to feel satiety or fullness, i.e., the mechanism of being able to determine or feel satiety is disabled. Hence, it is of importance to teach or train a person having an eating disorder to regain the skill of feeling fullness.

[0005] In 1982, Borg performed psychophysical studies of the subjective estimation of workload, Borg G, 1982, "A category scale with ratio properties for intermodal and individual comparisons", In: Greissler H-G, Petzold YM (eds): "psychophysical Judgment and the process of perception", pp 25-34, Springer Verlag: Berlin. Borg construed a scale that generates data on the level of an intervale scale with equal steps.

[0006] Bergh and Södersten introduced a modified Borg type scale in their patent EP 0794 727 largely corresponding to US patent 5,817,006 to Bergh et al, but added unequal or narrower steps in order to be able to quantify parts of the scale with a finer resolution. In these patents, the Borg type scale is used to quantify satiety correlatively to eating rate so that a test person can practice eating at a conventional rate. A conventional meal or lunch should take approximately 12-15 minutes.

[0007] The Bergh et al research within the field of eating disorders has been published by Proceedings of The National Academy of Science (PNAS), "Randomized controlled trial of a treatment for anorexia and bulimia nervosa", pages 9486-9491, July 9, 2002, and in The Lancet, "A new treatment of anorexia nervosa", vol. 348, No. 9027, pages 611-612, 1996.

[0008] It is known to persons skilled in the art that the gastrointestinal hormone cholecystokinin (CCK) is a determinant of satiety such that its pattern of secretion and the level of deprivation of food affect the rate of eating to become negatively accelerated and the experience of satiety positively accelerated with an increase in deprivation. This is true for healthy people, but not necessarily for those who have developed an eating disorder.

[0009] An example of an eating disorder were a person does not respond to satiety in accordance with the level of CCK is provided in Holland et al in 'Measurement of Excessive Appetite and Metabolic Changes in Prader-Willi Syndrome', International Journal of Obesity, 17, No. 9, 1993, pages 527-532, is based on a measurement, in a group of patients with the Prader-Willi Syndrome (PWS, excessive food intake), and a control group without eating disorders to register feelings of hunger. Both groups where consuming sandwiches and juice. Feelings of hunger where measured through an analogue scale and blood was taken for estimation of for instance CCK. The PWS group had high levels of CCK in their blood, but still they had hunger feelings. PWS has a pathological or genetic cause.

Summary of the invention

[0010] The present invention aims to aid and help people by an arrangement that provides a token of satiety or fullness. Some of these may eventually regain their skills of feeling satiety thus being free to dispose the arrangement, and others may have learnt to use the arrangement as a safeguard for a controlled dieting. It is emphasized that the arrangement of the present invention also could be utilized by persons regarded as healthy in order to keep a proper diet, thus for instance athletes could gain from utilizing the device as they have to keep a strict diet before a competition or sport event. Healthy persons with a body mass index (BMI) close to an upper value of a BMI limit are another example of a group that can use the arrangement to keep fit.

[0011] To solve problems and achieve the aims and goals of the present invention it sets forth a computerized handheld substantially pocket size device registering fullness and responding to fullness, utilized for aiding a person, in a controlled manner, to appreciate when to eat, comprising in-/output means, electronic memory, and a display screen. The invention thus comprises:

- a schedule for the persons eating training, prompting the person when to eat;
- a modified Borg type scale representing ratings of satiety on the screen;

a means for alerting the person to register through the input means felt satiety on the scale in a predetermined number of intervals following a food-intake;
a means for comparing the felt ratings with diagrams, stored in the device, showing expected felt satiety ratings specific times after a meal in order to be able to judge or compare to find out if the persons ratings deviate or adapt to those expected from the diagrams; and
at least one of an indicating and an alerting means acknowledging when food-intake is accepted within predetermined limits in accordance with the scale and its adaptation to the schedule, for the person through the result of the comparing, thus aiding the person in a smooth long term dieting contradicting extreme excessive short term dieting.

[0012] An embodiment of the present invention comprises that the scale at least partially is partitioned in incremental steps linguistically expressed in terms ranging from, approximately, no fullness to a maximum of fullness or in terms equivalent to those.

[0013] In one embodiment of the present invention, the device is used to register felt fullness during a meal.

[0014] Another embodiment comprises that the indicating means has a floating color scale within the Borg type scale indicating from less brighter colors to brighter colors after registering a felt fullness when eating is more and more recommended.

[0015] One embodiment comprises that the indicating means has a floating color scale within the Borg type scale indicating from brighter colors to less brighter colors after registering a felt fullness, when eating is more and more recommended.

[0016] A further embodiment comprises that the indicating means is a floating color scale within the Borg type scale indicating from less brighter colors to brighter colors after registering a felt fullness, and a switch switching at a predetermined brightness to a floating color scale within the Borg type scale indicating from brighter colors to less brighter colors after registering a felt fullness, when eating is more and more recommended.

[0017] A still further embodiment provides that the alerting means generates a vibration to the device due to the right to privacy of the person trying to cure a disorder.

[0018] Yet another embodiment that the predetermined limits allow the person to eat before a new meal is prompted by the schedule.

[0019] Another embodiment comprises that the prompting of meals from the schedule is accomplished only if a time for a next meal has been reached or passed.

Brief description of the drawings

[0020] Henceforth reference is had to the accompanying drawings for a better understanding of the present invention with its given examples and preferred embodiments, wherein:

Fig. 1 schematically illustrates a computerized device displaying a scale utilized in accordance with the present invention;
Fig. 2 illustrates a diagram of satiety during intake of food and satiety decreasing after food intake;
Fig. 3 schematically illustrates an embodiment of a floating alert indicating when it is suitable for a person to eat; and
Fig. 4 illustrates a diagram from clinical tests of satiety ratings of healthy women and women having anorexia.

Detailed description of preferred embodiments

[0021] The obese are typically motivated to eat, even though they are not hungry, because they fear that they may soon be in a situation where they will not be able to obtain food. They also report being hungry all of the time when they try to lose weight. These two factors doom most attempts at treatment.

[0022] The present invention provides a device (working name SatietyMeter) that aids people to learn, remember their satiety, or practice how to feel fullness or satiety, so that they can live a comfortable life or suppress or cure a prevailing eating disorder. In doing so it sets forth a preferably pocket sized computerized Personal Digital Assistant (PDA) or the like, Fig. 1. The PDA is a conventional device 10 having a pointer means 12 for manipulation of functions, in-/output and the like shown on a display screen 14, and possibly equipped with buttons 16 for in-/output or a keypad.

[0023] To provide the device for remembering or teaching satiety to persons that need such a feature, the device 10 comprises specific software residing in the device 10 electronic memory space. This software or computer program creates a scale 18 on the display 14. It also keeps a schedule/scheme regarding a person's specific eating training and/or physical training. An eating training schedule may look as the following for a specific person:

08:00	breakfast
10:30	snack
12:15	lunch
15:30	snack
18:00	dinner
20:00	evening meal

[0024] This schedule could be entered into the device software by the person's personal therapist/trainer, or once entered as a template for most persons utilizing the device. Moreover, the person utilizing the device could be prompted on the display when to eat a meal, for example, like "Time for your 12:15 lunch".

[0025] The scale 18 is a type of modified Borg scale 18 preferably divided in even steps of for instance 0,0 to

100 incremented in steps of 0,1 (1/10), or other suitable scale steps for performing the specific task. To guide a person who uses the device 10, the scale 18 is highlighted, at specific locations of it, with prompting text for input of felt satiety by a person.

[0026] The prompting text, in one embodiment, suggests, for example, "Rate your fullness", and levels in the scale 18 from 0,0 to 100 are identifying ratings of fullness such as for instance not at all, extremely weak, very weak, weak, moderate, strong, very strong, extremely strong, and maximal fullness, see Fig. 1. It is appreciated that other wordings may be used, but the underlying principle prevails. Also, in a simple embodiment, the scale 18 could be provided with its numerical rating values, for example, 0,0; 0,1; 0,2...99,8; 99,9; 100 or the like. Although the scale 18 is depicted as a pile in Fig. 1, it could as well be presented as any other suitable graphic such as a circular pie diagram, serpentine, a person graphic, animals, plants, houses and other. The scale 18 may also have other ranges and division of scale steps including narrower steps for specific ratings as for instance in the moderate region or any other suitable region as obvious for a person skilled in the art. There are unlimited varieties of graphics that can be used to represent the scale 18, and it should be kept in mind that they can provide extra joy to children using the device.

[0027] It should be noted that the concept of rating satiety or fullness could in one embodiment of the present invention as well be changed to a rating of feeling hunger. These ratings are compared for instance with diagrams, stored in the device software, showing expected satiety or hunger specific times after a meal such as shown in Fig. 2 and Fig. 4 in order to be able to judge or compare with the ratings made on the device by a test person or patient to find if there ratings deviate or adapt to those expected from the diagrams.

[0028] In one embodiment of the present invention predetermined limits allow a person to eat before a new meal is prompted by the schedule. In this manner the person is adapting to his/her own inbuilt biological clock for eating, where for instance lunch should be around 12:00 a.m., which is very close to 12:15 p.m. where the person perhaps should be prompted for lunch. Such a behavior is then appreciated in training or treating a person to eat more correct. Else, if a person tried to eat 11:30 it would not be that wanted in the sense of a treatment or training session. A message displayed on the device 10 display 14 could then be " You are feeling hungry, but you should not already be that hungry. Your next scheduled meal is: Lunch 12:15.

[0029] Try to fight your hunger! Here follows some suggestions of what you could do to master the situation."

[0030] Another embodiment comprises that the prompting of meals from the schedule is accomplished only if a time for a next meal has been reached or passed.

[0031] While conducting clinical tests, further elucidated below, on obese children it turned out that they quickly embraced the device and enjoyed using it. This notion is important as there are severe health problems related to obesity in children as it is not unusual that a child, not even ten years old, can weigh more than 100 kg.

[0032] The device 10 in one embodiment is equipped with a card receiver and slot (not shown), whereby recordings of satiety for a later evaluation can be stored on the card. It is also possible to store recorded information in a stationary device 10 memory.

[0033] A possible session for a person to register a satiety rating after a meal could have duration of two hours, whereby the person would be asked, for example, once every 15 minutes, seven rating attempts, to register satiety. The device 10 alerts the person every 15 minutes through a sound or preferably by vibrations that it is time to register satiety. Clinical tests as mentioned showed that persons using the device 10 found it embarrassing that others had knowledge of what was going on due to sounds that alerted the person, and thus rather preferred to register ratings in privacy which can be achieved when accomplishing alerting through vibrations.

[0034] On the display screen 14 the scale 18 pops up when a registration is alerted and the user points with the pointing means 12 on the scale 18 displayed on the display screen 14 to register the felt satiety at the actual time after a meal.

[0035] Fig. 2 illustrates a diagram measuring satiety during a meal to the left of the broken line boarder; the boarder divides a 100 percent food intake from a measurement of satiety after food intake in the same diagram. The diagram in Fig. 2 makes it clear that neither food intake related to satiety nor the duration of satiety after food intake is a linear function. The diagram can be used to show or convince a person that registers strange ratings (in relation to normal) that it is impossible for instance to rate satiety to very weak 15 minutes after having rated satiety to maximal. Of course scientists are helped to draw conclusions of registered ratings in relation to the type of eating disorder and the number of people that register out of diagrams like that shown in Fig. 2. There is no absolute knowledge or formula of what guides the notion of satiety more than that it is biologically conditioned. Hence, registered data from a vast population of users of the device would answer many questions.

[0036] In Fig. 3 one embodiment of a floating color scale is depicted, the person rating her/ his satiety is provided a recommendation of when to take the next meal. For example when a person starts to rate, the first satiety rating would probably be high, close to maximal. This could be represented by a less bright green color (A in Fig. 3) to indicate that it is not "green" to take your next meal yet. As time passes and the ratings of satiety become lower the green color gets brighter (B to A in Fig. 3) in a floating manner, which indicates that it is more and more acceptable to eat.

[0037] - The present invention comprises means for comparing felt ratings with diagrams such as shown in Fig. 2 and 4, stored in the device, showing expected felt satiety ratings specific times after a meal in order to be

able to judge or compare to find out if a persons ratings deviate or adapt to those expected from the diagrams. Moreover, the present invention comprises at least one of an indicating and an alerting means acknowledging when food-intake is accepted within predetermined limits in accordance with the scale and its adaptation to the schedule, for the person through the result of the comparing. Hence, providing the person an aid in a smooth long term dieting, in contradiction to extreme excessive short term dieting. The predetermined limits could be introduced as described below with colors, numerical ratings, expressions as in Fig. 1 or the like.

[0038] This floating color could in another embodiment of the invention be combined with at least two colors, for example red and green. The embodiment could begin with a very bright red color for high ratings of satiety meaning "do not eat". As satiety declines the red color becomes less and less bright to a turning point, for example, at the rating moderate satiety in the scale 18, where the color switches to a less bright green color meaning "it is not entirely forbidden to eat", whereby the green color gets greener and greener saying "please do eat".

[0039] In a further embodiment multiple colors could be used to illustrate the floating color scale such as for instance red, yellow, and green similar to the color combination of traffic lights, which are familiar to most persons.

[0040] Additionally, the floating colors could be combined with flashing icons and/or sound or the like on the screen 14 telling a user when to eat. In a very simple embodiment no color scale is provided but only a sound and/or flashing icon to tell a user to eat.

[0041] It is appreciated that the scale 18 could be reversed in its appearance on the screen 14.

[0042] Clinical studies mentioned have shown that an obese person can lose approximately 0,2 kg a week by using the device of the present invention to guide when to eat.

[0043] While the Mandometer®, trademark of the device disclosed in US patent 5,817,006 to Bergh et al, is effective in giving feedback regarding satiety during meals, the SatietyMeter or device 10 of the present invention allows feedback to be given regarding satiety levels between meals. Since patients often say they eat because they are bored or because they have nothing else to do, this kind of information makes it possible for patients to stop eating between meals. A patient carries a SatietyMeter of the present invention in her/his pocket and the unit signals every 15 minutes between meals to elicit an estimate the level of satiety. If the patient rates her/his level of satiety as weak, or very weak, she/he would be expected to eat. However, if the satiety estimate is average, or above average, the patient is expected to refrain from eating. The SatietyMeter thereby makes the patient consider if she/he actually is hungry before eating. Patients learn to identify those times between meals when they eat for reasons other than hunger.

[0044] As a patient reduces her/his body weight, the stomach adapts and the feeling of fullness is experienced earlier during the meal. Thus, the perception of hunger and satiety can be modified with Mandometer® and the SatietyMeter of the present invention to establish new patterns of behavior. A change in environment is often necessary to eliminate environmental cues that maintain old habits with regard to food intake and activity and it is often easier to eliminate old behaviors in a new environment than in the one in which it was developed. Starting the program while staying with a relative or friend over a weekend may help these new behaviors to be established.

Clinical test

[0045] A pilot trial with nine morbidly obese children (BMI at least 35 kg/m^2) is ongoing at the Department of Pediatric Endocrinology, Bristol Royal Hospital for Children, University of Bristol, England. The children are 12-18 years old and they have been treated unsuccessfully with the standard of care for at least one year. All but one have responded to the Mandometer® treatment, with a total weight loss ranging from 2-9 kg in up to three months of treatment. They feel "they are not on a diet" and have "stopped snacking" between meals. "The SatietyMeter makes me think that I don't have to eat" is another comment repeatedly heard. Their eating rate has decreased and the feeling of fullness starts earlier in the meal than it did before treatment. There is also an improvement of their self-esteem, they have started to socialize with peers, they watch less TV (from 6 to 2 hr/day), and they have increased their physical activity.

[0046] Fig. 4 shows in a diagram that the satiety ratings of healthy women decline after a meal. By contrast, anorexic women rate their satiety as much higher after a meal than healthy women despite eating less food and they also continue to rate their satiety as higher during a two hour period after the meal.

[0047] Fig. 4 depicts satiation in 24 control women (19.8, range: 18-21, years old) and 5 anorexic women (16, range: 14-17, years old) at different times after intake of 282 (range: 154-452) and 111 (range: 54-154) g food in 8.6 (range: 5.3-12) and 16.6 (range: 14-21) min, respectively. Values are medians. Measures of variability are omitted to facilitate visual inspection. The verbal expressions on the satiety curve are in accordance with the present invention: none at all, very weak, etc corresponding to numerical values: 0-100. The scientific test data of Fig. 4 has not yet been made available to the public.

[0048] The present invention has been described through examples and embodiments not intended to limit the scope of the invention. Hence, the invention is determined through its attached set of claims, which in addition suggests further embodiments to a person skilled in the art.

Claims

1. A computerized handheld substantially pocket size device (10) for satiety registering and response to satiety, utilizable in aiding a person, in a controlled manner, to appreciate when to eat, comprising in-/output means (12, 16), electronic memory, a display screen (14),
a schedule for said persons eating training configured to prompt said person when to eat;
a modified Borg type scale (18) representing ratings of satiety on said screen;
a means for alerting said person to register through said input means felt satiety on said scale in a predetermined number of intervals following a food-intake;
a means for comparing said felt ratings with diagrams, stored in the device, showing expected felt satiety ratings specific times after a meal in order to be able to judge or compare to find out if said persons ratings deviate or adapt to those expected from the diagrams; and
at least one of an indicating and an alerting means acknowledging when food-intake is accepted within predetermined limits in accordance with said scale and its adaptation to the schedule, for said person through the result of said comparing, thus aiding said person in a smooth long term dieting contradicting extreme excessive short term dieting.

2. A device (10) according to claim 1, wherein said scale (18) at least partially is partitioned in incremental steps linguistically expressed in terms ranging from approximately no satiety to a maximum of satiety or in terms equivalent to those said device also being usable to register felt satiety during a meal.

3. A device (10) according to claim 1 or 2, wherein said indicating means is a floating color scale (A, B, C) within said modified Borg type scale (18) indicating from less brighter colors to brighter colors after registering a felt satiety, indicating when eating is more and more recommended.

4. A device according to claim 1 or 2, wherein said indicating means is a floating color scale (A, B, C) within said modified Borg type scale (18) indicating from brighter colors to less brighter colors after registering a felt satiety, indicating when eating is more and more recommended.

5. A device according to claim 1 or 2, wherein said indicating means is a floating color scale (A, B, C) within said Borg type scale (18) indicating from less brighter colors to brighter colors after registering a felt satiety, and a color switch switching at a predetermined brightness to a floating color scale within said modified Borg type scale indicating from brighter colors to less brighter colors after registering a felt satiety, indicating when eating is more and more recommended.

6. A device according to claim 1-5, wherein said alerting means is configured to generate a vibration to said device due to the right to privacy for said person trying to cure a disorder.

7. A device according to claim 1-6, wherein said predetermined limits allow said person to eat before a new meal is prompted by said schedule.

8. A device according to claim 1-5, wherein said prompting of meals from said schedule is accomplished only if a time for a next meal has been reached or passed.

Patentansprüche

1. Computergestützte, tragbare, im Wesentlichen taschengroße Vorrichtung (10) zur Eingabe von Sättigung und Reaktion auf Sättigung, verwendbar, um eine Person auf eine kontrollierte Weise bei einer Beurteilung, wenn sie essen soll, zu unterstützen, wobei die Vorrichtung aufweist:

Ein/Ausgabe-Einrichtungen (12,16);
einen elektronischen Speicher;
einen Anzeigebildschirm,;
einen Plan für das persönliche Esstraining, der die Person auffordert, wenn sie essen soll;
eine modifizierte Borg-Skala (18), die Sättigungseinschätzungen an dem Bildschirm darstellt;
eine Einrichtung, um die Person in einer vorgegebenen Anzahl von Intervallen nach einer Nahrungsaufnahme zu alarmieren, über die Eingabeeinrichtung an der Skala eine gefühlte Sättigung einzugeben;
eine Einrichtung zum Vergleichen der gefühlten Einschätzungen mit Diagrammen, die in der Vorrichtung gespeichert sind und die die zu erwartenden gefühlten Sättigungseinschätzungen bestimmte Zeiten im Anschluss an ein Mahl zeigen, um beurteilen oder vergleichen zu können, um herauszufinden, ob die persönlichen Einschätzungen mit den aus den Diagrammen zu erwartenden übereinstimmen oder davon abweichen; und
mindestens eine Anzeige- und/oder Alarmeinrichtung, die der Person aus dem Ergebnis des Vergleichs bestätigt, wenn Nahrungsaufnahme innerhalb vorgegebener Grenzen in Übereinstimmung mit der Skala und ihrer Anpassung an den Plan erlaubt ist, um dadurch die Person bei einer sanften Langzeitdiät zu unterstützen, im

Gegensatz zu einer sehr übertriebenen Kurzzeitdiät.

2. Vorrichtung (10) nach Anspruch 1, wobei die Skala (18) zumindest teilweise in ansteigende Stufen unterteilt ist, die sprachlich in Begriffen, die von annähernd keine Sättigung bis maximale Sättigung reichen, oder in dazu äquivalenten Begriffen ausgedrückt sind.
wobei die Vorrichtung auch verwendbar ist, um während eines Mahls die gefühlte Sättigung einzugeben.

3. Vorrichtung (10) nach Anspruch 1 oder 2, wobei die Anzeigeeinrichtung eine gleitende Farbskala (A,B, C) innerhalb der modifizierten Borg-Skala (18) ist, die nach Eingabe einer gefühlten Sättigung von weniger hellen Farben zu helleren Farben anzeigt, dass mehr und mehr empfohlen wird, zu essen.

4. Vorrichtung nach Anspruch 1 oder 2, wobei die Anzeigeeinrichtung eine gleitende Farbskala (A,B,C) innerhalb der modifizierten Borg-Skala (18) ist, die nach Eingabe einer gefühlten Sättigung von helleren Farben zu weniger hellen Farben anzeigt, dass mehr und mehr empfohlen wird, zu essen.

5. Vorrichtung nach Anspruch 1 oder 2, wobei die Anzeigeeinrichtung eine gleitende Farbskala (A,B,C) innerhalb der modifizierten Borg-Skala (18), die nach Eingabe einer gefühlten Sättigung von weniger hellen Farben zu helleren Farben anzeigt, und ein Farbschalter ist, der bei einer vorgegebenen Helligkeit zu einer gleitenden Farbskala in der modifizierten Borg-Skala umschaltet, die nach Eingabe einer gefühlten Sättigung von helleren Farben zu weniger hellen Farben anzeigt, dass mehr und mehr empfohlen wird, zu essen.

6. Vorrichtung nach Anspruch 1 bis 5, wobei die Alarmeinrichtung die Vorrichtung in Vibration versetzt, um die Privatsphäre der Person, die eine Störung zu heilen versucht, zu wahren.

7. Vorrichtung nach Anspruch 1 bis 6, wobei die vorgegebenen Grenzen es der Person erlauben zu essen, bevor sie von dem Plan zu einem neuen Mahl aufgefordert wird.

8. Vorrichtung nach Anspruch 1 bis 5, wobei die Aufforderung zu Mahlzeiten durch den Plan nur erfolgt, wenn ein Zeitpunkt für eine nächste Mahlzeit erreicht oder überschritten worden ist.

Revendications

1. Dispositif informatisé portable au format sensiblement de poche (10) destiné à enregistrer un niveau de satiété et à répondre à cette satiété, utilisable en vue d'aider une personne à déterminer, d'une manière contrôlée, un moment propice à une ingestion d'aliments, comprenant un moyen d'entrée /sortie (12, 16), une mémoire électronique, un écran d'affichage (14),
un programme d'apprentissage alimentaire personnel configuré de manière à indiquer à ladite personne un moment propice à un repas ;
une échelle de type Borg modifiée (18) représentant des évaluations de satiété sur ledit écran ;
un moyen d'alerte pour inciter ladite personne à enregistrer, par le biais dudit moyen d'entrée, une sensation de satiété sur ladite échelle, sur un nombre prédéterminé d'intervalles à la suite d'une ingestion d'aliments ;
un moyen pour comparer lesdites évaluations de sensation de satiété à des schémas, stockés dans le dispositif, indiquant des évaluations de sensation de satiété attendues à des instants spécifiques à la suite d'un repas, afin d'être en mesure de déterminer ou de comparer si lesdites évaluations personnelles s'écartent ou correspondent à celles attendues des schémas ; et
au moins l'un d'un moyen d'indication et d'un moyen d'alerte indiquant à quel moment une ingestion d'aliments est acceptée dans des limites prédéterminées selon ladite échelle et son adaptation au programme, pour ladite personne, par l'intermédiaire du résultat de ladite comparaison, aidant ainsi ladite personne à suivre un régime à long terme mesuré, par opposition à un régime extrême à court terme excessif.

2. Dispositif (10) selon la revendication 1, dans lequel ladite échelle (18) est au moins partiellement segmentée par stades incrémentiels exprimés linguistiquement en des termes allant d'une absence relative de satiété à une satiété maximale, ou en des termes équivalents à ces derniers,
ledit dispositif étant également utilisable pour enregistrer une sensation de satiété au cours d'un repas.

3. Dispositif (10) selon la revendication 1 ou 2, dans lequel ledit moyen d'indication est une échelle en dégradé de couleurs (A, B, C), dans ladite échelle de type Borg modifiée (18), représentant une palette de couleurs allant des couleurs les moins vives aux couleurs les plus vives, suite à l'enregistrement d'une sensation de satiété, indiquant le moment où une ingestion d'aliments est de plus en plus recommandée.

4. Dispositif selon la revendication 1 ou 2, dans lequel ledit moyen d'indication est une échelle en dégradé de couleurs (A, B, C), dans ladite échelle de type Borg modifiée (18), représentant une palette de couleurs allant des couleurs les plus vives aux couleurs les moins vives, suite à l'enregistrement d'une sen-

sation de satiété, indiquant le moment où une ingestion d'aliments est de plus en plus recommandée.

5. Dispositif selon la revendication 1 ou 2, dans lequel ledit moyen d'indication est une échelle en dégradé de couleurs (A, B, C), dans ladite échelle de type Borg (18), représentant une palette de couleurs allant des couleurs les moins vives aux couleurs les plus vives suite à l'enregistrement d'une sensation de satiété, et un commutateur de couleur basculant, à une teinte prédéterminée, sur une échelle en dégradé de couleurs, dans ladite échelle de type Borg modifiée, représentant une palette de couleurs allant des couleurs les plus vives aux couleurs les moins vives suite à l'enregistrement d'une sensation de satiété, indiquant le moment où une ingestion d'aliments est de plus en plus recommandée.

6. Dispositif selon l'une quelconque des revendications 1 à 5, dans lequel ledit moyen d'alerte est configuré de manière à générer une vibration sur ledit dispositif permettant le respect de la vie privée de ladite personne qui tente de soigner un dérèglement d'une fonction pathologique.

7. Dispositif selon l'une quelconque des revendications 1 à 6, dans lequel lesdites limites prédéterminées permettent à ladite personne de manger avant qu'un nouveau repas soit incité par ledit programme.

8. Dispositif selon l'une quelconque des revendications 1 à 5, dans lequel ladite incitation à la prise de repas par ledit programme est mise en oeuvre uniquement si une heure correspondant à la prise d'un repas successif a été atteinte ou dépassée.

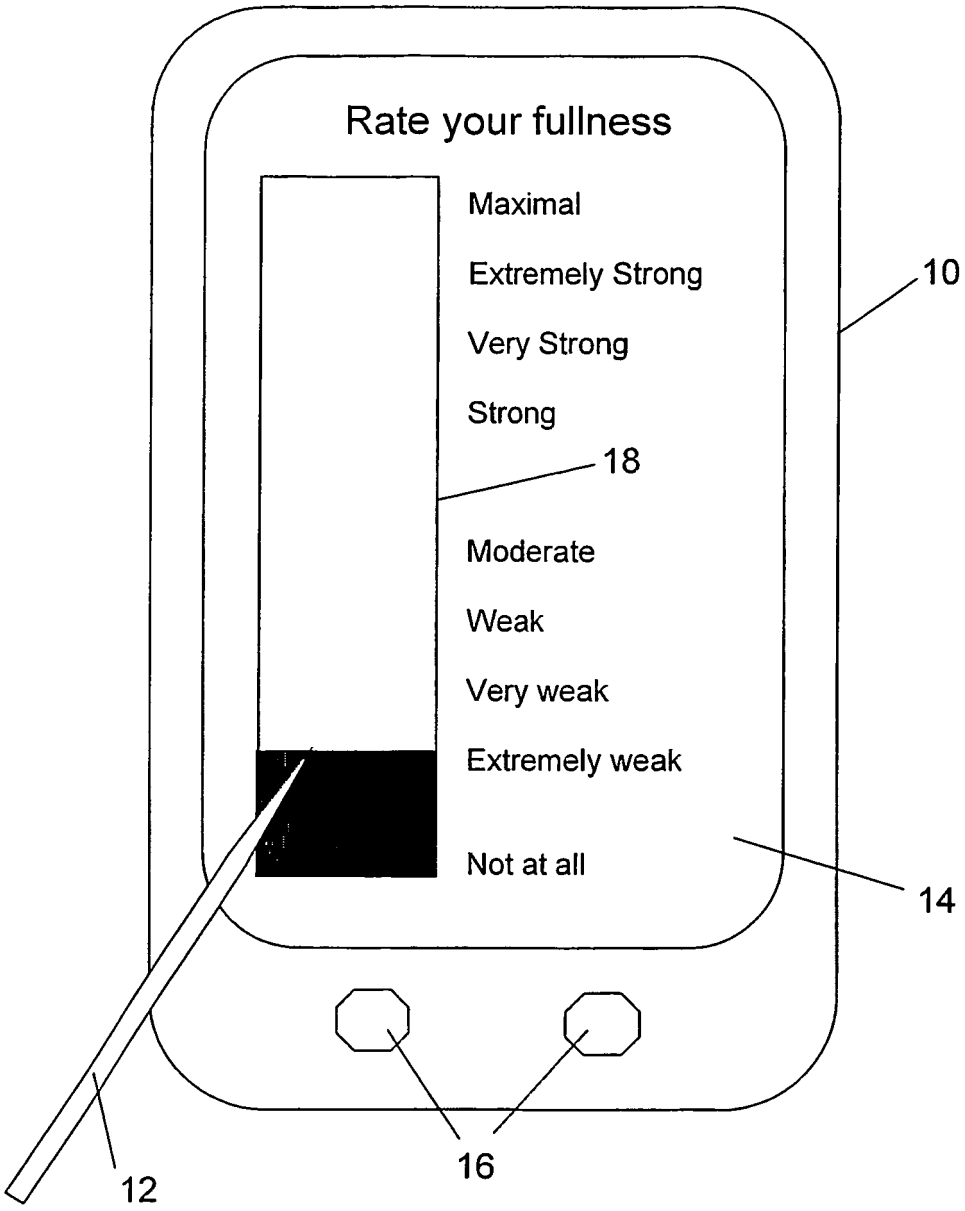
Rate your fullness
Maximal
Extremely Strong
Very Strong
Strong
Moderate
Weak
Very weak
Extremely weak
Not at all
10
14
16
18
12

Fig. 1

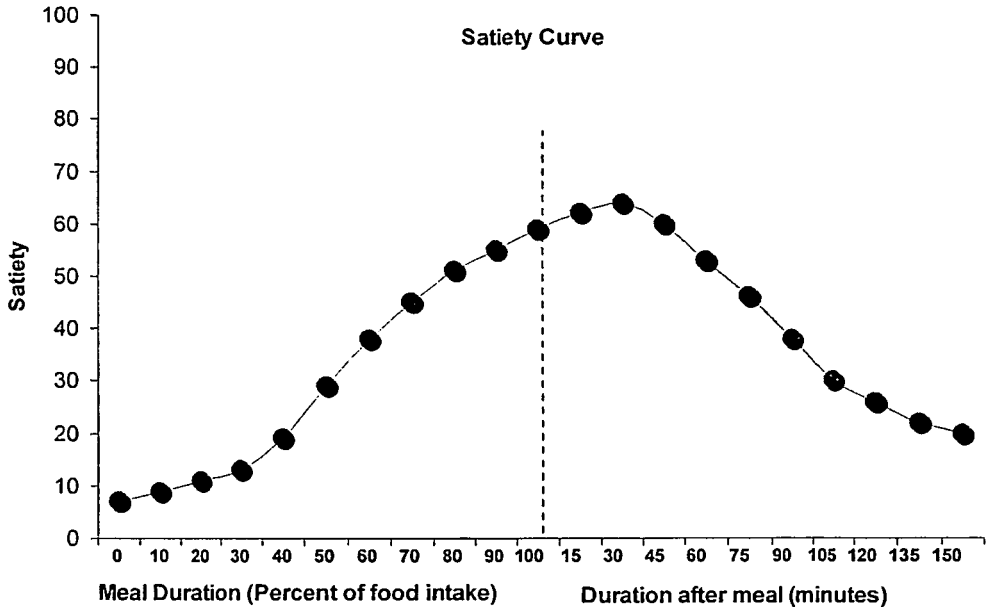
Satiety Curve
Satiety
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100 15 30 45 60 75 90 105 120 135 150
Meal Duration (Percent of food intake)
Duration after meal (minutes)

Fig. 2

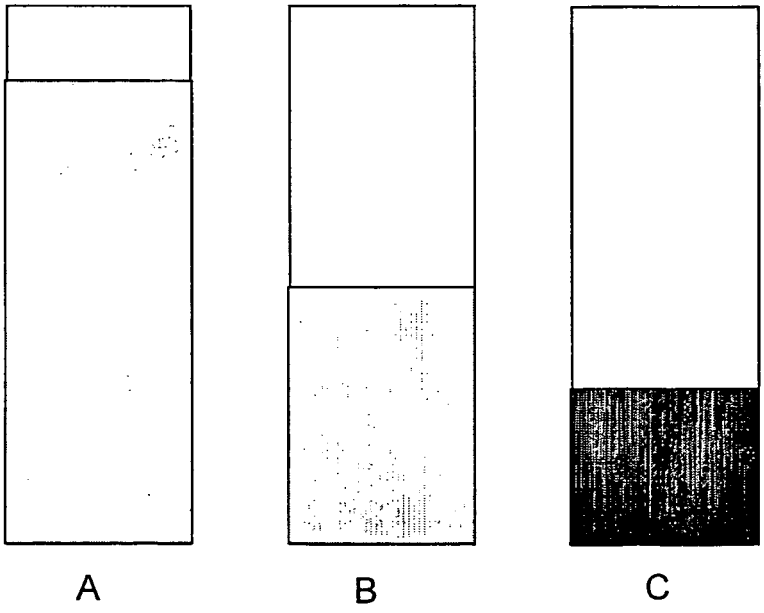
A
B
C

Fig. 3

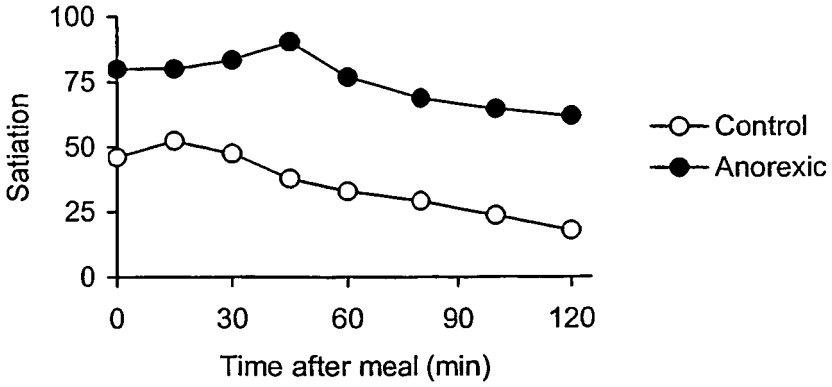
100
75
50
25
0
Satiation
0
30
60
90
120
Time after meal (min)
Control
Anorexic

Fig. 4

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 0794727 A **[0006]**
- US 5817006 A, Bergh **[0006] [0043]**

Non-patent literature cited in the description

- A category scale with ratio properties for intermodal and individual comparisons. **BORG G.** psychophysical Judgment and the process of perception. Springer Verlag, 1982, 25-34 **[0005]**
- Randomized controlled trial of a treatment for anorexia and bulimia nervosa. *Proceedings of The National Academy of Science,* 09 July 2002, 9486-9491 **[0007]**
- A new treatment of anorexia nervosa. *The Lancet,* 1996, vol. 348 (9027), 611-612 **[0007]**
- **HOLLAND et al.** Measurement of Excessive Appetite and Metabolic Changes in Prader-Willi Syndrome. *International Journal of Obesity,* 1993, vol. 17 (9), 527-532 **[0009]**

专利名称(译)	饱和度计		
公开(公告)号	EP1641385B1	公开(公告)日	2013-03-27
申请号	EP2004749141	申请日	2004-07-06
[标]申请(专利权)人(译)	曼朵计量公司		
申请(专利权)人(译)	MANDOMETER AB		
当前申请(专利权)人(译)	MANDOMETER AB		
[标]发明人	BERGH CECILIA SODERSTEN PER ZANDIAN MICHEL		
发明人	BERGH, CECILIA SÖDERSTEN, PER ZANDIAN, MICHEL		
IPC分类号	A61B5/00 A23L33/00		
CPC分类号	A23L33/30 Y10S128/921 A61B5/00		
优先权	0301997 2003-07-07 SE		
其他公开文献	EP1641385A1		
外部链接	Espacenet		

摘要(译)

本发明涉及一种用于饱腹感记录和饱腹感响应的计算机化手持式基本上口袋大小的装置（10）。它用于以受控的方式帮助人们欣赏何时进食，包括输入/输出装置（12,16），电子存储器，显示屏（14）和改进的Borg型秤（18）。饱腹感。

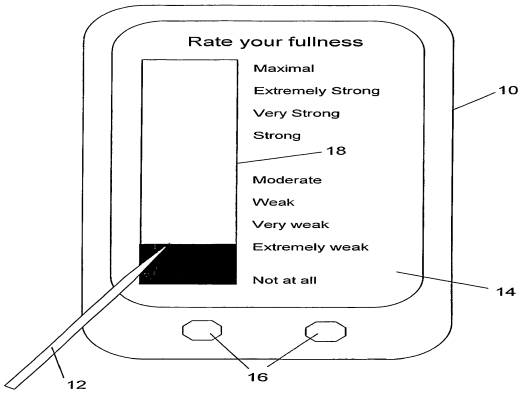

Fig. 1