

Device, system and method for characterising a motion pattern

Citation for published version (APA):

Wijkstra, H., Meuleman, E. J. H., & Philippi, J. G. M. (2003). Device, system and method for characterising a motion pattern. (Patent No. WO03005904).

Document status and date:

Published: 23/01/2003

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 January 2003 (23.01.2003)

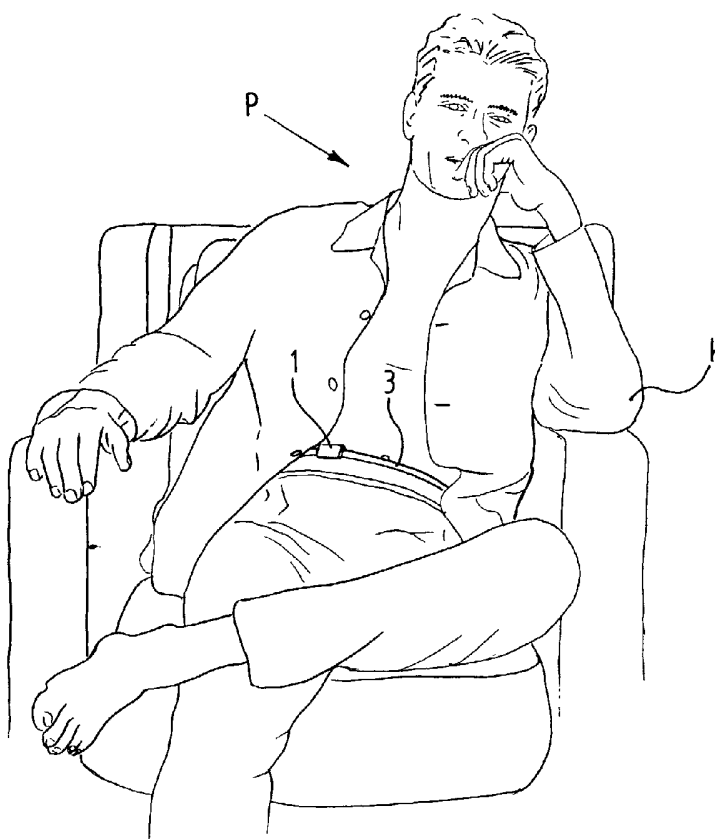
PCT

(10) International Publication Number
WO 03/005904 A2

- (51) International Patent Classification⁷: **A61B 5/11** (NL). MEULEMAN, Eric, Johan, Hermann [NL/NL]; Groesbeekseweg 450, NL-5423 PR Nijmegen (NL). PHILIPPI, Johannes, Gerardus, Maria [NL/NL]; Geison 6, NL-6641 NX Beuningen (NL).
- (21) International Application Number: PCT/NL02/00466
- (22) International Filing Date: 12 July 2002 (12.07.2002)
- (25) Filing Language: Dutch
- (26) Publication Language: English
- (30) Priority Data: 1018530 12 July 2001 (12.07.2001) NL
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: DEVICE, SYSTEM AND METHOD FOR CHARACTERISING A MOTION PATTERN



(57) Abstract: The present invention relates to a device for characterizing the sexual disfunction of a person, comprising: a holder; means for attaching the holder to the person; means arranged in the holder for determining during use the motion pattern of the person, which motion pattern-determining means comprise: at least one acceleration transducer for determining the acceleration values in at least one direction of the movements performed by the person as a function of time. The invention also relates to a method for characterizing the sexual disfunction of a person, comprising of: attaching at least one acceleration transducer to the body of the person; measuring the acceleration values of the body of the person in at least one direction as a function of time; determining the time duration between penetration and ejaculation by the person on the basis of the measured acceleration values.

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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *without international search report and to be republished upon receipt of that report*

**DEVICE, SYSTEM AND METHOD FOR
CHARACTERIZING A MOTION PATTERN**

The present invention relates to a device, assembly and method for characterizing the sexual disfunction of a person.

Within the group of patients with sexual problems ejaculatio praecox or premature ejaculation is a significant problem. A number of methods are known for researching the behaviour of the patient during sexual intercourse. It can for instance be deemed known to manually record the time between penetration and the moment of ejaculation using a stopwatch. The number of thrusts from penetration to ejaculation can also be counted. The thus obtained data can give an indication of the degree of ejaculatio praecox.

A drawback of the above method is, that it is not objective, since it is carried out by the patient himself or by his partner. The manner of recording moreover influences the behavioural pattern of the patient. The recorded motion pattern of the patient is no longer representative of the usual pattern and can therefore hardly be used for an objective determination of the degree of ejaculatio praecox.

It is an object of the present invention to provide a method and device wherein the above stated drawbacks are obviated and with which the behavioural pattern of a patient can be recorded in objective manner.

According to a first aspect of the invention a device is provided for characterizing the sexual disfunction of a person, comprising:

- a holder;
- means for attaching the holder to the person;
- means arranged in the holder for determining during use the motion pattern of the person, which motion pattern-determining means comprise:

- at least one acceleration transducer for determining the acceleration value in at least one direction of the movements performed by the person as a function of time. On the basis of the progression in time of the acceleration value (n), an objective picture can be obtained of the behaviour of the patient during sexual intercourse. When a single acceleration transducer is applied, the patient must take care that the device, i.e. the acceleration transducer, is oriented in a correct manner relative to his body during sexual intercourse. When the acceleration transducer is for instance oriented during sexual intercourse such that an acceleration perpendicularly of the main direction of movement of the patient is measured, this can result in an undesired outcome of the measurements. According to a preferred embodiment of the invention the device therefore comprises a first acceleration transducer for determining the acceleration in a first direction and a second acceleration transducer for determining the acceleration in a second direction substantially transversely of the first direction. By determining the acceleration in two (or more) directions, determining of the motion pattern becomes less dependent on the position of the acceleration transducers of the device. This means that the freedom of movement of the patient becomes greater and he no longer has to worry about the correct position of the device on his body. This enhances the objectivity of the measurements.

According to a further preferred embodiment, storage means are arranged in the holder for storing the acceleration values determined as a function of time. By storing the acceleration values, a transmission cable to an external storage can for instance be omitted. This increases the user comfort of the device, and thereby the objectivity of the measurements.

According to a further preferred embodiment the device comprises transmission means for sending the stored acceleration values of at least one of the acceleration transducers to an external processing unit.

5 Depending on the storage capacity of the storage means, data is sent in the interim, or only afterward, to an external processing unit, such as for instance a personal computer, where a further processing of the measurement data can take place.

10 In further preferred embodiments means are provided for measuring one or more physiological signals generated by the person, preferably means for measuring the heart rate and/or the electrical resistance of the skin of the person. On the basis of the measured
15 physiological signals the research into the degree of ejaculatio praecox or the causes thereof can be expanded in combination with the determined motion pattern of the patient.

According to a second aspect of the present
20 invention a system is provided for characterizing the sexual disfunction of a person, comprising:

- a holder provided with means for attaching the holder to the person, in which holder are arranged means for determining the motion pattern of the person in the
25 situation where it is attached to the person, which motion pattern-determining means comprise at least one acceleration transducer for determining the acceleration value of the movements performed by the person in at least one direction as a function of time;

30 - an external processing unit for processing the determined acceleration values, which is adapted to determine at least the time duration between penetration and ejaculation by the person; wherein the holder and the processing unit are provided with transmission means
35 for sending the acceleration values for processing from the holder to the processing unit. The external processing unit is for instance a computer in which,

under the control of software suitable for this purpose, the results of the acceleration measurements are processed into information which can be used by the attending doctor, including the time duration between penetration and ejaculation by the person, the number of thrusting movements performed by the person between penetration and ejaculation, the thrust density (i.e. the number of thrusts as a function of time), the determination of the maximum and minimum acceleration or speed per thrust as a function of time, the path covered per thrust, and so on. Herefrom can then be determined quantities such as the work done per thrust as a function of time, the maximum/minimum power of a thrust as a function of time and the like. The transmission means are preferably embodied such that wireless communication, preferably radio communication or infrared communication, is possible. The freedom of movement of the patient hereby remains maximal.

According to a further preferred embodiment the device comprises three acceleration transducers extending substantially transversely of each other for determining the acceleration in three directions substantially transversely of each other, wherein the processing unit is adapted to determine the speed and/or position of the person as a function of time. Through a single or double integration of the determined acceleration data, the speed and the position respectively of the patient during sexual intercourse can be determined. This is also information which can be useful to the attending doctor.

According to a third aspect of the present invention a method is provided for characterizing the sexual disfunction of a person, comprising of:

- attaching at least one acceleration transducer to the body of the person;

- measuring the acceleration values of the body of the person in at least one direction as a function of time;

- determining the time duration between penetration and ejaculation by the person on the basis of the measured acceleration values.

Further advantages, features and details of the present invention will be elucidated on the basis of the following description of a preferred embodiment thereof.
10 Reference is made in the description to the annexed figures, in which:

Figure 1 shows a perspective view of a person to whom a preferred embodiment of the device according to the invention is attached; and

15 Figure 2 shows a partly cut-away perspective view of the preferred embodiment of figure 1.

The device, further referred to as actometer 1 hereinbelow, can be attached round the waist of a test subject P using a belt 3. Actometer 1 is herein arranged directly onto the skin of the person, i.e. under the clothing K of the person, for the sake of user comfort.
20 In one embodiment (not shown) the actometer can be arranged on the clothing K by means of velcro or be arranged directly on the skin using plasters or the like. The manner of attachment to the body is not critical for the operation of the actometer itself. It is however possible to envisage also providing the actometer with measuring sensors for measuring specific physiological signals, such as for instance the
25 resistance of the skin, the heart rate and so on. In this embodiment it may however be important to place the actometer directly onto the skin of test subject P.

Actometer 1 comprises a housing 2 for fastening to test subject P using a belt 3. In housing 2 are placed
35 three acceleration transducers 4, 5, 6 with which the acceleration can be measured in three directions substantially perpendicular to each other. For this

purpose the acceleration transducers are connected to a microcontroller 7, to which a number of memories 8 are also connected. Microcontroller 7, acceleration transducers 4-6 and memory 8 are powered with a battery 9 (for instance a lithium button cell of about 3 Volts).

Actometer 1 can be activated using a switch arranged on housing 2 or using a remote control. In the latter case actometer 1 is provided with an infrared port 11 whereby infrared communication can be realized between microcontroller 7 and said remote control. After activation the movements of the test subject are recorded using acceleration transducers 4, 5 and 6. The signals from acceleration transducers 4, 5, 6 are stored via microcontroller 7 in internal memory 8 and after the end of the measurement are transmitted to a storage medium of greater capacity (not shown), for instance the hard disk of a personal computer. Transfer of the content of memory 8 takes place via output port 10, on which an electrical connection between the personal computer and actometer 1 can be established in known manner. It is also possible to transfer the data from memory 8 to the personal computer via infrared port 11.

Depending on the capacity of memory 8, actometer 1 is optionally deactivated after ejaculation. In the case of a sufficiently large memory capacity, actometer 1 can remain activated until the memory is completely filled. In the case of a smaller memory capacity, it is advisable to deactivate the actometer after each ejaculation and optionally reactivate it at a later time.

Although an embodiment with internal memory 8 is recommended, it is also possible to envisage omitting a storage in the actometer or providing only a temporary storage. In such a case the measured acceleration values are sent almost immediately from the actometer to the external storage medium.

In other preferred embodiments the actometer is simplified by omitting one or two acceleration transducers. When one acceleration transducer is applied, the acceleration can be determined in a first direction and, when two actometers are used, the acceleration in a first and a second direction. It has been found that determining of the acceleration in one direction is sufficient to enable the time between penetration and ejaculation to be established afterward. Furthermore, the number of thrusts can be counted from the measurement results of a single acceleration transducer. When two or more acceleration transducers are used the accuracy as well as the objectivity of the measurement increases, as set forth above.

In addition to quantities such as the time between successive thrusts, the maximum/minimum/average speed/acceleration per thrust, the maximum/minimum/average power per thrust, the path covered per thrust and the like, quantities such as the moment of actual penetration and ejaculation, the time therebetween and other derived quantities can also be determined directly or indirectly, for instance in the form of a suitable statistical signal analysis.

When three acceleration transducers are applied, it is for instance possible to envisage having the personal computer determine, from the measured accelerations, the speed and even the relative position and/or the path covered and/or the path covered by actometer 1 under the control of appropriate software. This can further assist the doctor in determining the possible cause of the sexual problem.

In a further preferred embodiment the actometer is provided with a sensor for measuring the skin resistance, the heart rate or other physiological parameters of the person. The values of these parameters can be stored in memory 8 simultaneously with the determining of the accelerations and be read out

afterward. The heart rate of test subject P is for instance a measure for the degree of excitement of the test subject. The skin resistance depends for instance on the degree of perspiration and is thereby a measure for the physical exertion produced by test subject P. On the basis of the thus determined parameters, a further assessment can therefore be made, in combination with the determined accelerations, of the causes of the occurrence of the sexual problem.

10 The dimensions of the actometer are such that test subject P experiences the least possible nuisance therefrom. In a particular preferred embodiment the actometer therefore has dimensions smaller than 5 x 5 x 2 cm (lxwxh).

15 The present invention is not limited to the above described preferred embodiment thereof; the rights sought are rather defined by the following claims, within the scope of which many modifications can be envisaged.

CLAIMS

1. Device for characterizing the sexual disfunction of a person, comprising:

- a holder;
- means for attaching the holder to the person;
- 5 - means arranged in the holder for determining

during use the motion pattern of the person, which motion pattern-determining means comprise:

- at least one acceleration transducer for determining the acceleration values in at least one
- 10 direction of the movements performed by the person as a function of time.

2. Device as claimed in claim 1, comprising a first acceleration transducer for determining the acceleration in a first direction and a second acceleration

15 transducer for determining the acceleration in a second direction substantially transversely of the first direction.

3. Device as claimed in claim 1 or 2, wherein storage means are arranged in the holder for storing the

20 acceleration values determined as a function of time.

4. Device as claimed in claim 3, wherein the storage means comprise a control unit coupled to the acceleration transducers and a number of memories.

5. Device as claimed in any of the foregoing

25 claims, comprising transmission means for sending the stored acceleration values of at least one of the acceleration transducers to an external processing unit.

6. Device as claimed in any of the foregoing claims, wherein the attachment means comprise a belt for

30 arranging around the body of the person.

7. Device as claimed in any of the claims 1-5, wherein the attachment means comprise velcro tape for arranging on an article of clothing of the person and the holder.

8. Device as claimed in any of the claims 1-5, wherein the attachment means comprise a carrier material, preferably a plaster, provided with an adhesive layer.

5 9. Device as claimed in any of the foregoing claims, comprising means for measuring one or more physiological signals generated by the person.

10 10. Device as claimed in claim 9, wherein the measuring means comprise means for measuring the heart rate and/or the electrical resistance of the skin of the person.

11. System for characterizing the sexual disfunction of a person, comprising:

15 - a holder provided with means for attaching the holder to the person, in which holder are arranged means for determining the motion pattern of the person in the situation where it is attached to the person, which motion pattern-determining means comprise at least one acceleration transducer for determining the acceleration value of the movements performed by the person in at least one direction as a function of time;

20 - an external processing unit for processing the determined acceleration values, which is adapted to determine at least the time duration between penetration and ejaculation by the person; wherein the holder and the processing unit are provided with transmission means for sending the acceleration values for processing from the holder to the processing unit.

25 12. System as claimed in claim 11, wherein the processing unit is adapted to determine the number of thrusting movements performed by the person between penetration and ejaculation.

30 13. System as claimed in claim 11 or 12, comprising three acceleration transducers extending substantially transversely of each other for determining the acceleration in three directions substantially transversely of each other, wherein the processing unit

is adapted to determine the speed and/or position of the person as a function of time.

14. Processing unit for application in a system as claimed in any of the claims 11-13.

5 15. Method for characterizing the sexual disfunction of a person, comprising of:

- attaching at least one acceleration transducer to the body of the person;

10 - measuring the acceleration values of the body of the person in at least one direction as a function of time;

- determining the time duration between penetration and ejaculation by the person on the basis of the measured acceleration values.

15 16. Method as claimed in claim 15, comprising of determining the number of thrusting movements performed by the person in said time duration.

20 17. Method as claimed in claim 15 or 16, wherein the device as claimed in any of the claims 1-10 and/or the system as claimed in any of the claims 11-13 is applied.

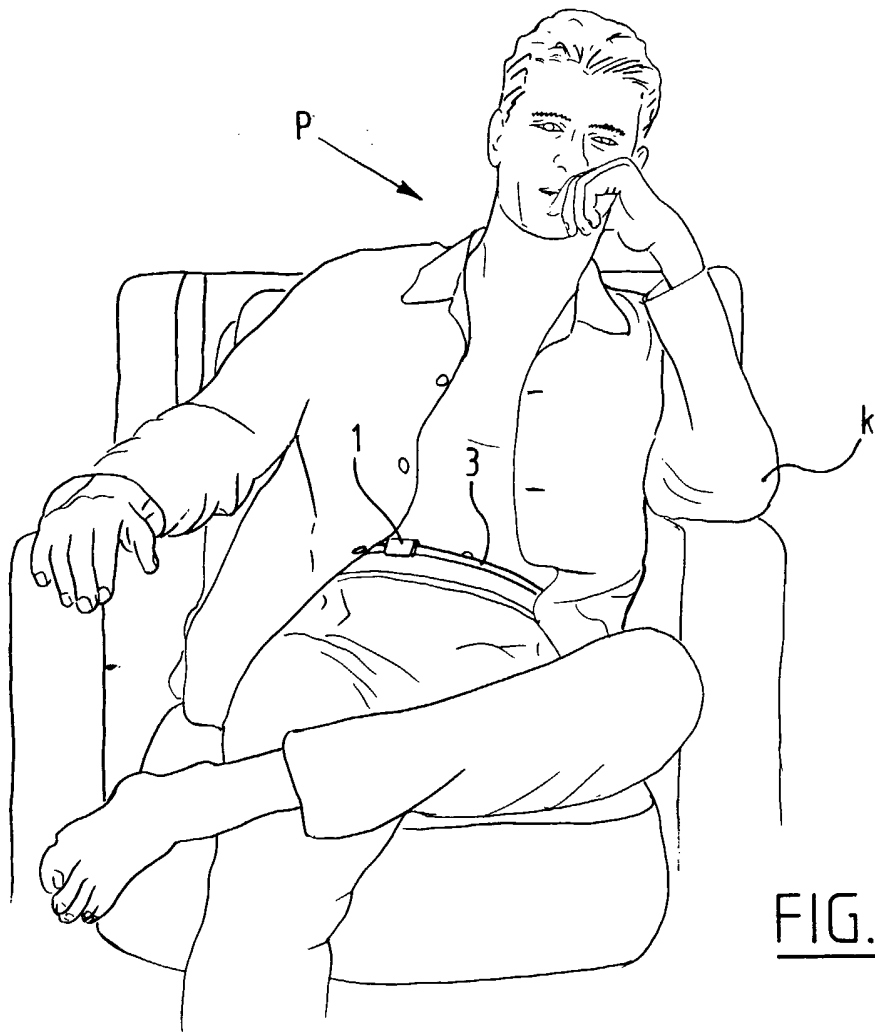


FIG. 1

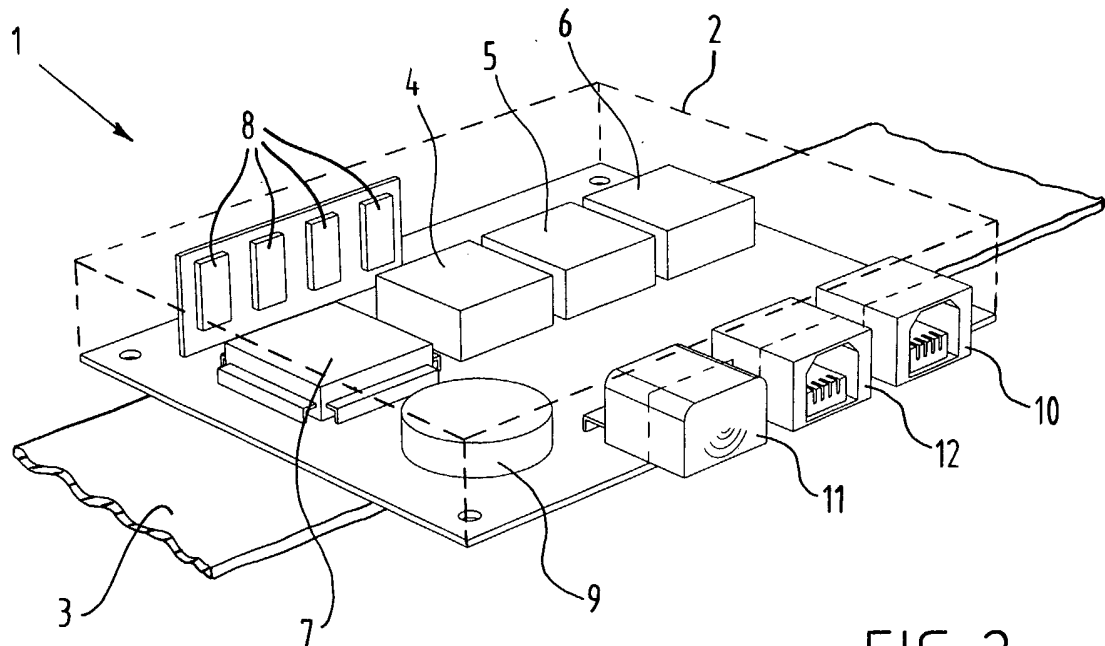


FIG. 2