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(54) **Physical strength age measuring method**

Methode zur Altersbestimmung durch Messung der Körperkraft

Méthode pour déterminer l'âge par mesure de la puissance physique

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(73) Proprietor: **Yugenkaisha Japan Tsusyo**
Kaga-shi, Ishikawa 9220401 (JP)

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(72) Inventor: **KITAGAWA, Katsuyuki c/o HOKKO**
SOHGOH KAIHATSU
Kaga-shi Ishikawa 9220241 (JP)

(74) Representative: **Feray, Valérie et al**
Feray Lenne Conseil
Le Centralis
63, avenue du Général Leclerc
92340 Bourg-la-Reine (FR)

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Description

Field of the Invention

5 **[0001]** The present invention relates to a method to be provided in a recreation facility, for measuring physical fitness, and more particularly relates to a system for measuring a user's age on a basis of physical strength, with the method (1) including various types of exercise courses that may have in them some elements of amusement so as to encourage the user to perform various exercises, and (2) being able to measure how long a user takes to progress through the exercises, so as to calculate the physical-strength age of the user and to assess which athletic activities the user is good or bad at.

Background of the Invention

15 **[0002]** Conventionally, exercise equipment in a recreation facility is intended for young people who are physically fit and who have muscular strength, and thus is not suited for use by elderly people or children. Therefore, a health-factor measuring device that enables all members of a family, including elderly users, to take moderate exercise, and that also provides them with entertainment so that they can enjoy exercising, has been proposed (see Patent Document 1). With this health-factor measuring device, the time that each member of a family takes in completing a certain set of exercises can be measured, and the family members can enjoy comparing the amount of time that each member takes to complete the exercises and seeing who is the fastest in the family. This device, however, does not measure the age of a user on the basis of the user's physical strength.

20 **[0003]** In measuring the age of a student on the basis of the student's physical strength (e.g., an elementary, junior high, or high school student), the student is required to do simple, repetitive exercises, the performance of which is measured as follows: Instantaneous force is measured by the distance that the student jumps by a standing broad jump; grip strength is measured by a grip dynamometer; agility is measured by the number of sideways jumps that the student can do within a specified time; flexibility is measured by how much the student can bend forward when sitting on a floor with his/her legs extended to the front; endurance is measured by the number of sit-ups that the student can do within a specified time; balance is measured by how long the student can stand on one foot with his/her eyes open; and so on. In these measurements to assess age on the basis of physical strength, a user is made to do simple, repetitive exercises. Therefore, when performing such exercises, (1) the user does not have much fun; (2) the user is not made to perform complex muscle actions; (3) the user is not made to use muscles that he/she does not usually use; and (4) although the user's basic physical abilities are measured, the user's complex physical abilities, including memory, attention, and other functions of the brain, are not measured. Accordingly, the user is made to do a long series of a variety of exercises, and the user's physical-strength age is assessed by how long he/she takes to complete the series, and by comparing that time with time data obtained in advance. However, with this method, using a long series of exercises, it is not possible to assess which athletic activities the user is good or bad at. Patent Document 1 discloses devices for bodily feeling one's health wherein a person is allowed to perform various exercise moderately while adding an amusement element. In Patent Document 1, an index of user's exercising ability is calculated based on the amount of time the user takes to complete the devices for bodily feeling user's health. However, that invention does not provide a system for measuring a user's age on a basis of the user's physical strength. Also, it calculates merely an index of physical strength using the amount of time that the user takes to complete the exercise devices, but does not provide an index of an individual exercising ability, for example, an index of body flexibility. Patent Document 3 discloses physical strength age that is determined by the correlation between age and the ratio weight of upper-half body/volume on muscle in lower limbs. However, this measurement is static, which will not obtain the physical strength age based on user's actual exercise. In addition, that invention will not calculate and provide an index of an individual exercising ability, for example an index of the balancing strength in the body, together with the overall physical strength age of the user through various enjoyable exercises.

Patent Document 1: Japanese Published Unexamined Patent Application No. 2001-29503

Patent Document 2: Japanese Published Unexamined Patent Application No. 2004-278150

50 Patent Document 3: Japanese Published Unexamined Patent Application No. 2004-81621

Disclosure of the Invention

Problems to Be Solved by the Invention

55 **[0004]** The present invention has been made to solve the above-mentioned problems. One objective of the present invention is to provide a system for measuring age on the basis of physical strength, with the system (1) having multiple, varying exercise courses that may have in them some elements of amusement, so as to encourage the user to perform

the various exercises comfortably and sufficiently, and (2) being able to measure how long a user takes to complete each exercise course as well as the entire series of courses, so as to calculate the age of the user on the basis of the user's physical strength and to assess how good or bad each of a user's exercise abilities is.

5 Means for Solving the Problems

[0005] The present invention's method for measuring physical-strength age consists of the features of claim 1.

[0006] It is preferable that the specific exercises within each exercise course be arranged so that a user needs to memorize their order and specific features, and to use his/her judgment in selecting the posture or route to be taken in performing each exercise, with the result that intelligence is one of the indexes.

[0007] It is preferable that one exercise course (hereinafter "exercise course 1") have a passageway such that multiple logs having flat upper faces are horizontally or diagonally installed at a predetermined height above the ground (floor), and a structure, arranged in the middle of the passageway, that has a low ceiling that requires a user to change from a standing-upright posture to bending-down posture, a squatting posture, or an on-all-fours posture.

[0008] It is preferable that another exercise course (hereinafter "exercise course 2") be a meandering, upward-sloped passageway having a predetermined width and length, and that multiple projections or holes be provided on said passageway so as to make a user do one or more of the following: climbing up and jumping down; jumping over; crawling up and running down; or climbing while avoiding obstacles.

[0009] It is preferable that another exercise course (hereinafter "exercise course 3") consist of a passageway that for most of its length consists of two separate surfaces to be walked on (hereinafter "walking surfaces"), one for each of a user's legs, with each walking surface having a predetermined width, height, and length, and with the passageway such that in some portions one walking surface is higher than the other; that the passageway has one or more portions where the two walking surfaces are separated from each other (separated-walking-surfaces portion(s)), and one or more portions where the two walking surfaces converge into one (united-walking-surfaces portion(s)); and

[0010] the separated-walking-surfaces portion(s) include one or more sections where the user can or must walk with his/her legs wide apart, as well as one or more sections where the two walking surfaces are of different heights, and one or more sections where the two walking surfaces have the same height.

[0010] It is preferable that another exercise course (hereinafter "exercise course 4") consists of one passageway having a predetermined width, height, and length, with the passageway arranged so that it is winding from beginning to end; and

[0011] it includes a portion where its walking surface goes up and down, a portion where the walking surface is horizontal, a portion where the walking surface is inclined to one side, and a portion where the walking surface is inclined on both sides, with the center of the walking surface being a boundary between the two sides.

[0011] It is preferable that another exercise course (hereinafter referred to as "exercise course 5") consist of a meandering passageway that has a predetermined length and a center wall that divides the passageway; with the center wall

[0012] provided with multiple through-holes into which a user can put his/her arms to support his/her body; and having an approximately vertical portion, an inclined portion, and a portion that is curved on both of its sides.

[0012] It is preferable that another exercise course (hereinafter "exercise course 6") consist of a tunnel-shaped passageway in which inverted-U-shaped pipes are continuously arranged at predetermined intervals, with said pipes being of different heights, so that the passageway has a portion where the user can walk upright, a portion where the user must bend down in order to move forward, and a portion where the user must crouch in order to move forward; and inclined to the right or left so that the passageway has one or more portions where a user must bend his/her body to the right or left in order to move forward.

[0013] It is preferable that the exercise course (hereinafter "exercise course 7") be a passageway of a predetermined length, and that it be arranged such that it meanders up and down and to the right and left, and is equipped with

[0014] two rails, one on the passageway's right side and one on the left side, with the rails arranged so that they sometimes are inclined upward and sometimes inclined downward, and sometimes are directed to the left and sometimes to the right, and

[0015] metal fittings that are mounted to the rails and that slide forward and backward, and an interconnected series of hanging rings that are connected to the metal fittings.

[0014] It is preferable that said exercise courses be accommodated in a long dome made of polystyrene foam.

55 Effects of the Invention

[0015] The present invention's method for measuring age on the basis of physical strength includes

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various types of exercise-related devices/features that are structured such that a user can demonstrate a variety of physical abilities, including muscle strength at multiple places of his/her body, flexibility of the body, balance of the body, and agility of the body;

a method by which an index of the amount of exercise that a user performs is measured by the extent to which each of a user's physical abilities is demonstrated;

exercise courses that each combine a unique set of exercises such that an index value for one exercise course is different from that for another exercise course; and

various types of exercise exercise-related devices/features that differ from each other are installed for the purpose of creating different exercise courses.

As a result, a user's various exercise abilities can be assessed as good or bad according to calculations based on the amount of time that the user takes to complete each of the exercise courses, and the user's overall age on the basis of the user's physical strength can be calculated from the total amount of time that the user takes to complete all of the exercise courses.

[0016] Because the exercise courses are designed so that intelligence is included as an index and so that the intelligence index is given a larger value than the value for any other index, a user's brain functions, such as memory and judgment, are also be taken into consideration in calculating the user's age on the basis of the user's physical strength.

[0017] In exercise course 1, a user walks on logs, and the user must use his/her sense of balance to keep from falling down off of the logs. In addition, it is necessary for the user to use his/her leg muscles, such as the quadriceps femoris muscles and the gastrocnemial muscles. Flexibility of the body also is required. A user must also use his/her ability to quickly judge which posture is most suitable for a given movement, taking into consideration his/her physical strength. Index values representing agility or strength of arm muscles can be assigned small values, because what are assessed the most in this exercise course 1 are (a) the strength of leg muscles, and (b) flexibility of the body.

[0018] In exercise course 2, a user climbs up a slope on which there are obstacles, and therefore the index value for leg-muscle strength can be made large. The index values for balance, agility, and flexibility also must be given large values. In addition, a user is required to have the ability to judge a situation and decide whether to choose a sideways route where there are no obstacles even though doing that would take a longer time, or to go straight forward, climbing over large obstacles, even though he/she might stumble a few times along the way. If the user remembers the condition of an obstacle that he/she first climbs over - behind which holes are hidden - and stays careful afterwards, he/she will know that holes might also be hidden behind subsequent obstacles, and thus he/she can easily avoid the holes. And because the user also uses arm strength when climbing over the obstacles, the index for arm strength can be given a mid-level value.

[0019] Exercise course 3 has two walking surfaces and requires the user to walk with his/her legs apart, and therefore this facility particularly requires leg-muscle strength, though flexibility, agility, and balancing ability also are required. The user moves forward, placing his/her legs on the surfaces to be walked on in such a way that he/she rotates his/her legs and therefore uses inner-thigh muscles, such as the sartorius muscle and adducent muscles, that he/she does not usually use. In addition, such an exercise is said to be effective for preventing incontinence. Because it is hard for a person to remain standing for a long time with his/her legs apart, he/she needs to keep stepping forward quickly. Therefore, the index value for agility can be made large.

[0020] Exercise course 4 makes the user walk in a narrow passageway having a predetermined width, height, and length. Because the facility is formed such that the condition of the walking surface varies from place to place, the index value for bodily balance, among other values such as leg-muscle strength and flexibility, can be made large.

[0021] Exercise course 5 makes the user walk on a narrow passageway along a wall, and requires him/her to use his/her arms to support his/her body so as to keep from falling off the passageway, especially where said wall is inclined or curved toward the user. Accordingly, the index value for arm-muscle strength can be made large. The index values for flexibility and bodily balance also can be made large.

[0022] Exercise course 6 makes the user pass through an inverted-U-shaped pipe tunnel, some portions of which incline to the left or right. As a result, the index value for flexibility can be made large.

[0023] Exercise course 7 is a passageway constituted such that a user moves forward by using his/her hands to grip interconnected series of hanging rings. Where a rail is far from the user, this course is also suitable for a stretching exercise that requires a user to stretch his/her arms. As a result, the index values for flexibility and arm-muscle strength can be made high.

[0024] Because there are no columns in the long dome, there is nothing that might limit the shape or other features of each individual exercise course that is to be accommodated therein. And because the long dome can be extended, it can even accommodate a long exercise course. Furthermore, because the dome is not affected by weather conditions, the utilization rate of the exercise courses is not limited by weather conditions and hence can be high.

Brief Descriptions of the Drawings

[0025]

- 5 Figure 1 is a diagram showing the arrangement of the exercise courses according to one embodiment of the present invention's system for measuring age on the basis of physical strength.
 Figure 2 is a flow chart showing the procedure for using the present invention's system for measuring age on the basis of physical strength.
 Figure 3 is a side view of the Log Range exercise course of the present invention's system for measuring age on the basis of physical strength.
 10 Figure 4 is a cross sectional view of the Log Range exercise course of the present invention's system for measuring age on the basis of physical strength.
 Figure 5 is a longitudinal sectional view of the Climb of Grief exercise course of the present invention's system for measuring age on the basis of physical strength.
 15 Figure 6 is a perspective view of the Climb of Grief exercise course of the present invention's system for measuring age on the basis of physical strength.
 Figure 7 is a perspective view of the Divided Pathway exercise course of the present invention's system for measuring age on the basis of physical strength.
 Figure 8 is a cross sectional view showing variations in the walking surface(s) in the Divided Pathway exercise course of the present invention's system for measuring age on the basis of physical strength, with (a) showing a single walking surface, (b) and (c) showing two differently spaced walking surfaces, and (d), (e), and (f) showing three differently arranged pairs of walking surfaces that vary in terms of both the distance between the walking surfaces and the height of the two surfaces.
 20 Figure 9 is a perspective view of the Road of Torsion exercise course of the present invention's system for measuring age on the basis of physical strength.
 Figure 10 is a cross sectional view of a connecting passageway 60 of the Road of Torsion exercise course of the present invention's system for measuring physical-strength age, with (a) to (d) showing variations in the walking surface.
 Figure 11 is a perspective view of the Wall of Stagnation exercise course of the present invention's system for measuring age on the basis of physical strength.
 30 Figure 12 is a cross sectional view of the Wall of Stagnation exercise course of the present invention's system for measuring age on the basis of physical strength, with (a) to (c) showing variations in the course's central wall.
 Figure 13 is a perspective view of the Cave of Bones exercise course of the present invention's system for measuring age on the basis of physical strength.
 35 Figure 14 is a cross sectional view of the tunnel-shaped passageway of the Cave of Bones exercise course of the present invention's system for measuring age on the basis of physical strength, with (a) to (d) showing variations in the sizes and shapes of the course's pipes.
 Figure 15 is a perspective view of the Stretch with Hanging Rings exercise course of the present invention's system for measuring age on the basis of physical strength.
 40 Figure 16 shows variations in the positioning of the arms of a user 15 according to variations in the rails of the Stretch with Hanging Rings exercise course of the present invention's system for measuring age on the basis of physical strength.
 Figure 17 is a plane view showing the arrangement of the exercise courses of the present invention when they are accommodated in a long dome.
 45 Figure 18 is a longitudinal sectional view showing the arrangement of exercise facilities when the exercising courses of the present invention are accommodated in a long dome.

Explanation of Numbers Used in the Drawings

[0026]

- 50
 1 Log Range exercise course of the system for measuring age on the basis of physical strength
 2 Climb of Grief exercise course of the system for measuring age on the basis of physical strength
 3 Divided Pathway exercise course of the system for measuring age on the basis of physical strength
 55 4 Road of Torsion exercise course of the system for measuring age on the basis of physical strength
 5 Wall of Stagnation exercise course of the system for measuring age on the basis of physical strength
 6 Cave of Bones exercise course of the system for measuring age on the basis of physical strength
 7 Stretch with Hanging Rings exercise course of the system for measuring age on the basis of physical strength

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8	Pipeline exercise course of the system for measuring age on the basis of physical strength
9	Air Forest exercise course of the system for measuring age on the basis of physical strength
10	Corridor of Mirrors exercise course of the system for measuring age on the basis of physical strength
11	Road of Reaching Out exercise course of the system for measuring age on the basis of physical strength
5 12	Suspension Bridge of Courage exercise course named of the system for measuring age on the basis of physical strength
15	user
20	diagram showing the arrangement of the exercise courses of the system for measuring age on the basis of physical strength
10 30	passageway
31	log
32	supporting pillar
40	upward-sloping pathway
41-43	obstacles
15 44	hole
50	pathway
51, 52	split walking surfaces
60	one-track pathway
70	pathway
20 71	central wall
72	through-hole
80	tunnel-shaped pathway
81	pipe
90	pathway
25 91, 92	rails
93, 94	metal fittings
95, 96	interconnected series of hanging rings
97	staircase
100	long dome
30 110	starting point
120	ending point
130	arch
S20-S27	procedure for using the system for measuring age on the basis of physical strength

35 Best Modes for Carrying Out the Invention

[0027] The present invention's method for measuring age on the basis of physical strength will now be explained in detail with reference to the drawings.

40 **[0028]** Figure 1 shows the arrangement of the exercise courses according to one embodiment of the present invention's system for measuring age on the basis of physical strength. This system for measuring age on the basis of physical strength is set up as an outdoor facility. However, all of the exercise courses can be accommodated in a facility having a roof or in an indoor facility. As shown in diagram 20, which illustrates the arrangement of the system's courses, this embodiment of the physical-strength-age measuring system is comprised of 12 courses (each of which is represented by a circled number). Each course is designed such that a user can demonstrate a variety of physical abilities; a user
45 proceeds through a series of courses while performing exercise-like movements, and the completion time thereof is calculated. The number of courses is not limited to 12, and the design of the courses can vary depending on what type and how many physical abilities are to be measured.

[0029] Each course has a unique name. Course 1 is named Stretch with Hanging Rings 7, which requires a user to walk while stretching his/her arms holding in each hand an interconnected series of hanging rings. Course 2 is named
50 Pipeline 8, which requires a user to pass through a jungle of pipes. Course 3 is named Air Forest 9, which requires a user to push through large rubber balls in order to move forward. Course 4 is named Log Range 1, which requires a user to walk on logs while keeping his/her balance. Course 5 is named Climb of Grief 2, which requires a user to climb up a slope that has many obstacles. Course 6 is named Road of Torsion 4, which requires a user to walk along a narrow pathway. Course 7 is named Corridor of Mirrors 10, which requires a user to climb up a labyrinth-like arrangement of
55 stairs. Course 8 is named Road of Reaching Out, which requires a user to walk along a pathway of pipes, while holding on to handrails. Course 9 is named Suspension Bridge of Courage 12, which requires a user to walk across a suspension bridge. Course 10 is named Divided Pathway 3, which requires a user to walk with his/her legs apart. Course 11 is named Wall of Stagnation 5, which requires a user to walk sideways, holding on to a wall. Course 12 is named Cave of

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Bones 6, which requires a user to move through a tunnel with his/her body in a contracted position.

[0030] In this embodiment, exercise course 1 is Log Range 1, exercise course 2 is Climb of Grief 2, exercise course 3 is Divided Pathway 3, exercise course 4 is Road of Torsion 4, exercise course 5 is Wall of Stagnation 5, exercise course 6 is Cave of Bones 6, and exercise course 7 is Stretch with Hanging Rings 7. These courses are mainly explained here. How long it takes for a user to complete one course varies from several tens of seconds to several minutes. However, the exercise facilities are designed such that a user can complete each course in about one minute. Therefore, in a case where there are 12 courses in total, a user can finish the entire series of courses in about 12 minutes, and even if the time for a user to go from one course to another is taken into consideration, the user can finish the entire series of courses in about 30 minutes. Exercising in such courses enables the stamina of a user to be measured. Also, each course is designed such that it requires a user to demonstrate the instantaneous force of his/her muscles, which is as important as stamina.

[0031] Figure 2 is a flow chart showing the procedure for using the system for measuring age on the basis of physical strength. As shown in Figure 2, a user first submits at a service counter (S20) an application to use the system for measuring age on the basis of physical strength. Next, the user measures his/her blood pressure and pulse rate. Then, the user bends down forward on a pedestal or under a condition of staying long on a floor, to determine - and then record on a scorecard (memo pad) - the distance by which the tips of his/her fingers go below or over his/her toes (S21). Then the user's physical condition is checked (S22). For example, a user whose blood pressure is high or whose physical condition is not good (S23) is instructed to refrain from exercising in this course. (S24).

[0032] Each user is then given a stopwatch and a pulse meter. The user then proceeds through each course, and records on the above-mentioned scorecard how much time is necessary for the user to complete each course; the user also records his/her pulse rates when starting and finishing each course. The pulse meter also serves to help ensure that the user refrains from exercising excessively. When the user reaches the end of the series of courses, he/she again measures his/her blood pressure, pulse rate, and bending-forward distance, and records those numbers on the scorecard. Here, the user can realize that completing the 30-minute series of exercise courses has improved his/her ability to bend forward. Also, by considering the beginning and ending pulse rates, the user can tell whether he/she has been exercising enough. After the user writes down his/her actual age on the scorecard and submits the scorecard at the service counter, the scorecard is analyzed and the user's age on the basis of the user's physical strength is calculated and then printed on a certificate that is given to the user. The user is also informed as to which of his/her physical abilities are good or bad.

[0033] The system for calculating a user's age on the basis of the user's physical strength can be created using a personal computer (PC), for example. Also, data regarding past users are stored in the personal computer, and the statistical relationship between the time required for a user to complete all the courses and his/her actual age is updated each time that the user completes the series of courses. After the user's completion time for each course is entered, the age on the basis of the physical strength is calculated with reference to this statistical data.

[0034] Physical-strength age is calculated taking into consideration the time that a user takes in completing the entire series of courses. The age on the basis of the physical strength data is stored. An example of Wall of Stagnation 5 (exercise course 5) data in Course 11 is shown in Table 1, and an example of Cave of Bones 6 (exercise course 6) data in Course 12 is shown in Table 2. Age is classified according to 10-year groupings, but the classification period can be smaller. The style of these tables can be used for a table that shows the age of a user on the basis of the physical strength as calculated by taking into consideration the time needed to complete the entire series of courses.

[0035]

[Table 1]

	Completion Time	Physical-Strength Age
1	32 seconds	Teens
2	36 seconds	20s
3	41 seconds	30s
4	53 seconds	40s
5	62 seconds	50s
6	70 seconds	60s
7	75 seconds	70s
8	82 seconds	80s

[0036]

[Table 2]

	Completion Time	Physical-Strength Age
1	15 seconds	Teens
2	16 seconds	20s
3	21 seconds	30s
4	28 seconds	40s
5	32 seconds	50s
6	36 seconds	60s
7	40 seconds	70s
8	45 seconds	80s

[0037] In this embodiment, the following five physical abilities are evaluated: leg strength, arm strength, flexibility of the body, balance of the body, and agility of the body. Also, six indexes - indexes for the above-mentioned physical abilities, as well as an index for intelligence - are used. This embodiment evaluates, from among the muscles at various parts of the body, the strength of arm and leg muscles. However, this embodiment is not limited to evaluating the strength of legs and arms, and the strength of muscles in the hands, abdomen, and so on also can be evaluated. Moreover, a particular muscle at a specific portion of the legs can be focused on. With regard to leg strength, the focus can be either on a muscle that excels at endurance or on a muscle that excels at short periods of exertion of muscle force. The extent to which a muscle to be evaluated exerts strength is indexed as the amount of exercise, and the exercise courses are designed in such a way that one exercise course requires a different amount of exercise than that required by another exercise course. If the body is considered in more detail so as to decide which specific muscle(s) should be evaluated for muscle strength, an increased number of exercise courses will be necessary to evaluate the strength of each designated muscle, resulting in a more complicated overall exercise facility.

[0038] Usually, muscles are strengthened by using them. When muscles are exercised, they become thick and hard, but they lose flexibility. For this reason, when evaluating muscle strength, such ambivalent characteristics of muscles - with regard to the relation between their thickness/hardness and flexibility - are also taken into consideration. In addition, mental factors - such as memory, attention, and judgment, which are said to deteriorate as one ages - are added as an index. For example, by making a user judge which route is the shortest, or by presenting a device in which a door opens after a certain multi-digit number is memorized and entered by the user, the user's physical abilities, including his/her brain functions can be evaluated. If the amount of brain activity is counted as an amount of exercise, judgment is regarded as an exercising capability. If one's judgment is excellent, it manifests as quickness (i.e., short time taken in judging), and if judgment is poor, it manifests as slowness (i.e., long time taken in judging).

[0039] In this embodiment, for each type of exercise course, the following are indexed as measurements of exercise: physical abilities (i.e., leg strength, arm strength, flexibility of the body, balance of the body, and agility of the body), and the extent to which intelligence is demonstrated. The exercise courses are designed so that these indexes differ among the exercise courses. The amount of exercise corresponds to a workload, such as - in the case of the legs, for example - the amount of exercise in moving the legs up and down 10 times. If this amount of exercise is expressed as an index value of 10, an index value of 5 for the legs indicates one-half of the amount of exercise of an index value of 10. When this amount of exercise is divided by the muscle strength of the leg, the time taken to perform that amount of exercise can be determined. This can be expressed in the formula $W/F = t$ (where W is the amount of exercise, F is the strength of a muscle, and t is the time taken to perform that amount of exercise). If $1/F$ is expressed as x , the above formula can be expressed as $W \cdot x = t$.

[0040] If in an exercise course a user is made to perform the exercise amount W , and if the completion time t is measured, an inverse number x of the muscle strength can be calculated. Here, if the exercise course requires that a user do only one simple exercise, the simple exercise may not have in it any amusing or interesting elements. Therefore, if an exercise course is designed to make a user do three different exercises (e.g., exercises of the legs, hands, and abdomen), the number of muscle types to be evaluated increases, and thus the number of invert numbers of muscle strengths, namely variables to be determined, increases to three (i.e., x_1 , x_2 , and x_3). In this case, a completion time t_1 for this exercise course can be expressed as $W_1 \cdot x_1 + W_2 \cdot x_2 + W_3 \cdot x_3 = t_1$. If only one exercise course is completed, x_1 , x_2 , and x_3 cannot be determined. Thus, when three variables are to be determined, three exercise courses, for example, can be provided. Then the exercise courses are designed so that an exercise amount W of one exercise course is different from the exercise amount W of another exercise course. If the completion times t_1 , t_2 , t_3 for the three exercise

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courses are measured, the following three formulas are obtained: $W11 \cdot x1 + W12 \cdot x2 + W13 \cdot x3 = t1$; $W21 \cdot x1 + W22 \cdot x2 + W23 \cdot x3 = t2$; and $W31 \cdot x1 + W32 \cdot x2 + W33 \cdot x3 = t3$. These are simultaneous linear equations, and therefore it is possible to determine $x1$, $x2$, and $x3$.

[0041] Table 3 shows the amounts of exercise (shown as indexes) to be performed in exercise courses 1 to 7 - namely Log Range 1, Climb of Grief 2, Divided Pathway 3, Road of Torsion 4, Wall of Stagnation 5, Cave of Bones 6, and Stretch with Hanging Rings 7. As shown in the table, the combination of indexes (for leg strength, arm strength, flexibility, balance, agility, and intelligence) is designed to differ among the various exercise courses. The various types of exercise and various course conditions are designed so that each physical ability can be evaluated by measuring the completion time for each exercise course. Also, Stretch with Hanging Rings is first of the courses, and it serves also as a warm-up course for loosening up the muscles of the body. In the case of the 12 courses, each of which involves the use of different exercise devices/features or different exercise conditions, the number of physical abilities that can be distinguished from each other is, in theory, 12.

[0042]

[Table 3]

Course	Legs	Arms	Flexibility	Balance	Agility	Intelligence
Log Range	6	4	9	10	4	6
Climb of Grief	7	6	6	6	8	6
Divided Pathway	7	2	9	9	9	2
Road of Torsion	7	3	6	10	5	3
Wall of Stagnation	4	8	7	7	4	4
Cave of Bones	4	5	10	7	4	4
Stretch with Hanging Rings	4	6	10	3	5	2

[0043] Among the 12 courses of the system for measuring age on the basis of physical strength, the exercise courses shown in Table 3 will now be described in more detail. Figure 3 is a side view of the Log Range 1 exercise course. As shown by Figure 3, this exercise course is a passageway 30, in which multiple logs 31 with flattened tops are horizontally or diagonally provided on supporting pillars at predetermined heights from the ground 32. In the middle of the passageway 30, a user-height-limiting board 33 is hung from the ceiling. Therefore, in order to move forward, a user must change his/her posture from a standing posture to a bent-down posture with his/her waist bent, a crouching posture with his/her legs bent, or an on-all-fours posture. If the user does not promptly judge which posture to take, the time needed to complete the course becomes longer. Figure 4 is a cross sectional view of Log Range 1. Because the top surface of the log 31 is narrow, the user 15 needs to keep his/her balance while walking forward. If the user loses balance and falls from the log 31, the time needed to complete the course becomes accordingly longer.

[0044] Figure 5 is a longitudinal sectional view of the Climb of Grief 2 exercise course. As shown in Figure 5, this exercise course is a meandering, rising passageway 40 that is provided on a slope of a predetermined width and length. Obstacles 41 to 43 of various shapes and a hole 44 are provided on the climbing passageway 40. The user climbs up the obstacle 41 and jumps off from it. The user then crawls up the obstacle 42 and jumps down from it. The user then jumps over the hole 44 and the obstacle 43. Or, the user can climb up the passageway 40 and go around the obstacles and/or the hole, although by doing that the time needed to complete the course might become longer. Figure 6 is a perspective view of Climb of Grief 2. The obstacles 41 to 43 are arranged along the passageway. If a user is not confident that he/she can climb up straight, he/she may advance up the passageway by detouring to the right or the left.

[0045] Figure 7 is a perspective view of the Divided Pathway 3 exercise facility. This exercise course consists of a

passageway 50 that for most of its length is separated into two walking surfaces 51, 52, to be walked on, one for each foot of a user. Each of the two walking surfaces 51, 52 has a predetermined width, height, and length, and can have a high middle part, being inclined on both sides. The passageway 50 has a portion where it is divided into the two walking surfaces 51, 52, and also has a portion where the two walking surfaces 51, 52 converge into one again. Where the passageway is divided, the user walks with his/her legs apart. Figure 8 is a cross sectional view showing the height of the two walking surfaces in Divided Pathway 3; (a) shows a portion where the two walking surfaces converge into one; (b) shows a portion where the passageway is divided into two walking surfaces; and (c) shows a portion where the distance between the two walking surfaces is large. The tops of the walking surfaces can have a high middle part and be inclined on both sides. This will make it difficult for a user to walk hurriedly on only one walking surface 51 or 52 instead of walking on both walking surfaces 51, 52 with his/her legs apart; (d), (e), and (f) show variations in the heights of, and distances between, the two walking surfaces. Such shapes of the walking surfaces result in an exercise that requires that a user frequently move the gravity center of his/her body from one side to the other.

[0046] Figure 9 is a perspective view of Road of Torsion 4. This exercise course consists of one meandering passageway 60 of a predetermined width, height, and length, with the height of the passageway 60 varying along the way. Figure 10 is a cross sectional view of the passageway 60 of Road of Torsion 4. The passageway 60 has a portion (a) where the walking surface is horizontal, a portion (b) where the walking surface inclines to one side, a portion (c) where the walking surface inclines to the other side, and a portion (d) where the walking surface inclines on both sides, separated by the centerline of the pathway.

[0047] Figure 11 is a perspective view of Wall of Stagnation 5. This exercise course consists of a meandering passageway 70 that has a predetermined length, and a center wall 71 that divides the passageway 70 into two pathways. A large number of through-holes 72, into which a user can insert his/her hands to support his/her body, are provided in the central wall 71. Figure 12 is a cross sectional view of Wall of Stagnation 5. The center wall 71 has an approximately perpendicular portion, as shown in (a); a curved portion, as shown in (b); and a portion that is inclined, as shown in (c). Therefore, a user needs to move forward inserting his/her hands into the through-holes 72 to support his/her body so as to not fall off the pathway; this requires arm-muscle strength. In addition, the pathway can be inclined.

[0048] Figure 13 is a perspective view of Cave of Bones 6. This exercise course consists of a tunnel-shaped passageway 80, in which inverted-U-shaped pipes 81 of different heights are continuously arranged at predetermined intervals. Figure 14 consists of four cross sectional views of the tunnel-shaped passageway 80. The passageway has a portion (a) where the user can walk while standing erect; portions (b) and (c) where the user must lean to the right or left in order to move forward, because the pipes 81 are inclined; a portion (d) where the user must sit down on his/her heels or crouch in order to move forward; and a portion (not shown) where the user must walk with a stoop in order to move forward.

[0049] Figure 15 is a perspective view of Stretch with Hanging Rings 7. This exercise course consists of: (1) a passageway 90 that has a predetermined length; (2) two rails 91, 92 that meander up and down and to the right and left; (3) multiple metal fittings 93, 94 that are mounted to the rails and slide forward and backward, and (4) two interconnected series of hanging-rings 95, 96 that are connected with the metal fittings 93, 94, respectively, and that as a group expand and contract in an accordion-like fashion. Figure 16 shows variations in the positions of the arms of a user 15 depending on the positions of the rails 91, 92. In (a) and (b), one or the other of the user's arms is raised upward; in (c), both arms are extended downward to be slanted off the horizontal; and in (d), both arms are raised to be slanted off the horizontal; the rings can be arranged so that a user's arms are positioned in other ways.

[0050] Figure 17 is a plane view showing the exercise courses accommodated in a long dome. Figure 18 is a longitudinal sectional view of the inside of the long dome 100 in which the exercise courses are accommodated. As shown in Figures 17 and 18, the long dome 100 consists of front and rear portions which are divided into halves of a hemisphere dome respectively and an intermediate portion consisting of multiple arches 130 between the front portion and the rear portion, and has an entrance 110 and an exit 120 at its front and rear portions, respectively. The length of the long dome 100 can be extended by adding more arches 130 thereto. Also, if there are a large number of exercise courses, some long domes 100 can be combined together to accommodate the exercise courses.

[0051] It is preferable that such a long dome 100 be made of polystyrene foam. Thus, this long dome has the merit of being easy to construct, its service life will be long, and it is inexpensive to construct. Also, many skylights and bay windows can be arranged in the long dome, so that the inside of the long dome will be well-lit, bright, and give users a feeling of freedom. As one example, the following are arranged inside the long dome 100: Staircases 97, having different gradients; Pipeline 8 where a large number of gate-type, squarely bent pipes are crowded together; Road of Reaching Out 11, where the users stretch their arms to grab bars arranged on the ceiling and walk sideways in a narrow passageway; Cave of Bones 6, where the users move forward passing through curved, pipe-like tunnels; and Climb of Grief 2, where the users climb up a slope having many obstacles.

Industrial Applicability

[0052] The present invention's method for measuring a user's age on the basis of the user's physical strength can be carried out at a recreational facility or the like on a system which consists of various types of exercise courses that may have in them some elements of amusement.

Claims

1. A method for calculating a user's age on a basis of the user's physical strength provided with a plurality of exercise courses, various type of exercise-related devices/features being structured such that:

- respective exercise-related devices/features configured so as to allow users to utilize any of physical abilities of leg strength, arm strength, flexibility of the body, balance of the body, and agility of the body are provided at each of the courses,
- the extent to which the physical abilities are utilized is expressed by values of indexes,
- the combination of the values of the indexes in each of the exercise courses is different from that of the values of indexes in each of the other exercise courses; and
- a computer means retaining said values of indexes being predetermined is provided, comprising the step of:

storing data regarding relationship between respective amounts of time that past users of the exercise-related devices/features took to complete all of the exercise courses and the users' respective actual ages, the data being converted into a statistical data that expresses the relationship between the amount of time that a user takes to complete all of the exercise courses and the user's physical strength age, so as to calculate user's physical strength age based on the amount of time that the user takes to complete all of the exercise courses by referring to the statistical data,

defining that the amount of time that a user takes to complete each of the exercise courses is obtained (i) by multiplying each value of index of the respective physical abilities set for each of the courses as a coefficient and a variable representing each of the physical abilities to be obtained, and (ii) by adding the respective numerical values obtained by the aforesaid multiplications, and calculating the user's respective physical abilities based on the respective amount of time that the user takes to complete a plurality of exercise courses by finding each value of said variable.

2. A method according to claim 1, wherein the exercise courses are structured such that the specific exercises within each exercise course are arranged so that a user needs to memorize their order and specific features, and to use his/her judgment in selecting the posture or route to be taken in performing each exercise, with the result that intelligence is one of the values of indexes.

3. A method according to claim 1, wherein any one of the exercise-related devices/features (1) is equipped with,

- a passageway (30) such that multiple logs (31) having flat upper faces are horizontally or diagonally installed at predetermined heights above the floor, and
- a structure (33), arranged in the middle of the passageway (30), that has a low ceiling that requires a user to change from a standing-upright posture to bending-down posture, a squatting posture, or an on-all-fours posture.

4. A method according to claim 1, wherein,

- any one of the exercise-related devices/features (2) is a meandering, upward-sloped passageway (40) having a predetermined width and length, and
- multiple projections (41, 42, 43) or holes (44) are provided on said passageway so as to make a user do one or more of the following: climbing up and jumping down; jumping over; crawling up and running down; or climbing while avoiding obstacles.

5. A method according to claim 1, wherein,

- any one of the exercise-related devices/features (3) consists of a passageway (50) that for most of its length consists of two separate surfaces (51, 52) to be walked on (hereinafter "walking surfaces"), one for each of a user's legs, with each walking surface having a predetermined width, height, and length, and with the passageway

such that in some portions one walking surface is higher than the other;

• the passageway (50) has one or more portions where the two walking surfaces (51, 52) are separated from each other (separated-walking-surfaces portion(s)), and one or more portions where the two walking surfaces converge into one (united-walking-surfaces portion(s)); and,

• the separated-walking-surfaces portion(s) include one or more sections where the user can or must walk with his/her legs wide apart, as well as one or more sections where the two walking surfaces are of different heights, and one or more sections where the two walking surfaces have the same height.

6. A method according to claim 1, wherein any one of the exercise-related devices/features (4) consists of one passageway (60) having a predetermined width, height, and length, and with the passageway (60) arranged so that,

• it is winding from beginning to end; and

• it includes a portion where the walking surface goes up and down, a portion where the walking surface is horizontal, a portion where the walking surface is inclined to one side, and a portion where the walking surface is inclined on both sides, with the center of the walking surface being a boundary between the two sides.

7. A method according to claim 1, wherein,

• any one of the exercise-related devices/features (5) is a meandering passageway (70) having a predetermined length and a center wall (71) that divides the passageway (70) into two pathways, with said central wall (71) provided with multiple through-holes (72) into which a user can insert his arms so as to support his/her body, and

• having an approximately vertical portion, an inclined portion, and a portion that is curved on both side faces.

8. A method according to claim 1, wherein,

• any one of the exercise-related devices/features (6) consists of a tunnel-shaped passageway (80) in which inverted-U-shaped pipes (81) are continuously arranged at predetermined intervals;

• pipes (81) of different height are used so that the passageway (80) has a portion in which the user can walk upright, a portion in which the user must bend down in order to move forward, and a portion in which a user must crouch in order to move forward; and

• the pipes (81) incline to the right or left so that the passageway has one or more portions where a user must bend to the right or left in order to move forward.

9. A method according to Claim 1, wherein any one of the exercise-related devices/features (7) is a passageway (90) of a predetermined length, and is arranged such that meanders up and down and to the right and left, and is equipped with

• two rails (91, 92), one on the passageway's right side and one on the left side, with the rails (91, 92) arranged so that they sometimes are inclined upward and sometimes inclined downward, and sometimes are directed to the left and sometimes to the right

• metal fittings (93, 94) that are mounted to the rails (91, 92) and that slide forward and backward, and an interconnected series of hanging rings (95, 96) that are connected to the metal fittings.

10. A method according to claim 1, wherein all of the exercise-related devices/features are accommodated in a long dome (100) made of polystyrene foam.

Patentansprüche

1. Verfahren zum Berechnen des Alters eines Benutzers auf Basis der körperlichen Stärke des Benutzers, bereitgestellt mit einer Mehrzahl von Übungskursen, wobei diverse Arten von übungsbezogenen Geräten/Merkmalen derart aufgebaut sind, dass:

• jeweilige übungsbezogene Geräte/Merkmale, die konfiguriert sind, um Benutzern die Nutzung einer der körperlichen Fähigkeiten aus Beinstärke, Armstärke, Beweglichkeit des Körpers, Gleichgewicht des Körpers und Wendigkeit des Körpers zu ermöglichen, in jedem der Kurse vorgesehen sind,

• das Ausmaß, in dem die körperlichen Fähigkeiten genutzt werden, in Indexwerten ausgedrückt wird,

• sich die Kombination der Indexwerte in jedem der Übungskurse von der Kombination der Indexwerte in jedem

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der anderen Übungskurse unterscheidet; und

• ein Rechengerät, das diese vorab bestimmten Indexwerte festhält, bereitgestellt wird, umfassend die folgenden Schritte:

- 5
- Speichern der Daten zur Beziehung zwischen jeweiligen Zeiträumen, die bisherige Benutzer der übungsbezogenen Geräte/Merkmale benötigten, um alle Übungskurse abzuschließen, und dem jeweiligen tatsächlichen Alter der Benutzer, wobei die Daten in statistische Daten konvertiert werden, die die Beziehung zwischen dem Zeitraum, den ein Benutzer benötigt, um alle Übungskurse abzuschließen, und dem körperlichen Kraftalters des Benutzer ausdrücken, um das körperliche Kraftalter des Benutzers auf Basis des
- 10
- Zeitraums, der der Benutzer benötigt, um alle Übungskurse abzuschließen, unter Verwendung der statistischen Daten zu berechnen,
 - Definieren, dass der Zeitraum, den ein Benutzer benötigt, um jeden der Übungskurse abzuschließen, erhalten wird durch (i) Multiplizieren jedes Indexwertes der jeweiligen körperlichen Fähigkeiten, der für jeden der Kurse als Koeffizient festgelegt ist, und einer Variable, die jede der zu erhaltenen körperlichen Fähigkeiten repräsentiert, und durch (ii) Addieren der jeweiligen numerischen Werte, die durch die oben
- 15
- genannten Multiplikationen erhalten wurden,
 - Berechnen der jeweiligen körperlichen Fähigkeiten eines Benutzers auf Basis des jeweiligen Zeitraums, den der Benutzer benötigt, um eine Mehrzahl von Übungskursen abzuschließen, durch Ermitteln jedes Werts der Variable.
- 20
2. Verfahren nach Anspruch 1, wobei die Übungskurse derart aufgebaut sind, dass die spezifischen Übungen in jedem Übungskurse angeordnet sind, so dass sich ein Benutzer deren Reihenfolge und spezifischen Merkmale einprägen muss und sein Beurteilungsvermögen bei der Auswahl der einzunehmenden Haltung oder des einzuschlagenden Weges bei der Ausführung jeder Übung einsetzen muss, mit dem Ergebnis, dass die Intelligenz einen der Indexwerte
- 25
3. Verfahren nach Anspruch 1, wobei eines der übungsbezogenen Geräte/Merkmale (1) ausgestattet ist mit:
- einem Durchgang (30), so dass mehrere Blöcke (31) mit flachen Oberflächen horizontal oder diagonal in vorab definierten Höhen über dem Boden installiert sind, und
 - einer Struktur (33), die in der Mitte des Durchgangs (30) positioniert ist, die niedrig ist, so dass ein Benutzer seine aufrechtstehende Haltung in eine nach unten gebogene Haltung, eine hockende Haltung oder eine Aufallen-Vieren-Haltung ändern muss.
- 30
4. Verfahren nach Anspruch 1, wobei
- eines der übungsbezogenen Geräte/Merkmale (2) ein mäandrischer aufwärts geneigter Durchgang (40) mit einer vorab definierten Breite und Länge ist, und
 - mehrere Vorsprünge (41, 42, 43) oder Löcher (44) am Durchgang vorgesehen sind, so dass ein Benutzer zumindest eines des Folgenden ausführen muss: Hochklettern und Hinunterspringen; Darüberspringen; Hochkrabbeln und Hinunterlaufen; oder Klettern bei gleichzeitigem Umgehen von Hindernissen.
- 35
5. Verfahren nach Anspruch 1, wobei
- eines der übungsbezogenen Geräte/Merkmale (3) aus einem Durchgang (50) besteht, dessen Länge großteils aus zwei getrennten Oberflächen (51, 52) besteht, auf denen zu gehen ist (im Folgenden "Gehflächen" genannt), eine für jedes Bein eines Benutzers, wobei jede Gehfläche eine vorab definierte Breite, Höhe und Länge aufweist, und wobei beim Durchgang eine Gehfläche in einigen Abschnitten höher als die andere ist;
 - der Durchgang (50) einen oder mehrere Abschnitte, in denen die beiden Gehflächen (51, 52) voneinander getrennt vorliegen (Abschnitt(e) mit getrennten Gehflächen)) und einen oder mehrere Abschnitte aufweist, in denen die beiden Gehflächen in eine zusammenlaufen (Abschnitt(e) mit vereinten Gehflächen)); und
 - der Abschnitt bzw. die Abschnitte mit getrennten Gehflächen einen oder mehrere Bereiche, auf denen der Benutzer mit seinen Beinen weit gespreizt gehen kann oder muss, sowie einen oder mehrere Bereiche, in denen die beiden Gehflächen unterschiedliche Höhen haben, und einen oder mehrere Bereiche, in denen die
- 45
- beiden Gehflächen die gleiche Höhe haben, aufweist bzw. aufweisen.
- 50
6. Verfahren nach Anspruch 1, wobei eines der übungsbezogenen Geräte/Merkmale (4) aus einem Durchgang (60) besteht, der eine vorab definierte Breite, Höhe und Länge aufweist, und wobei der Durchgang (60) derart angeordnet
- 55

ist, dass

- er vom Beginn bis zum Ende kurvenreich ist; und
- er einen Abschnitt, in dem die Gehfläche nach oben und unten verläuft, einen Abschnitt, in dem die Gehfläche horizontal verläuft, einen Abschnitt, in dem die Gehfläche auf eine Seite geneigt ist, und einen Abschnitt, in dem die Gehfläche auf beiden Seiten geneigt ist, aufweist, wobei das Zentrum der Gehfläche eine Grenze zwischen den beiden Seiten ist.

7. Verfahren nach Anspruch 1, wobei

- eines der übungsbezogenen Geräte/Merkmale (5) ein mäandrischer Durchgang (70) mit einer vorab definierten Länge und einer Mittelwand (71) ist, die den Durchgang (70) in zwei Durchgänge teilt, wobei die Mittelwand (71) mit mehreren Durchgangsöffnungen (72) versehen ist, in die ein Benutzer seine Arme stecken kann, um seinen Körper abzustützen, und
- mit einem ungefähr vertikalen Abschnitt, einem geneigten Abschnitt und einem Abschnitt, der an beiden Seitenflächen gebogen ist.

8. Verfahren nach Anspruch 1, wobei

- eines der übungsbezogenen Geräte/Merkmale (6) aus einem tunnelförmigen Durchgang (80) besteht, in dem invertierte U-förmige Rohre (81) in vorab definierten Abständen kontinuierlich angeordnet sind;
- Rohre (81) unterschiedlicher Höhe verwendet werden, so dass der Durchgang (80) einen Abschnitt, in dem der Benutzer aufrecht gehen kann, einen Abschnitt, in dem sich der Benutzer nach unten krümmen muss, um vorwärts zu kommen, und einen Abschnitt, in dem ein Benutzer kriechen muss, um vorwärts zu kommen, aufweist; und
- sich die Rohre (81) nach links oder rechts neigen, so dass der Durchgang einen oder mehrere Abschnitt aufweist, in denen sich ein Benutzer nach rechts oder links biegen muss, um vorwärts zu kommen.

9. Verfahren nach Anspruch 1, wobei eines der übungsbezogenen Geräte/Merkmale (7) ein Durchgang (90) vorab definierter Länge und angeordnet ist, um mäanderartig nach oben und nach unten sowie nach rechts und nach links zu verlaufen, und ausgestattet ist mit

- zwei Schienen (91, 92), eine auf der rechten Seite des Durchgangs und eine auf dessen linken Seite, wobei die Schienen (91, 92) angeordnet sind, um sich manchmal nach oben und manchmal nach unten zu neigen, und manchmal nach links und manchmal nach rechts ausgerichtet sind,
- Metallbeschlägen (93, 94), die auf den Schienen (91, 92) befestigt sind und vorwärts und rückwärts gleiten, und
- einer miteinander verbundenen Reihe von Hängeringen (95, 96), die mit den Metallbeschlägen verbunden sind.

10. Verfahren nach Anspruch 1, wobei alle übungsbezogenen Geräte/Merkmale in einer langen Kuppel (100) aus Polystyrolschaum vorgesehen sind.

Revendications

1. Procédé pour calculer l'âge d'un utilisateur en fonction de la résistance physique de l'utilisateur, réalisé à l'aide d'une pluralité de parcours d'exercices, les différents types de dispositifs/éléments caractéristiques liés à l'exercice étant structurés de sorte que :

l'on prévoit des dispositifs/éléments caractéristiques liés à l'exercice respectifs configurés pour permettre aux utilisateurs d'utiliser l'une quelconque des capacités physiques parmi la résistance de jambe, la résistance de bras, la souplesse du corps, l'équilibre du corps et l'agilité du corps à chacun des parcours, l'étendue sur laquelle les capacités physiques sont utilisées, est exprimée par valeurs d'index, la combinaison des valeurs d'index dans chacun des parcours d'exercices est différente de celle des valeurs d'index dans chacun des autres parcours d'exercices ; et l'on prévoit des moyens informatiques retenant lesdites valeurs d'index prédéterminées, comprenant les étapes consistant à :

mémoriser des données concernant la relation entre les quantités respectives de temps que les anciens

utilisateurs des dispositifs/éléments caractéristiques liés à l'exercice mettaient pour terminer tous les parcours d'exercices et les âges réels respectifs des utilisateurs, les données étant converties en données statistiques qui expriment la relation entre la quantité de temps qu'un utilisateur met pour terminer la totalité des parcours d'exercices et l'âge de résistance physique de l'utilisateur, afin de calculer l'âge de résistance physique de l'utilisateur en fonction de la quantité de temps que l'utilisateur met pour terminer la totalité

des parcours d'exercices en se référant aux données statistiques, définir que la quantité de temps qu'un utilisateur met pour terminer chacun des parcours d'exercices est obtenue (i) en multipliant chaque valeur d'index des capacités physiques respectives établie pour chacun des parcours en tant que coefficient et une variable représentant chacune des capacités physiques à obtenir, et (ii) en additionnant les valeurs numériques respectives obtenues par les multiplications mentionnées ci-dessus, et calculer les capacités physiques respectives de l'utilisateur en fonction de la quantité de temps respective que l'utilisateur met à terminer une pluralité de parcours d'exercices en trouvant chaque valeur de ladite variable.

2. Procédé selon la revendication 1, dans lequel les parcours d'exercices sont structurés de sorte que les exercices spécifiques dans chaque parcours d'exercices sont agencés de sorte qu'un utilisateur doit mémoriser leur ordre et leurs éléments caractéristiques spécifiques, et utiliser son jugement pour sélectionner la posture ou la façon de réaliser chaque exercice, avec le résultat que l'intelligence est l'une des valeurs d'index.

3. Procédé selon la revendication 1, dans lequel l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (1) est équipé avec :

une voie de passage (30) de sorte que plusieurs rondins (31) ayant des faces supérieures plates sont installés de manière horizontale ou diagonale à des hauteurs prédéterminées au-dessus du sol, et une structure (33) agencée au centre de la voie de passage (30) qui a un plafond bas qui nécessite qu'un utilisateur passe de la position debout à la position pliée, une position accroupie ou une position à quatre pattes.

4. Procédé selon la revendication 1, dans lequel :

l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (2) est une voie de passage ascendante en méandres (40) ayant une largeur et une longueur prédéterminées, et plusieurs saillies (41, 42, 43) ou trous (44) sont prévus sur ladite voie de passage afin qu'un utilisateur fasse une ou plusieurs des activités suivantes : grimper et sauter ; sauter par-dessus ; grimper ou descendre en courant ; ou grimper tout en évitant les obstacles.

5. Procédé selon la revendication 1, dans lequel :

l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (3) se compose d'une voie de passage (50) qui, sur la majeure partie de sa longueur, se compose de deux surfaces séparées (51, 52) sur lesquelles on marche (ci-après « surfaces de marche »), une pour chacune des jambes de l'utilisateur, dont chaque surface de marche a une largeur, une hauteur et une longueur prédéterminées, et dont la voie de passage est telle que dans certaines parties, une surface de marche est plus haute que l'autre ; la voie de passage (50) a une ou plusieurs parties où les deux surfaces de marche (51, 52) sont séparées l'une de l'autre (partie(s) de surfaces de marche séparées) et une ou plusieurs parties où les deux surfaces de marche convergent en une (partie(s) de surfaces de marche réunies) ; et la (les) partie(s) de surfaces de marche séparées comprend (comprennent) une ou plusieurs sections où l'utilisateur peut ou doit marcher avec ses jambes écartées, ainsi qu'une ou plusieurs sections où les deux surfaces de marche sont de différentes hauteurs, et une ou plusieurs sections où les deux surfaces de marche ont la même hauteur.

6. Procédé selon la revendication 1, dans lequel l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (4) se compose d'une voie de passage (60) ayant une largeur, une hauteur et une longueur prédéterminées et la voie de passage (60) est agencée de sorte que :

elle serpente du début à la fin ; et elle comprend une partie où la surface de marche monte et descend, une partie où la surface de marche est horizontale, une partie où la surface de marche est inclinée d'un côté, et une partie où la surface de marche

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est inclinée des deux côtés, avec le centre de la surface de marche qui est une limite entre les deux côtés.

7. Procédé selon la revendication 1, dans lequel :

5 l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (5) est une voie de passage présentant des méandres (70) ayant une longueur prédéterminée et une paroi centrale (71) qui divise la voie de passage (70) en deux trajectoires, avec ladite paroi centrale (71) dotée de plusieurs trous traversants (72) dans lesquels un utilisateur peut insérer ses bras afin de supporter son corps, et
10 ayant une partie approximativement verticale, une partie inclinée et une partie qui est incurvée sur les deux faces latérales.

8. Procédé selon la revendication 1, dans lequel :

15 l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (6) se compose d'une voie de passage en forme de tunnel (80) dans laquelle des tuyaux en forme de U inversé (81) sont agencés de manière continue à intervalles prédéterminés ;
on utilise des tuyaux (81) de différentes hauteurs de sorte que la voie de passage (80) a une partie dans laquelle l'utilisateur peut marcher droit, une partie dans laquelle l'utilisateur doit se plier afin d'avancer et une partie dans laquelle un utilisateur doit s'accroupir pour avancer ;
20 les tuyaux (81) s'inclinent à droite ou à gauche de sorte que la voie de passage a une ou plusieurs parties où un utilisateur doit se plier à droite ou à gauche afin d'avancer.

9. Procédé selon la revendication 1, dans lequel l'un quelconque des dispositifs/éléments caractéristiques liés à l'exercice (7) est une voie de passage (90) de longueur prédéterminée, et est agencée de sorte que les méandres montent et descendent et vont à droite et à gauche, et est équipée avec:

25 deux rails (91, 92), l'un du côté droit et l'autre du côté gauche de la voie de passage, dont les rails (91, 92) sont agencés de sorte qu'ils sont parfois inclinés vers le haut et parfois inclinés vers le bas, et parfois sont dirigés à gauche et parfois à droite,
30 des raccords métalliques (93, 94) qui sont montés sur les rails (91, 92) et qui coulissent vers l'avant et vers l'arrière, et
une série interconnectée d'anneaux de suspension (95, 96) qui sont raccordés aux raccords métalliques.

10. Procédé selon la revendication 1, dans lequel tous les dispositifs/éléments caractéristiques liés à l'exercice sont logés dans un long dôme (100) réalisé à partir de mousse de polystyrène.

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50

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Fig. 1

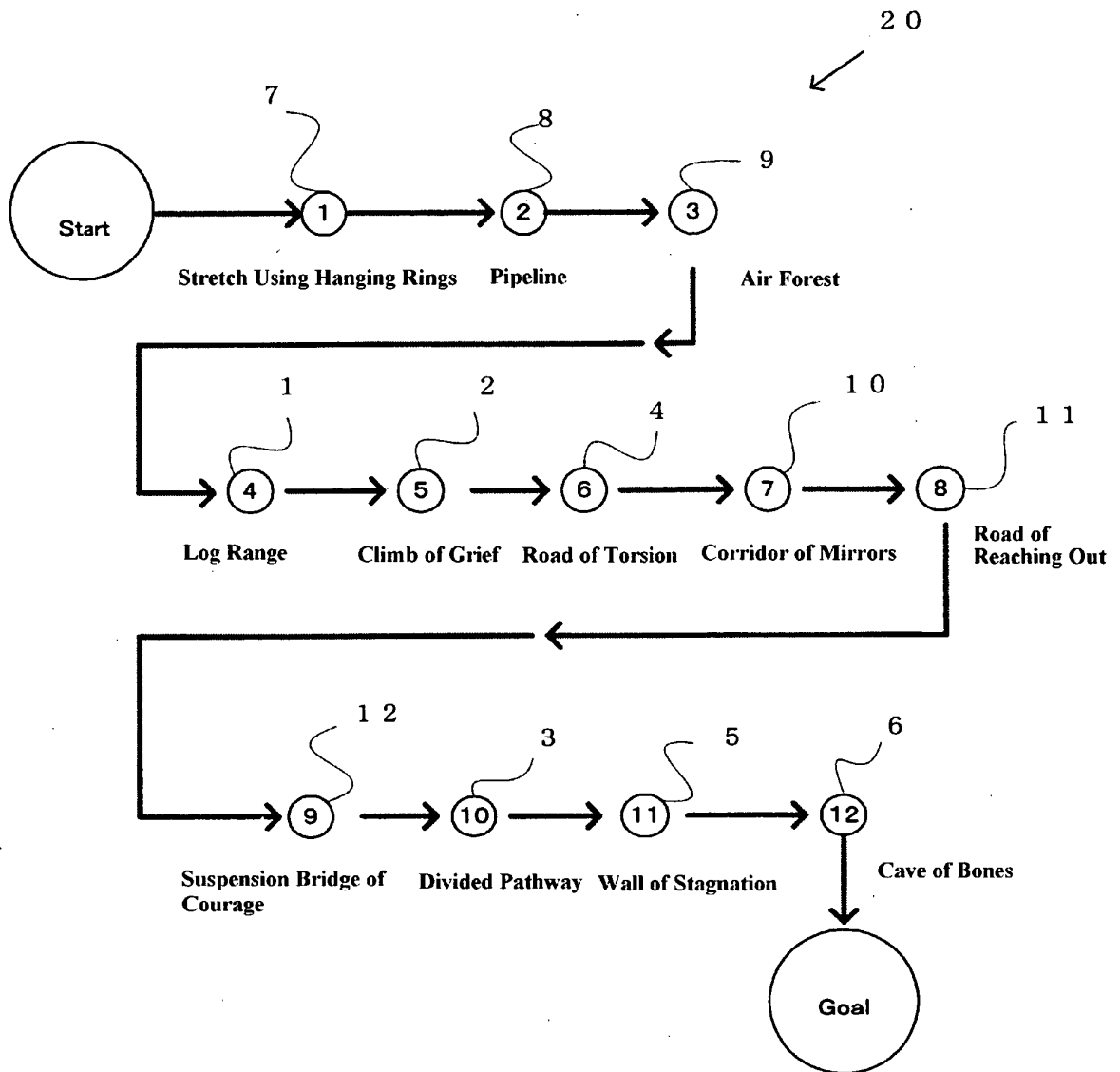


Fig. 2

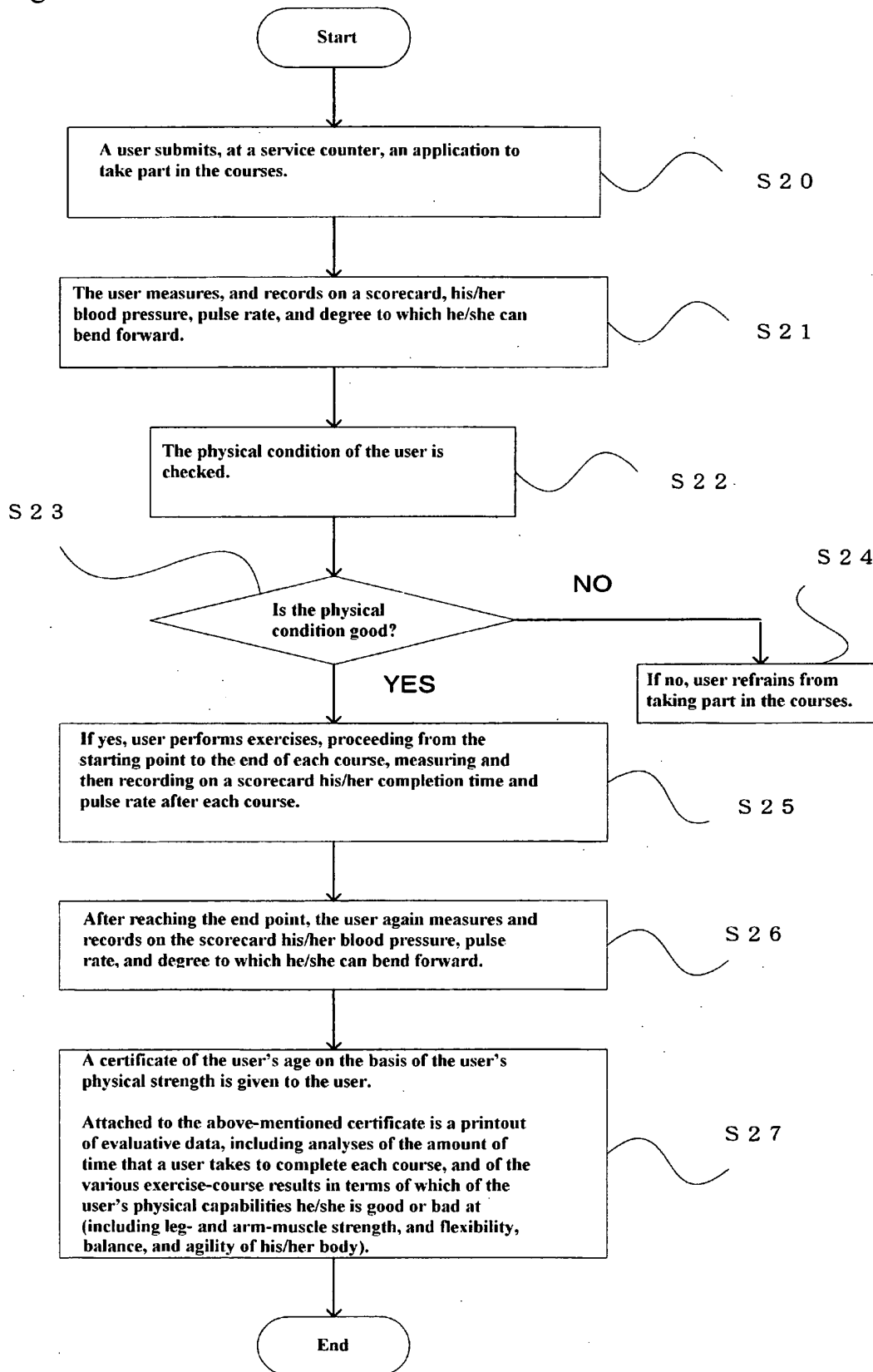


Fig. 3

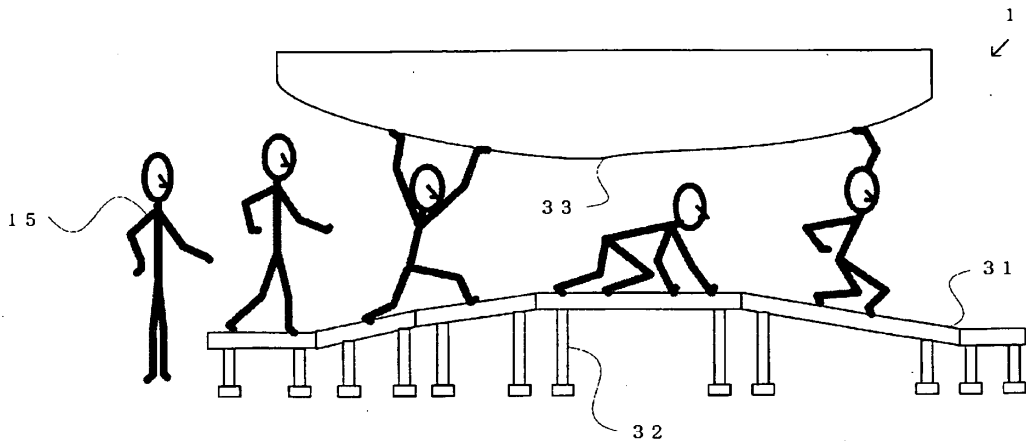


Fig. 4

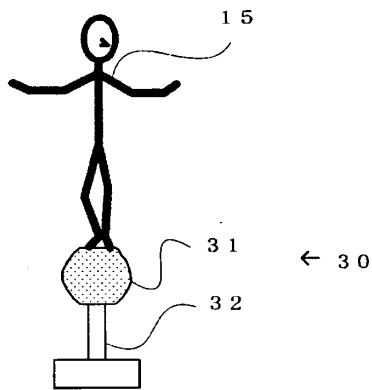


Fig. 5

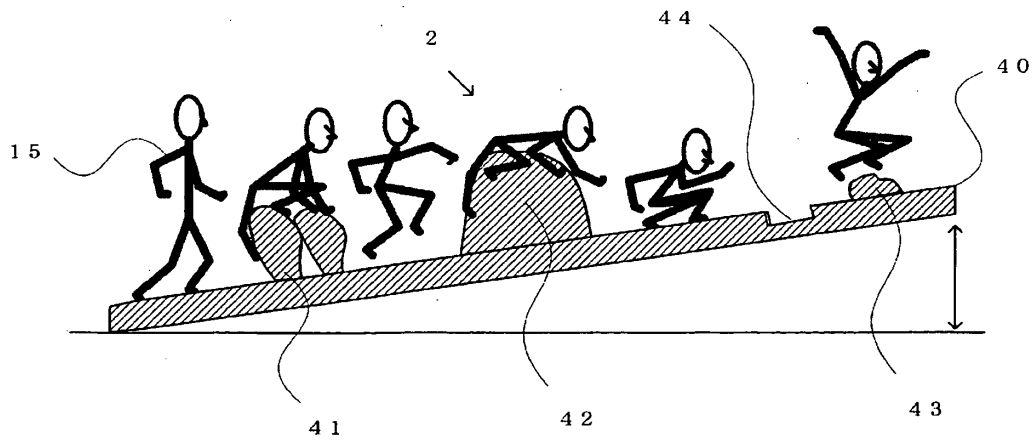


Fig. 6

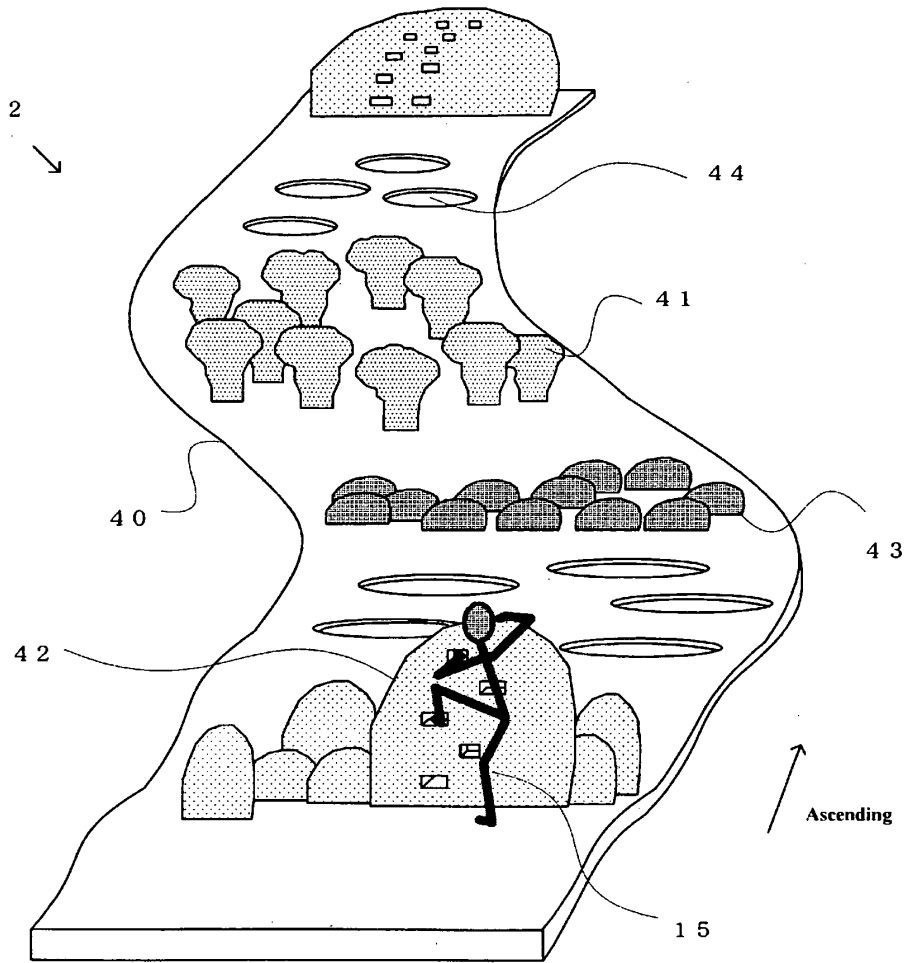


Fig. 7

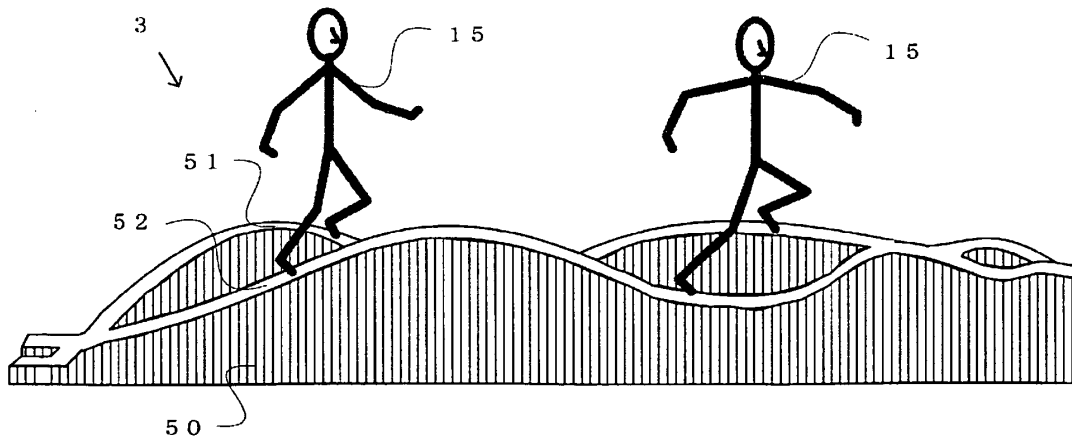


Fig. 8A

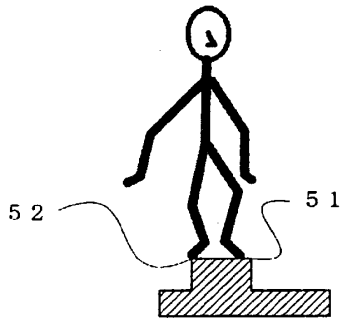


Fig. 8B

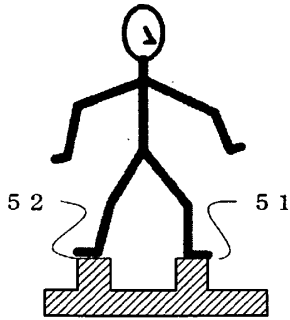


Fig. 8C

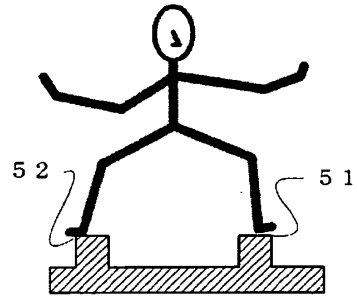


Fig. 8D

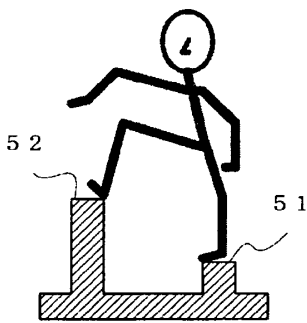


Fig. 8E

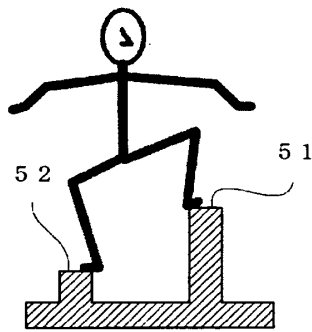


Fig. 8F

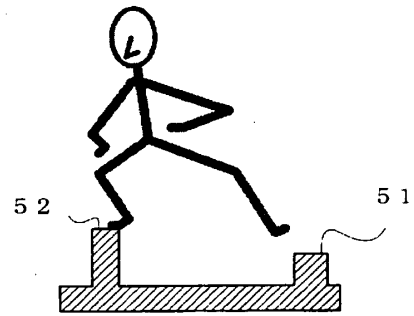


Fig. 9

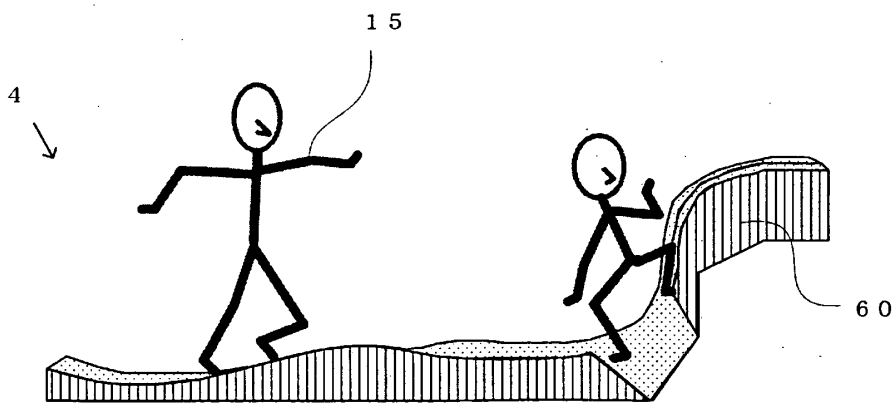


Fig. 10A

Fig. 10B

Fig. 10C

Fig. 10D

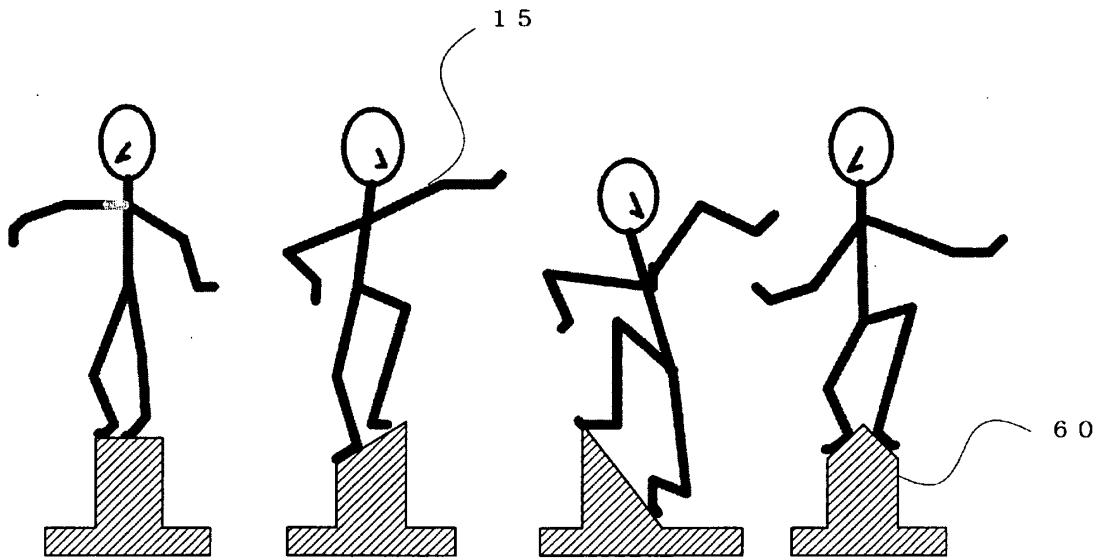


Fig. 11

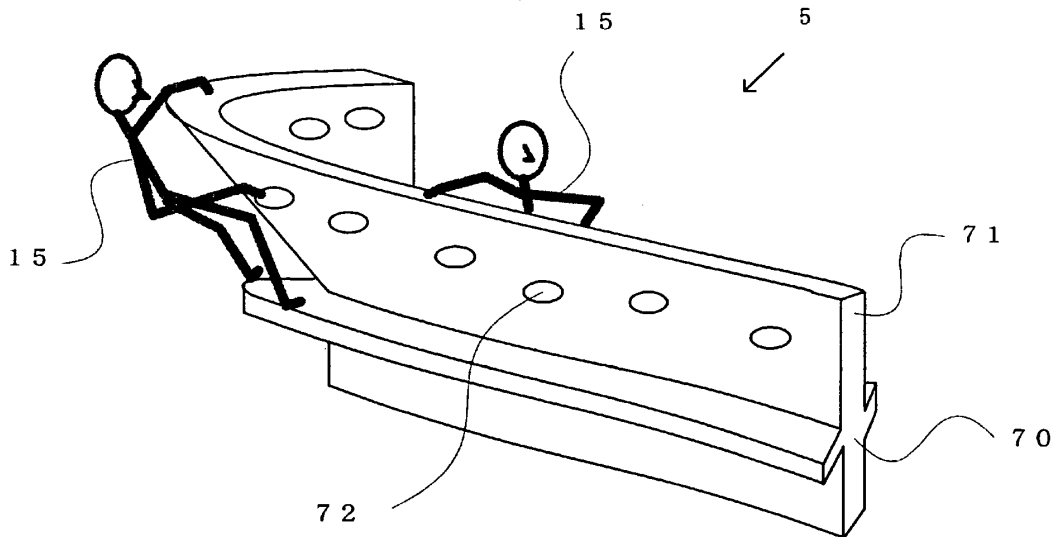


Fig. 12A

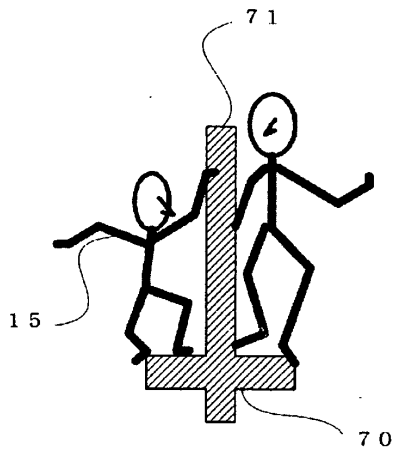


Fig. 12B

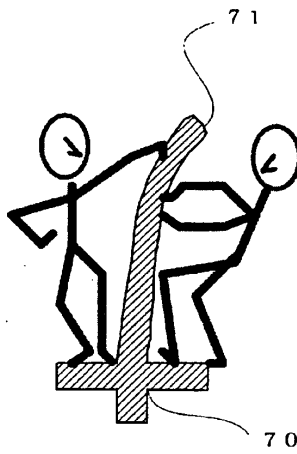


Fig. 12C

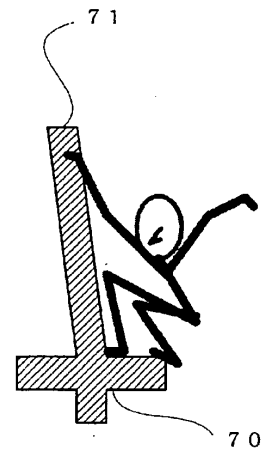


Fig. 13

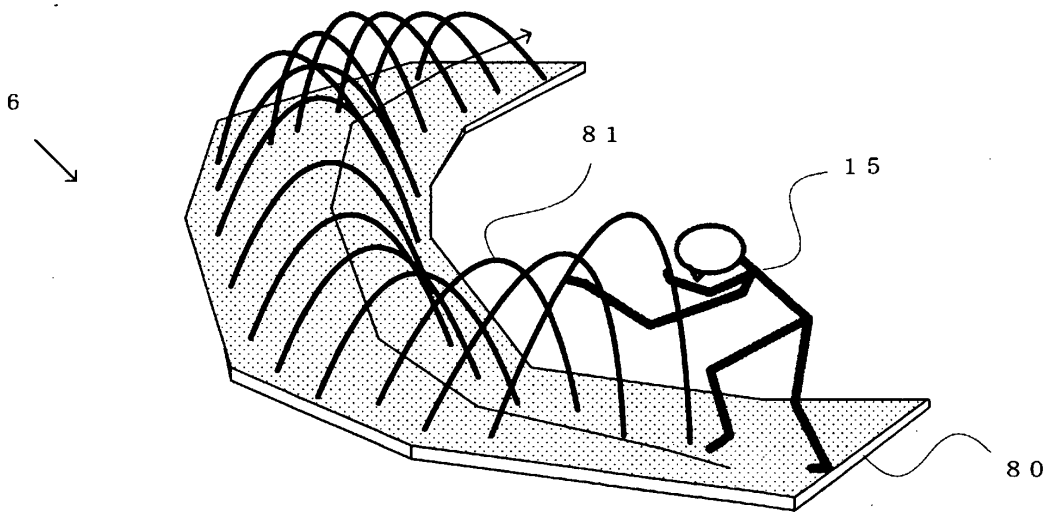


Fig. 14A

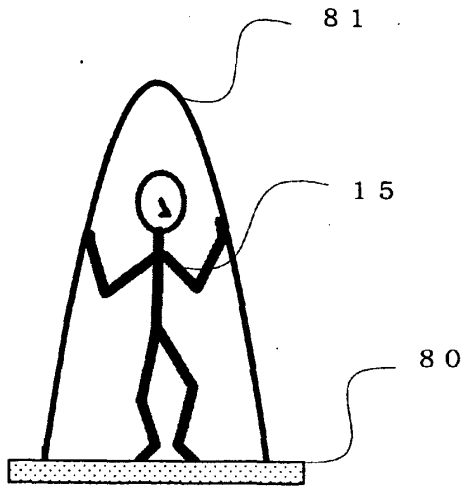


Fig. 14B

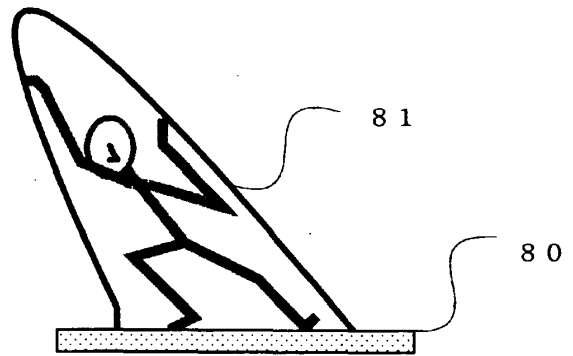


Fig. 14C

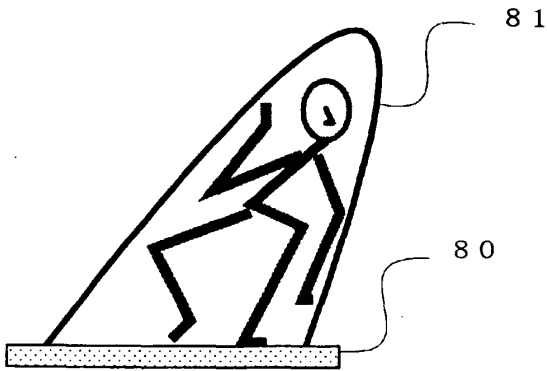


Fig. 14D

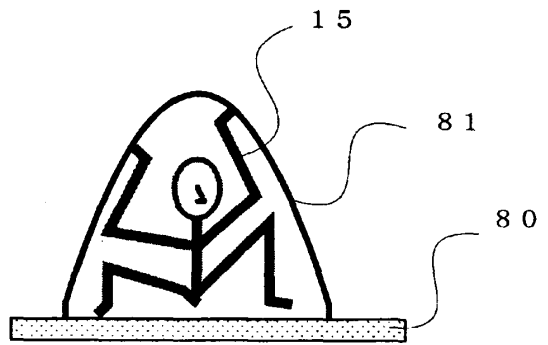


Fig. 15

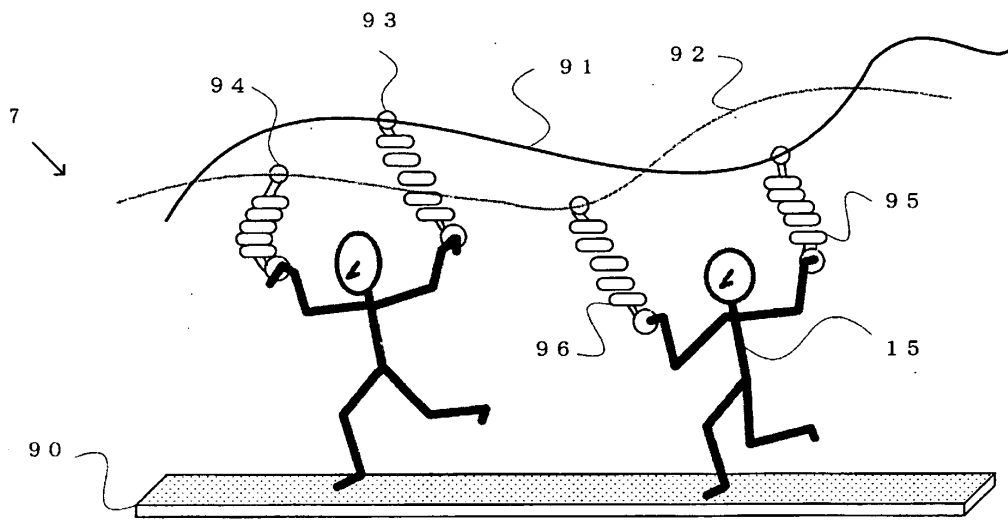


Fig. 16A

Fig. 16B

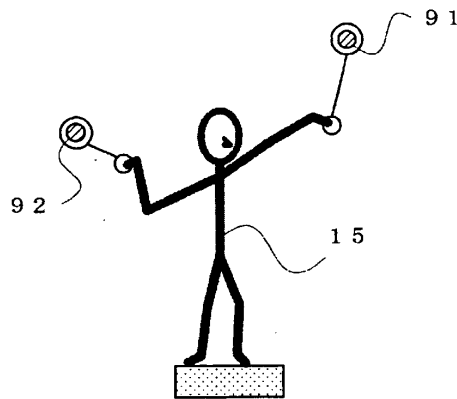
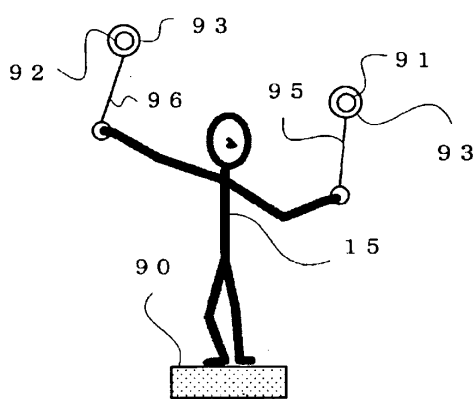


Fig. 16C

Fig. 16D

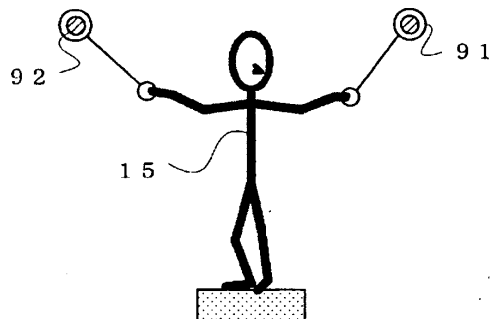
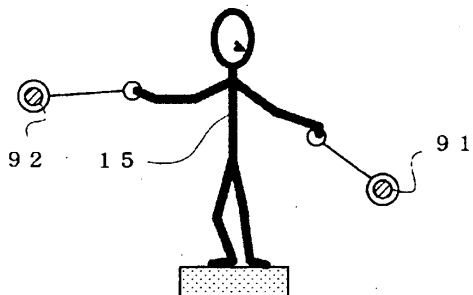


Fig. 17

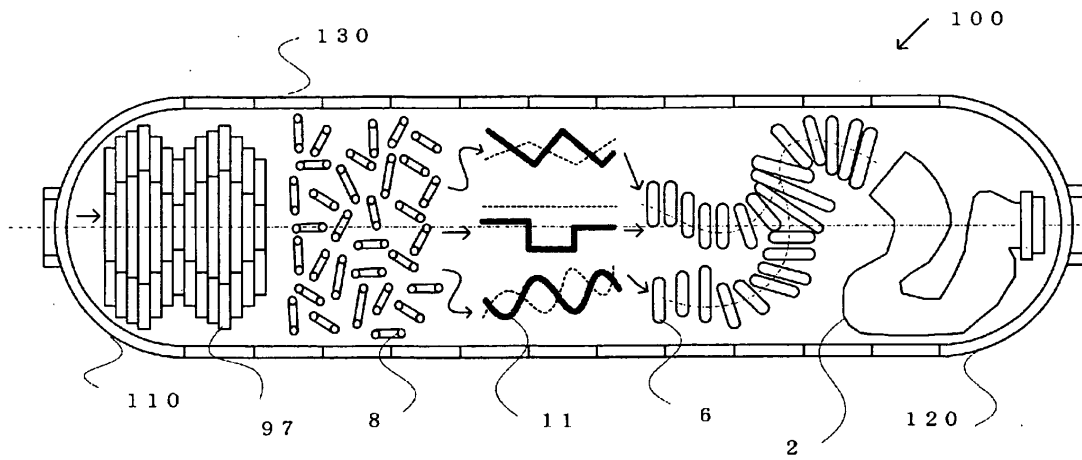
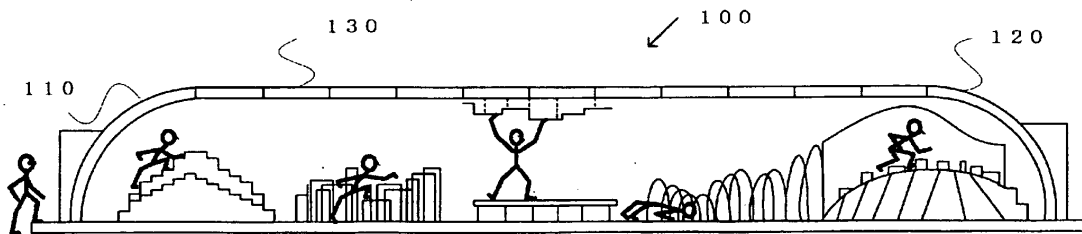


Fig. 18



REFERENCES CITED IN THE DESCRIPTION

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专利名称(译)	体力年龄测量方法		
公开(公告)号	EP1854510B1	公开(公告)日	2012-04-04
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[标]申请(专利权)人(译)	日本贸易有限公司		
申请(专利权)人(译)	YUGENKAISHA JAPAN TSUSYO		
当前申请(专利权)人(译)	YUGENKAISHA JAPAN TSUSYO		
[标]发明人	KITAGAWA KATSUYUKI C O HOKKO SOHGOH KAIHATSU		
发明人	KITAGAWA, KATSUYUKI C/O HOKKO SOHGOH KAIHATSU		
IPC分类号	A61B5/00 A63B17/00 A63B24/00 A63B26/00 G06F19/00		
CPC分类号	A63B17/00 A63B24/0062 A63B26/00 A63B2024/0065 A63B2230/00 G06F19/3481 G16H20/30		
其他公开文献	EP1854510A1 EP1854510A4		
外部链接	Espacenet		

摘要(译)

一种用于根据他/她的体力测量人的年龄的系统，其中所述系统被提供多个锻炼课程，其使得用户执行各种锻炼而不会使用户负担过重并且包括娱乐因素，并且其中可以计算，基于用户完成每个课程和所有课程所花费的时间量，基于用户的体力和用户可以执行各种锻炼动作的程度的年龄。该系统由多个课程组成，其中提供了各种锻炼设备或其他特征。形成运动课程以使用户展示各种身体能力，包括他/她身体的多个部分的肌肉力量，身体的柔韧性，身体的平衡和身体的敏捷性。课程的结构使得每门课程的个人锻炼能力的数量被编入索引，并且一个锻炼课程的指数值的组合与每个其他课程的指数值的组合不同。基于用户的体力的年龄基于用户完成所有课程所花费的总时间来计算，并且基于用户的时间量来评估用户的个体身体能力。完成每门课程。

[Table 3]

Course	Legs	Arms	Flexibility	Balance	Agility	Intelligence
Log Range	6	4	9	10	4	6
Climb of Grief	7	6	6	6	8	6
Divided Pathway	7	2	9	9	9	2
Road of Torsion	7	3	6	10	5	3
Wall of Stagnation	4	8	7	7	4	4
Cave of Bones	4	5	10	7	4	4
Stretch with Hanging Rings	4	6	10	3	5	2