



(51) International Patent Classification:

A63B 23/04 (2006.01) A43B 17/03 (2006.01)
A43B 7/14 (2006.01) A43C 11/02 (2006.01)
A43B 7/30 (2006.01) A61H 1/02 (2006.01)
A43B 13/40 (2006.01) A63B 23/10 (2006.01)
A43B 17/00 (2006.01)

(21) International Application Number:

PCT/CZ2015/000139

(22) International Filing Date:

13 November 2015 (13.11.2015)

(25) Filing Language:

Czech

(26) Publication Language:

English

(30) Priority Data:

PV 2014-790 14 November 2014 (14.11.2014) CZ

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,
MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,
PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,
SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,
TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

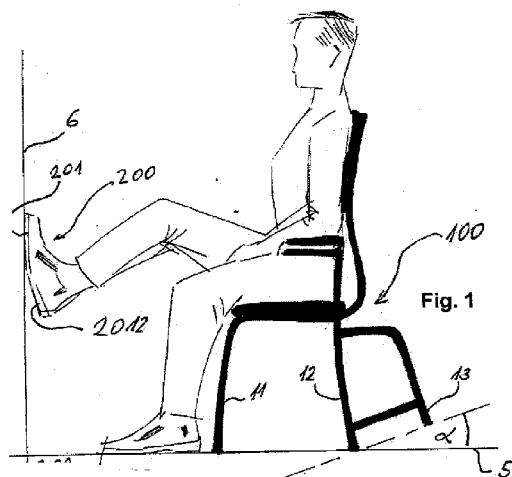
— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

[Continued on next page]

(54) Title: METHOD OF EXERCISING FOR STRENGTHENING MUSCLES AND KEEPING PEOPLE IN GOOD FORM, A
MEANS OF EXERCISING AND A SYSTEM OF EXERCISING



(57) Abstract: The method of exercising for strengthening muscles and keeping people in good form, in which the exercising person undergoes the synergistic effect of a shoe (200) according to CZ PV 2012-132, which accommodates a biomechanical insole (210) according to CZ PV 2009-580 or CZ 298894, the upper of the shoe comprising at least one elastic insertion (202), and of a means of exercising (100), whereby the exercising person leans with the shoe (200) of one leg against a vertical obstacle (6), sitting on a seat (2) of the means of exercising (100), leaning on its backrest (3), whereby the other leg is hanging freely downwards, while the leaning leg is alternately bent and straightened, thereby swinging the means of exercising (100) via its rear legs (12) between the basic position, in which the means of exercising (100) stands on the front legs (11) and on the rear legs (12), and the rear position, in which the means of exercising (100) stands on the rear legs (12) and the auxiliary legs (13), arranged behind the rear legs (12), and the front legs (11) are raised above the mat (5), whereby the shoe (200) of the exerciser rests on the obstacle (6) with the front part (2011) of the sole (201) of the shoe (200), the leg being bent (200) and with the whole sole (201) of the shoe (200), including the rear part (2012) of the sole (201), while the leg is straight.



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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

Method of exercising for strengthening muscles and keeping people in good form, a means of exercising and a system of exercising

5 Technical field

The invention relates to a method of exercising for strengthening muscles and keeping people in good form.

Nevertheless, the invention also relates to a means of exercising for strengthening muscles and keeping people in good form to perform the method
10 according to the invention, whereby the means of exercising has at least two rear legs or any support replacing these legs and one or two front legs or a construction replacing these legs.

The invention relates to a system of exercising for strengthening muscles and keeping people in good shape.

15

Background art

There are numerous known systems for strengthening muscles and keeping people in good form. These systems usually vary from simple to complex workout machines. Complex and bulky equipment is designed for
20 fitness centers and gyms, while small machines can also be used at home. Domestic devices include, for example, exercise bikes, various walkers or rotating platforms.

US2003144115A1 describes an exercise device for leg exercises, which comprises a pair of foot pedals connected to telescopic rods which telescope
25 into and out of bearing blocks, in which are mounted springs exerting pressure against the strength of the exercising person's legs when being pressed and cause the rods to return to the ejected position. The exercising person sits and presses his or her legs against the foot pedals which provide resistance to compression and when released they cause the foot to return to the initial
30 position. The device serves to strengthen leg muscles, as the exercising person has to develop considerable strength to actuate the pedals so that the exercise would be meaningful. This requires in fact an effort so intense that not every

would be meaningful. This requires in fact an effort so intense that not every person would be capable of making, however interested in this type of exercises he or she might be.

US2002193216A1 discloses an exercise device comprising a seat, a
5 movable backrest and a tread rod, against which lean the feet of the exercising person who sits with his/her legs bent and by straightening the legs lifts with his/her body the backrest to an upper position. The area of the treading as well as the direction of the foot on it is inclined from the vertical direction and the foot sole during the exercises does not change its position on the tread rod.
10 Exercising on this device seems to be very strenuous.

JPH07204291 describes an exercise device which enables various movements of various parts of the exercising person's body. It is also possible to exercise on the device with one leg, whose foot sole rests upon the pedal.

Each of these devices is aimed at exercising and strengthening a
15 particular part of the body, whereby the remaining parts are neglected, either being trained on a respective device little or not at all.

The aim of the invention is therefore to provide a system of exercising to strengthen muscles and keep people in good form, which would affect exercising more parts of the body of the exerciser and the method of exercising
20 would be at the same time simple, easy to implement and repeatable even for people with mobility disabilities. Furthermore, the aim of the invention is to devise a means for performing the method of exercising by the system according to the invention, which would be simple, readily available and would not be too large or too heavy.

25

Principle of the invention

The goal of the invention is achieved by exercising for strengthening muscles and keeping people in good shape according to the invention, whose
30 principle consists in that the exercising person undergoes a synergistic effect of a shoe according to CZ PV 2012-132, which accommodates a biomechanical

insole according to CZ PV 2009-580 or CZ 298894, with which he or she leans against a vertical obstacle, and of the means of exercising, whereby the person sits on the seat of the means of exercising, resting on the backrest with one leg leaning against the obstacle, whereby he or she alternately bends and
5 straightens his/her leg, thus swinging the means of exercising via its rear legs between the basic position, in which the means of exercising stands on the front and rear legs, and the rear position, in which the means of exercising stands on the rear legs and the auxiliary legs arranged behind the rear legs and the front legs of the means of exercising are raised above the mat, whereby the
10 exercising person's shoe rests on the obstacle with the front part of the shoe sole when the leg is bent, and with the whole shoe sole, including the rear part of the sole, when the leg is straight.

So as to achieve optimum results of exercising, it is advantageous when the means of exercising moves from the basic position by straightening the
15 exerciser's leg to the rear position, whereby in the basic position the means of exercising stands on the front and rear legs and the bent leg of the exerciser leans against an obstacle, for example, against a wall, with the front part of the shoe sole, in which the front part of the exerciser's foot rests on the biomechanical insole, whereby the big toe joint engages the recess for the toe
20 joint in the insole and the distal phalanx of the big toe rests on the insole and so do along with it also the distal phalanges of the other toes. On the other hand, in the rear position the means of exercising stands on the rear legs and the auxiliary legs and the straight leg of the exercising person leans against the obstacle with the entire sole of the shoe, in which the foot rests on the
25 biomechanical insole, whereby the big toe joint engages the recess for the big toe joint and rests on the insole in it together with the joints of the other toes and the heel, which abuts a heel recess or a heel hole in the insole. The toes are in this position straightened and their distal phalanges touch the insole. During transition from one position to the other, the instep of the foot presses and
30 releases the instep portion of the upper part of the shoe against the forces of the elastic insertions, and so the instep of the foot is not pushed towards the sole. If the shoe is also provided with elastic insertions in the heel area, then

during transition from one position to the other the heel alternately presses and releases these elastic insertions.

During the transition of the exerciser's foot in the shoe from the basic position to the rear position and back while alternately loading the toe tendons, especially the distal phalanx of the big toe, and the heel tendons, the muscles of the foot are activated, thus releasing transverse and longitudinal arches of the foot. The activation of the foot muscles is automatically followed by the activation of the other muscles, especially calf muscles, thigh muscles, gluteal muscles, inguinal muscles, stomach muscles, back muscles, including diaphragm and the other muscles. Thus the lymphatic system is activated, improving the movement of the body fluids, especially from the lower limbs. Improvement in the return of blood from the lower limbs means better oxidation of the muscles, which results in improved oxidation of the muscle cells, neurons as well as the other cells of the organism, including the passive cells.

The principle of the means of exercising for strengthening muscles and keeping people in good form for performing the method of exercising according to the invention, whereby the means of exercising has at least two rear legs or any support replacing these legs and one or two front legs or a construction replacing these legs, consists in that on the exercising means behind the rear legs are formed auxiliary legs whose ends are in a position in which the means of exercising stands on the front legs and rear legs, above the mat. That also means that after tilting the means of exercising to the rear position, in which it stands on the rear legs and the auxiliary legs, the front legs are raised above the mat. The foot then moves between these two positions and by alternating the support points between the foot and the biomechanical insole, especially by resting on the distal phalanx of the big toe, the big toe joint and the heel, all the muscles of the sole and the foot are activated and, consequently, so are other muscles of the exercising person.

In a preferred embodiment, the plane interlaid by the ends of the rear legs of the means of exercising forms with the ends of the auxiliary legs an angle ranging from 10° to 40°, preferably from 20° to 30°.

In order to allow the use of the means of exercising in zero gravity, the rear legs are mounted tiltably on a hinge, which is mounted displaceably on the mat with a option of fixing its current position.

Especially for the people who have reduced ability to control lower limbs, the front part of the means of exercising is aligned with supports for the exercising leg to be rested comfortably on them, whereby the leg need not be held by the leg muscles, but is loosely placed on the support. In cases when the exercising person is not able to control the exercising leg himself/herself, he/she may be helped by another person.

If the support for the exercising leg is a part of the means of exercising, it is advantageous if the support is coupled with a footrest for the foot sole of the exercising leg, whereby the distance between the footrest for the foot and the means of exercising is adjustable. The footrest in this solution replaces the obstacle.

To increase the self-reliance of the person who is unable to control the exercising leg by means of its muscles, it is advantageous if at least on one side of the means of exercising is pivoted a lever which can be coupled with the exerciser's leg for the manual handling of the exercising leg.

In another of possible embodiments, the means of exercising can be provided with a compression spring, which is inserted between the end of the auxiliary legs and the mat. The compression spring helps to return the means of exercising from the rear position to the basic position and increases the force required for the straightening of the exercising leg, which is necessary, for example, when using the means of exercising in zero gravity.

The principle of the system of exercising for strengthening muscles consists in that it comprises a shoe according to CZ PV 2012-132, which accommodates a biomechanical insole according to CZ PV 2009-580 or CZ 298894 and the upper of the shoe comprises at least one elastic insertion, and the system also contains a means of exercising.

Description of drawings

The system of exercising, the method of exercising when using the system and the means of exercising according to the invention will be described in a greater detail on the basis of the schematic drawings, where Fig. 1 shows a person doing exercises using the method according to the invention with the means of exercising in the basic position, Fig. 2 shows a person doing exercises using the method according to the invention with the means of exercising in the rear position, Fig. 3 illustrates a shoe according to CZ PV 2012-132, Fig. 4 shows a biomechanical insole according to CZ PV 2009-580, Fig. 5 illustrates the means of exercising in the basic position, whereas Fig. 6 shows the means of exercising in the rear position. Fig. 7 shows the means of exercising with a support for the exercising leg and a lever for the manual handling of the exercising leg in the basic position and, finally, Fig. 8 illustrates the means of exercising according to Fig. 7 provided in addition with a footrest for the foot sole of the exercising leg in the rear position.

Specific description

The system of exercising for strengthening muscles and keeping people in good form is based on the fact that the exercising person undergoes the synergistic effect of a shoe according to CZ PV 2012-132, which accommodates a biomechanical insole according to CZ PV 2009-580 or CZ 298894, with which the exercising person leans against a vertical obstacle, and of the means of exercising. The means of exercising for strengthening muscles and keeping people in good shape has at least two rear legs or any suitable support replacing these legs and one or two front legs or a construction replacing these legs. Behind the rear legs on the means of exercising are formed auxiliary legs, whose ends are situated above the mat in a position in which the means of exercising stands on the front legs and rear legs. At the same time, that means that after tilting the means of exercising to the rear position, in which it stands on the rear legs and auxiliary legs, the front legs are raised above the mat.

The invention will be described on the basic embodiment of the means of exercising 100, whose fundamental part is a chair which consists of four legs 1, on which is mounted a seat 2 and a backrest 3 is attached in a known manner to the legs 1. In the embodiment according to Fig. 5 and 6, armrests 4 are
5 attached to the legs. However, they do not have to be used in other embodiments. Auxiliary legs 13 are formed behind the rear legs 12 of the means of exercising 100. In a position when the means of exercising 100 stands on the front legs 11 and on the rear legs 12, the ends of the auxiliary legs 13 are situated above the mat 5. The plane interlaid by the ends of the rear
10 legs 12 and the ends of the auxiliary legs 13 forms with the mat 5 an angle α , whose size is in the range from 10° to 40°, preferably from 20° to 30°.

Given the knowledge of the existing chairs, it is evident that the front legs 11 of the means of exercising 100 can be replaced with any known support, or only one front leg can be used. Also the rear legs 12 of the means of exercising
15 100 as well as its auxiliary legs 13 can be replaced with any suitable support. For all these variants, the expressions front legs, rear legs and auxiliary legs will be used in the following description and in the claims.

In an unillustrated alternative embodiment, the rear legs 12 are mounted swingingly on a hinge, which is mounted on the mat 5 displaceably with respect
20 to the obstacle 6 with a option of fixing its position. Also, it appears advantageous to design the mat 5 as a part of the means of exercising 100, for example, a pair of skids, on which the rear legs would be pivoted by means of pivots, and the whole means of exercising would be floor-mounted on its skids, which may be made in any known manner, for example from strips, a tube, a
25 square profile etc. This embodiment would allow to use the means of exercising 100 even under zero-gravity conditions, for example at orbital stations for training the crew members, however, for that purpose it would have to be supplemented by compression springs, arranged between the ends of the auxiliary legs 13 and the mat 5, whereby it would have to be provided with belts
30 which ensure the position of the exercising person on the means of exercising 100.

Fig. 7 and 8 illustrate adjustments to the means of exercising 100 to be used by persons who have reduced ability to control lower limbs. The front part

of the means of exercising 100 is aligned with a support 7 for placing the foot on it. The support 7 may be a part of the means of exercising 100, as is shown in Fig. 7 and 8, or it may be made as an independent member.

If the support 7 for the exercising leg is a part of the means of exercising
5 100, and the footrest 8 for the foot of the exercising leg can be attached to it, whereby the footrest 8 replaces the obstacle 6. In this embodiment, the distance between the footrest 8 and the means of exercising 100 must be adjustable, as is, for example, shown in Fig. 7 and 8, where the support 7 and the footrest 8 are mounted on telescopic member.

10 To increase the independence of the person who is unable to control the exercising leg by its muscles, a variant has been designed, illustrated in Fig. 7 and 8, where at least on one side of the means of exercising 100 is pivoted a lever 9, which can be coupled with the exercising person's leg for the manual handling of the exercising leg. The lever 9 can be mounted on both sides of the
15 means of exercising 100.

The compression springs between the ends of the auxiliary legs 13 and the mat 5 can be arranged in all the described embodiments, whereby they can considerably help the exercisers who have only one leg with returning the means of exercising 100 from the rear position to the basic position.

20 The above-described means of exercising 100 is able to occupy two positions. In the basic position, shown in Fig. 1, 5 and 7, the means of exercising 100 stands on the front legs 11 and on the rear legs 12. In the rear position/position tilted to the rear, shown in Fig. 2, 6 and 8, the means of exercising 100 stands on the rear legs 12 and on the auxiliary legs 13.

25 If a person who is not aware of the synergistic effect of the shoe 200 according to CZ PV 2012-132 and of the above-mentioned means of exercising 100, starts exercising on the means of exercising, he/she sits on the means of exercising 100 in the basic position, one foot is just left resting on the floor, while the other bare foot, slightly bent, leans against a wall or another vertical
30 obstacle 6, similarly to what is shown in Fig. 3, but bare-footed. The foot leans against the obstacle 6 with the front part of the sole, i.e. with the big toe joint and the little toe joint, while the other toes and their toe joints only touch it. After

straightening the foot on the obstacle 6 the foot is stretched out into a nearly horizontal position, by which means the exercising person tilts the means of exercising 100 into the rear position, in a similar manner as is shown in Fig. 4, but it is done bare-footed, and the foot leans against the obstacle 6 also with the heel, thus leaning against the wall at three points. The other parts of the foot only touch the obstacle 6. After releasing the leg, due to the weight of the exercising person, especially his/her other leg hanging loosely downwards, the means of exercising 100 returns to the basic position and the leaning leg is bent, whereby the heel moves away from the obstacle 6, on which the leg leans after relaxing only with the big toe joint and the little toe joint, whereas with the other toes and their toe joints it only touches it. However, in this manner the exercising person will not achieve the effects of the exercises according to the invention.

So as to achieve a perfect effect of the system and method of exercising according to the invention, it is necessary for the exercising person to wear the shoes 200 according to PV 2012-132, which are provided with a biomechanical insole 210 according to CZ 298894 or according to CZ PV 2009-580, or biomechanical insole 210 at least according to CZ 298894, preferably biomechanical insole according to CZ 298894, as well as according to CZ PV 2009-580, is attached to the foot sole of the exercising person in a similar manner as if it was accommodated in the shoe, for example by elastic bands. In the case of using the biomechanical insole 210 in common shoes, the effects of the biomechanical insole 210 are reduced by the firm instep of the common shoes.

The shoe according to PV 2012-132 comprises a sole 201, to which is connected an upper of the shoe, and inside the shoe is accommodated a biomechanical insole 210, whereby the upper of the shoe 200 comprises in the area of the foot instep at least one flexible instep insertion 202, which reduces the pressure of the upper of the shoe 200 on the foot instep, usually it comprises two flexible instep insertions 202, and in a preferred embodiment it comprises elastic insertions 203 in the heel section of the shoe.

The shoe 200 according to CZ PV2012-132 is based on a synergistic interaction of the biomechanical insole 210 and the elastic insertions 202, 203 in

the upper of the shoe at least in the instep area, thereby preventing excessive load on the instep and fallen arches of the foot (both the transverse and longitudinal arches). The biomechanical insole 210 according to CZ 298894 or according to CZ PV 2009-580 is accommodated in the shoe 200 according to the requirements firmly (stretching insole) or removably (inserting insole), and on its upper side it has at least a recess 211 for the big toe joint and a depression 212 of the insole for the heel bone. Due to this recess and depression, the biomechanical insole keeps the foot in a natural position and contributes to appropriate distribution of the human body weight among its main support points on the sole, both during static standing and during walking. During static standing, the support points in the shoe 200 according to CZ PV 2012-132 are formed by the big toe joint, the toe joints and the heel bone, whereby the distal phalanges of the toes only touch the biomechanical insole. When walking, the foot gradually moves after lifting the heel from the static position to a position in which it leans on the biomechanical insole 210 with the distal phalanx of the big toe and the distal phalanges of the other toes, whereby the big toe is in the recess 211 for the big toe joint, or it is even raised from it during very intense walking.

The recess 211 for the big toe joint and depression for the heel bone or a hole for the heel bone simultaneously contribute to reaching the right position of the whole lower limb, whereby during walking, standing, as well as during sitting, they not only relieve its so far overly strained parts, particularly ligaments and joints, but also the spine. As a result, the whole body gets straight and its center of gravity is shifted into a natural position. The extensors and flexors of the toes, as well as Achilles tendon and other muscles or tendons of the foot are fully functional, being loaded in an appropriate and natural manner. Thus, the foot is gradually formed into its natural shape, and the transverse and longitudinal arches are strengthened or restored.

The biomechanical insole 210 according to CZ 298894 is provided from the upper side with shaping which corresponds to the form of the impression of the lower part of the human sole with the recess 211 for the big toe joint and a smooth toe section, while from the lower part it is provided with shaping which corresponds to the lower part of the human sole with a smooth toe section,

whereby the biomechanical insole 210 flexibly supports all the parts of the sole between the toe section and the heel section. According to CZ PV 2009-580, this biomechanical insole 210 has a recess or depression 212 the heel section, in which a heel hole is formed, which further improves the position of the feet on the biomechanical insoles 210 also with respect to the mat, on which
5 the person is standing or on which he/she is walking.

If the exercising person is wearing the shoes 200 according to CZ PV 2012-132 during exercising, with the biomechanical insole 210 accommodated in them according to CZ 298894, as well as according to CZ PV 2009-580, in
10 the basic position of the means of exercising 100 one slightly bent leg of the exercising person leans against the obstacle 6 with the front part 2011 of the sole 201 of the shoe 200 and the front part of the sole rests on the biomechanical insole 210 accommodated in the shoe 200, whereby the big toe joint is in the recess 211 for the big toe joint. As a result, the front part of the
15 foot rests on the biomechanical insole 210 also with the other toe joints and especially with the distal phalanx of the big toe. The distal phalanges of the other toes also rest on the insole 210. After straightening the foot against the obstacle 6 the foot stretches out into a substantially horizontal position, by which means the exercising person tilts the means of exercising 100 into the
20 rear position, shown in Fig. 2, 6 and 8. At the same time, the shoe 200 leans against the obstacle 6 also with the rear part 2012 of the sole 201 and the sole of the exercising person abuts with the heel on the depression 212 of the insole under the heel, or, to be more specific, the heel hole in the biomechanical insole 210. Simultaneously, the foot rests on the heel and the toe joints, especially on
25 the big toe joint. After releasing the leg, due to the weight of the exercising person and the weight of his/her free leg, the exercise device 100 returns to the basic position and the leaning leg is bent, whereby the rear part 2012 of the sole 201 of the shoe 200 lifts and the sole 201 of the shoe 200 maintains a contact with the obstacle 6 only with its front part 2011, and so the front part of
30 the foot sole leans against the biomechanical insole 210 in the same way as at the beginning of the cycle, which is subsequently repeated for a period of several minutes, whereupon the legs swap and the procedure with the other leg is the same as with the first one for the same period of time. Alternating support

points between the foot sole and the biomechanical insole **210**, which, apart from the above-mentioned, flexibly supports all the parts of the sole, results in the activation of the muscles of the foot sole, which alternates resting on the distal phalanx of the big toe, on the big toe joint and the heel, when the big toe
5 from the big toe joint to the distal phalanx constitutes the so-called extended rigid lever, whose inflexion and extension activates the other muscles of the sole and thus releases the transverse and longitudinal arches of the foot. Due to the activation of the foot sole, other muscles are activated, especially calf muscles, thigh muscles, gluteal muscles, inguinal muscles, stomach muscles,
10 back muscles, including diaphragm, and the other muscles. This leads to perfect activation of the lymphatic system of the whole body and improved return of blood, especially from the lower limbs, which means a better blood circulation in the muscles and, consequently, better oxidation of muscle cells, neurons as well as the other cells of the organism, including the passive cells.
15 Perfect activation of the lymphatic system results in improved removal of waste substances from the body.

Industrial applicability

The system of exercising, the method of exercising using the system and
20 the means of exercising according to the invention are suitable for a wide range of people to keep them in good shape, whereby both the shoe and the exercise apparatus are easy to produce, are not expensive and their application does not require special training or special spaces.

List of references

- 1 legs of the means of exercising
- 11 front legs
- 5 12 rear legs
- 13 auxiliary legs
- 2 seat
- 3 backrest
- 4 armrests
- 10 5 mat
- 6 obstacle
- 7 support of the exercising leg
- 8 footrest for the foot sole of the exercising leg
- 9 lever for the manual handling of the exercising leg
- 15 100 means of exercising
- 200 shoe according to CZ PV 2012-132
- 201 shoe sole
- 2011 front part of the sole
- 2012 rear part of the sole
- 20 202 elastic insertion in the instep section of the shoe
- 203 elastic insert in the heel section of the shoe
- 210 biomechanical insole according to CZ PV 2009-580
- 211 recess for the big toe joint
- 212 depression under the heel of the insole
- 25

PATENT CLAIMS

1. A method of exercising for strengthening muscles and keeping people in good form, **characterized in that** the exercising person undergoes the synergistic effect of a shoe (200) according to CZ PV 2012-132, which accommodates a biomechanical insole (210) according to CZ PV 2009-580 or CZ 298894, the upper of the shoe comprising at least one elastic insertion (202), and of the means of exercising (100), whereby the exercising person leans against a vertical obstacle (6) with the shoe (200) of one foot, sitting on a seat (2) of the means of exercising (100), leaning on its backrest (3), whereby the other leg is let hanging freely downwards, while the leaning leg is alternately bent and straightened, thereby swinging the means of exercising (100) via its rear legs (12) between the basic position, in which the means of exercising (100) stands on the front legs (11) and on the rear legs (12), and the rear position, in which the means of exercising (100) stands on the rear legs (12) and the auxiliary legs (13), arranged behind the rear legs (12) and the front legs (11) are raised above the mat (5), whereby the shoe (200) of the exerciser rests on the obstacle (6) with the front part (2011) of the sole (201) of the shoe (200), the leg being bent (200), and with the whole sole (201) of the shoe (200), including the rear part (2012) of the sole (201), while the leg is straightened.

2. The method of exercising according to claim 1, **characterized in that** the means of exercising (100) moves from the basic position by straightening the leg of the exercising person to the rear position, whereby in the basic position the means of exercising (100) stands on the front legs (11) and on the rear legs (12) and the bent leg of the exerciser leans against the obstacle (6) with the front part (2011) of the sole (201) of the shoe (200), in which the front part of the foot of the exercising person rests on the biomechanical insole (210), whereby the big toe joint engages the recess (211) for the big toe joint in the insole (210) and the distal phalanx together with the other distal phalanges rest on the insole (210), by stretching the exerciser's leg the means of exercising moves to the rear position, in which the means of exercising (100) stands on the rear legs (12) and the auxiliary legs (13) and the straightened leg of the exerciser leans against the obstacle (6) with the whole sole (201) of the shoe

(200), in which the foot rests on the biomechanical insole (210), whereby the big toe joint engages the recess (211) for the big toe joint and rests on the insole (210) in it and together with it also the joints of the other toes rest on the insole (210), as well as the heel, which abuts the depression (212) of the insole under the heel or the heel hole in the insole, whereby the instep of the foot during transition from one position to the other alternately presses on and releases the pressure from the instep portion of the upper of the shoe against the force of the elastic insertion/insertions (202) and the heel alternately presses on and releases the pressure from the elastic insertions (203) in the heel section of the shoe (200).

3. The means of exercising for strengthening muscles and keeping people in good shape and for performing the method of exercising according to claim 1 or 2 comprising at least two rear legs (12) or any support replacing these legs, and one or two front legs (11) or any support replacing this leg/these legs, on which is mounted a seat (2) and a backrest (3), **characterized in that** behind the rear legs (12) on the means of exercising (100) are formed auxiliary legs (13), whose ends in the position, in which the means of exercising (100) stands on the mat (5) on the front legs (11) and on the rear legs (12), are situated above the mat (5), whereby the plane interlaid by the ends of the rear legs (12) and the ends of the auxiliary legs (13) forms with the mat (5) an angle whose size is in the range from 10° to 40°, preferably from 20° to 30°.

4. The means of exercising according to claim 3, **characterized in that** the rear legs (12) are swingingly mounted on a hinge, which is mounted on a mat (5) adjustably with respect to the obstacle (6) with an option of fixing its position.

5. The means of exercising according to claim 4, **characterized in that** a part of the means of exercising (100) is a mat (5), consisting of two skids, on which the rear legs are pivoted by a pivot.

6. The means of exercising according to any of claims 3 to 5, **characterized in that** a support (7) for resting the exercising leg of the

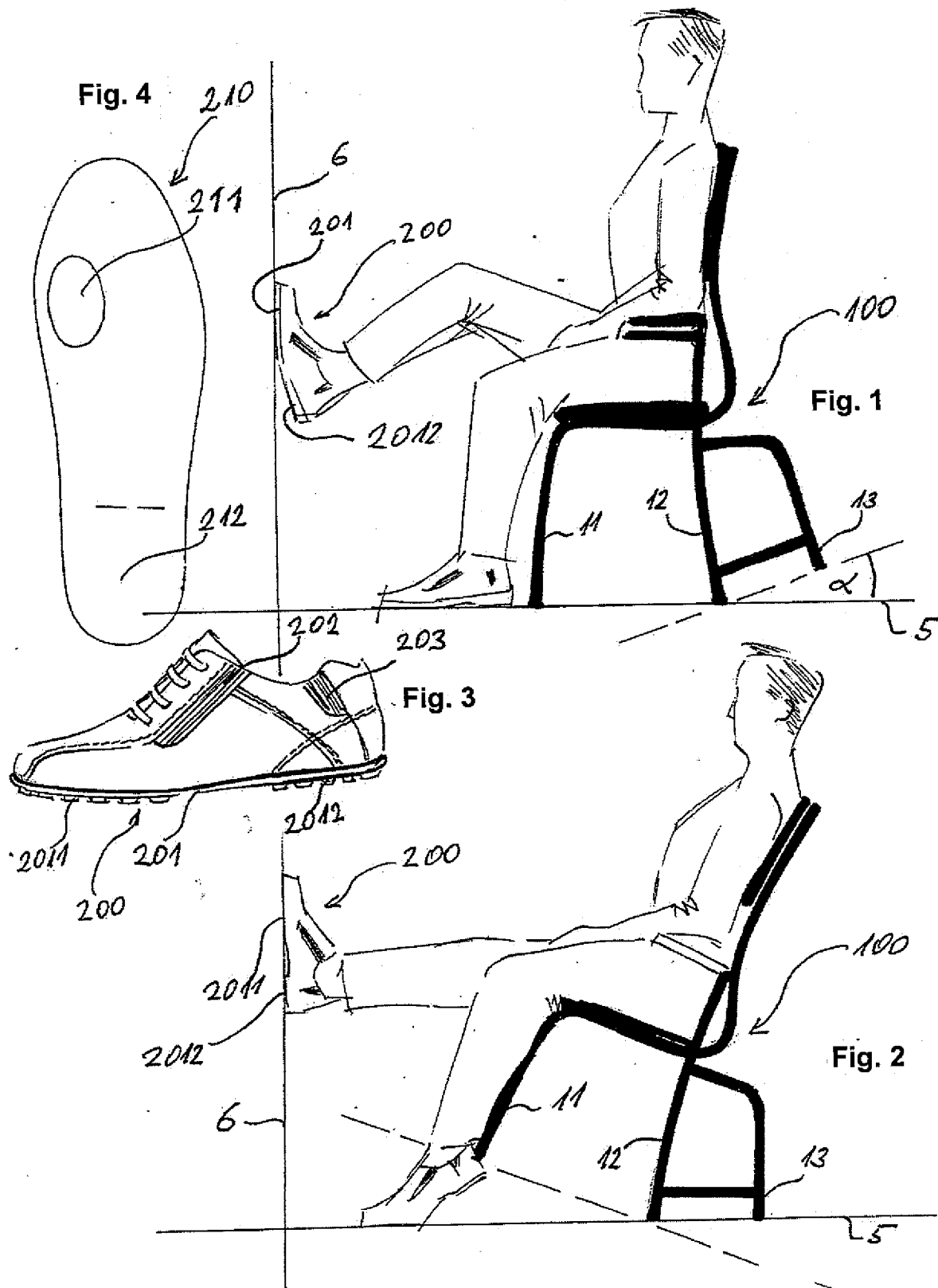
exercising person is located before the front part of the means of exercising (100).

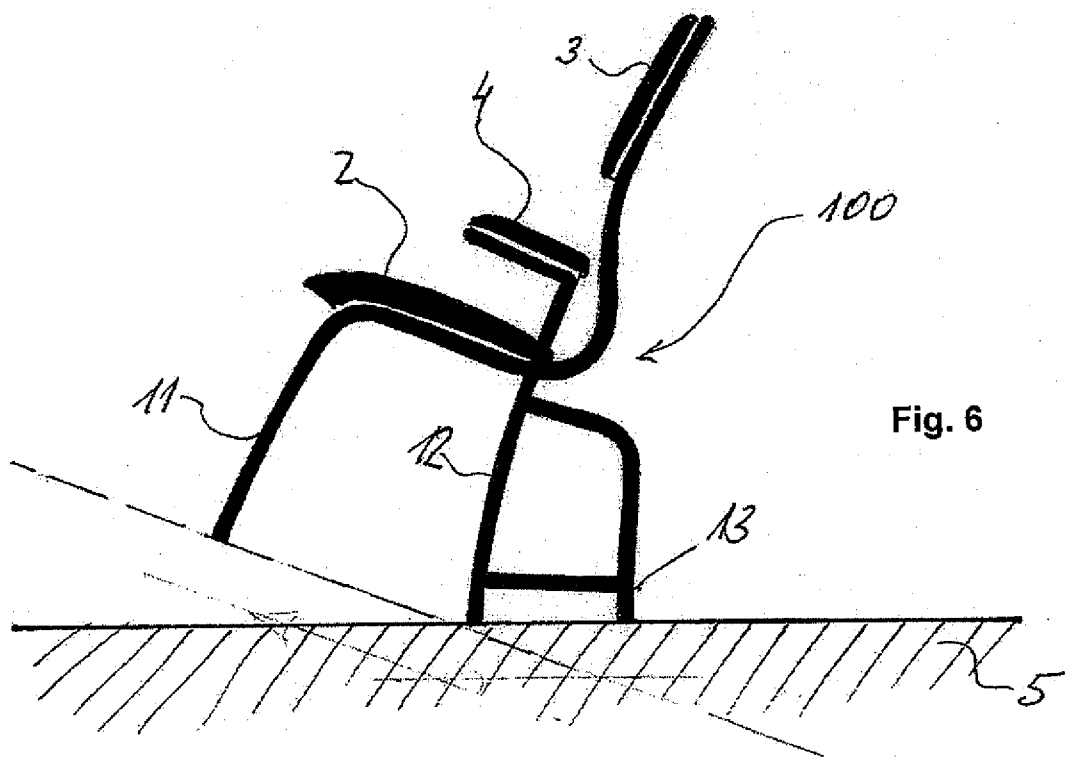
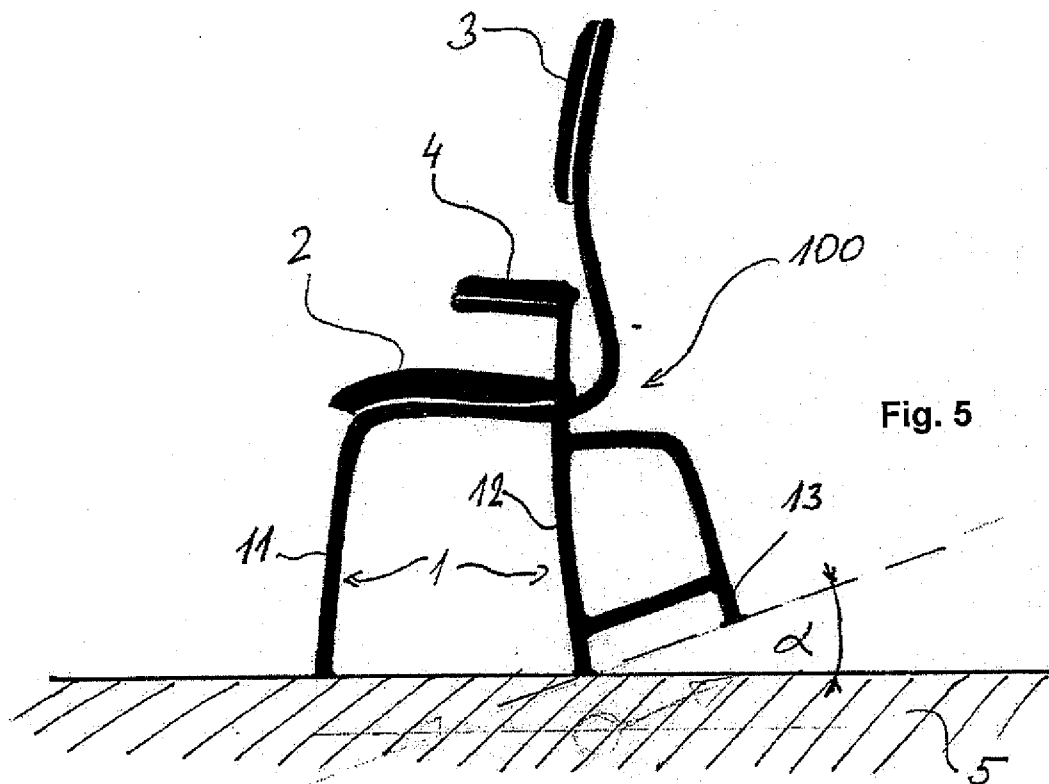
7. The means of exercising according to claim 6, **characterized in that** the support (7) of the exercising leg is a part of the means of exercising (100) and is coupled with a footrest (8) for the foot sole of the exercising leg, whereby
5 the distance between the means of exercising (100) and the backrest (8) is adjustable.

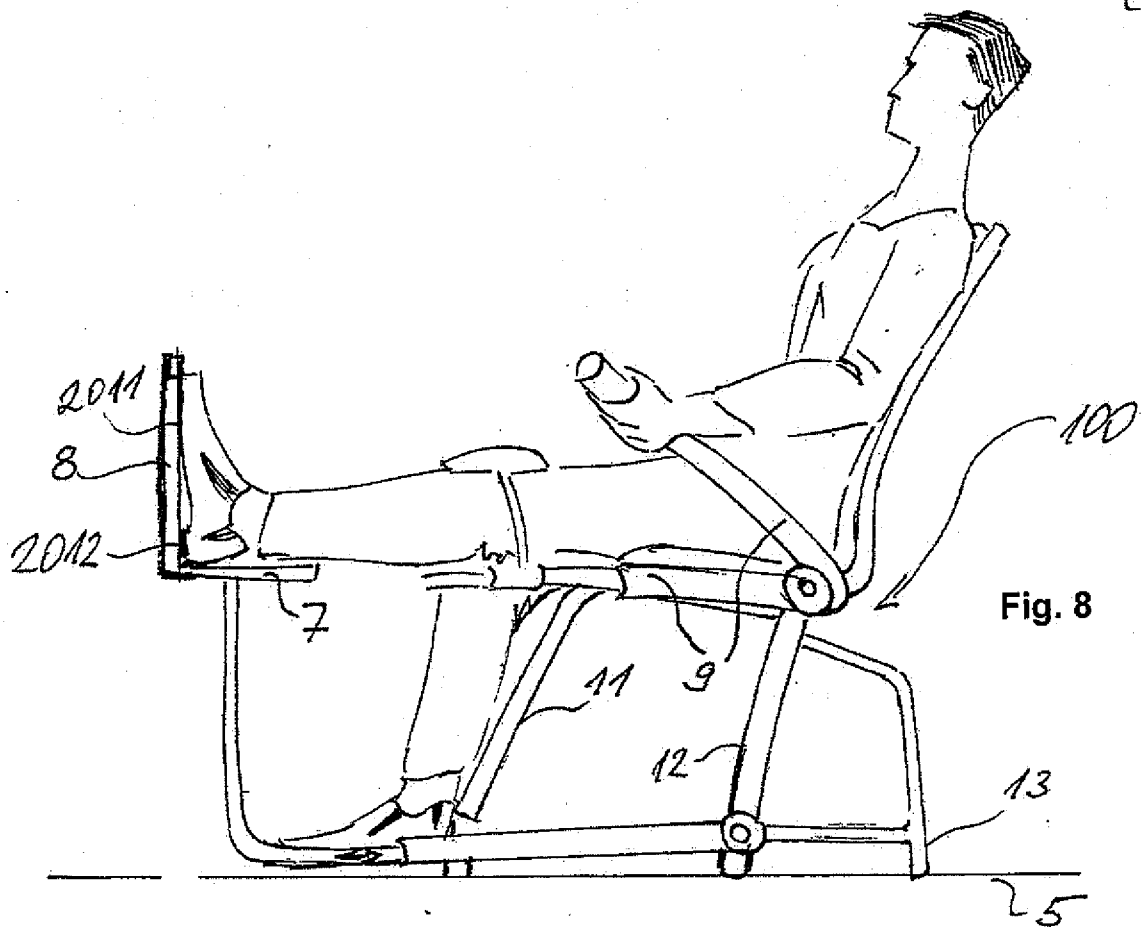
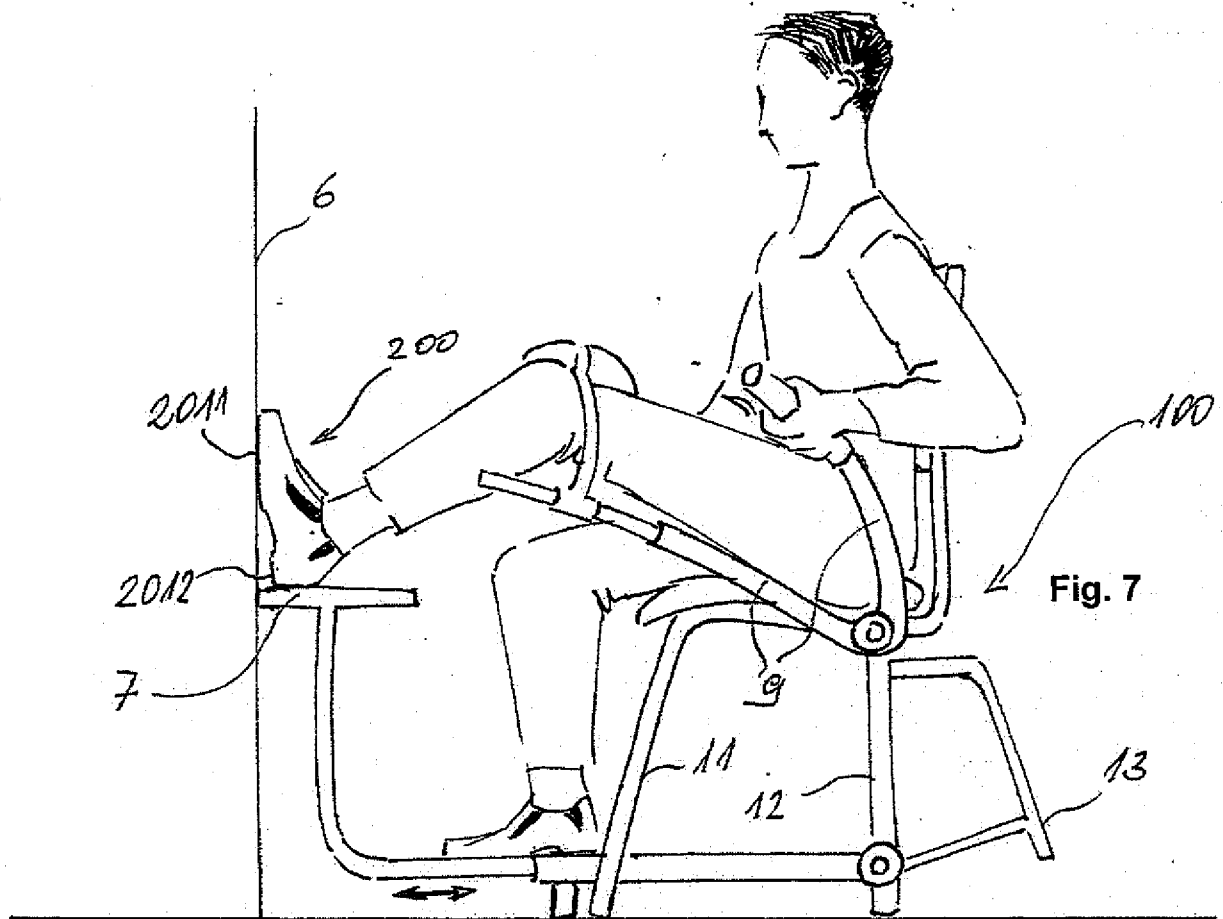
8. The means of exercising according to claim 6 or 7, **characterized in that** at least on one side of the means of exercising (100) is rotatably mounted
10 a lever (9) which can be coupled with the exerciser's leg for manual handling the exercising leg.

9. The means of exercising according to any of claims 3 to 8, **characterized in that** a compression spring is inserted between the auxiliary legs (13) and the mat (5).

15 10. The system of exercising for strengthening muscles and keeping people in good form, **characterized in that** it comprises a shoe (200) according to CZ PV 2012-132, which accommodates a biomechanical insole (210) according to CZ PV 2009-580 or CZ 298894 and the upper of the shoe (200) comprises at least one elastic insertion (202, 203), and the system also
20 comprises a means of exercising (100).







INTERNATIONAL SEARCH REPORT

International application No
PCT/CZ2015/000139

A. CLASSIFICATION OF SUBJECT MATTER		
INV.	A63B23/04 A43B7/14 A43B7/30 A43B13/40 A43B17/00	
	A43B17/03 A43C11/02 A61H1/02 A63B23/10	
ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
A63B A43B A43C A61H		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	WO 2011/135278 A1 (MARRIOTTS BUSINESS SERVICES LTD [GB]; HALLETT BRIAN RICHARD [GB]) 3 November 2011 (2011-11-03) page 5, line 13 - page 7, line 16; figures 1-5	1,2,10
Y	US 4 756 096 A (MEYER GRANT C [US]) 12 July 1988 (1988-07-12) column 5, line 4 - column 11, line 43; figures 1-22	1,2,10
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
2 March 2016		10/03/2016
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Jekabsons, Armands

INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 6 640 465 B1 (BURGESS MARJORIE S [US]) 4 November 2003 (2003-11-04) column 2, line 29 - column 5, line 9; figures 1-9 -----	1,2,10
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