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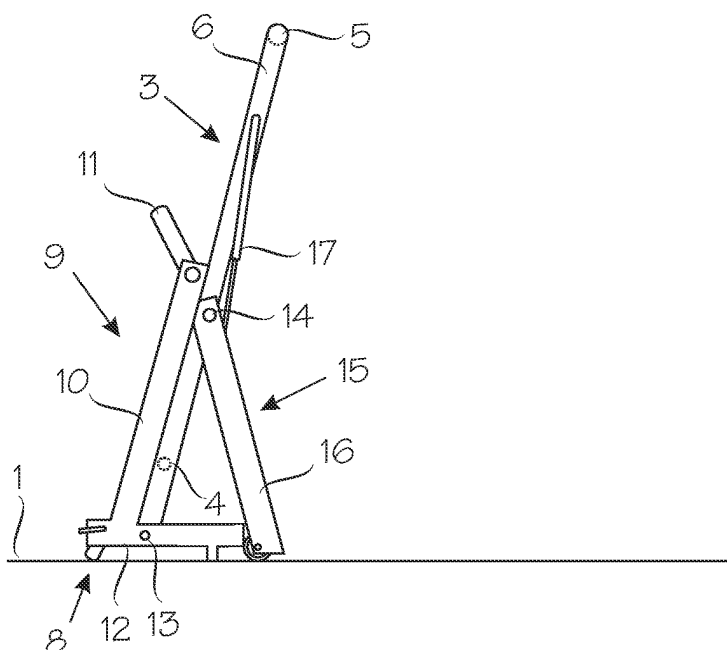
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(54) **Treadmill**

(57) The invention relates to a treadmill that comprises a frame (2), a belt section (3) arranged on the frame and comprising a belt (6) arranged in an endless loop around two rolls (4,5) at a distance from each other, and a hand support structure (9) extending upward from the plane of the frame in the operating position of the treadmill and comprising a support part (10) on both

sides of the frame. An auxiliary frame (15) that turns around a transverse shaft (14) is fastened to the frame (2), and arms (16) of the auxiliary frame extend parallel to the frame towards one end of the frame so that when the frame (2) is lifted up, the auxiliary frame (15) turns around the shaft (14) and the ends of the arms (16) rest against the floor and form points of supports to keep the frame (2) in the upright position.

Fig. 2



Description

[0001] The invention relates to a treadmill that comprises a frame, a belt section arranged on the frame and comprising a belt arranged in an endless loop around two rolls at a distance from each other, first means for turning the belt around a front roll and a back roll at a desired speed, and second means for adjusting the tilt of the belt section with respect to the horizontal, and a hand support structure extending upward from the plane of the frame in the operating position of the treadmill and comprising a support part on both sides of the frame, whereby the frame is arranged to be an element turnable in the upright position.

[0002] Treadmills are today very popular devices, and they are used for instance at gyms and at home for exercises related both to keeping fit and to top athletics. Treadmills provide the advantage that they make it possible to do running exercises indoors, whereby the user is independent of weather conditions and large hall space. In addition, the advantage of treadmills when used for keeping fit is that they make it possible to combine exercises with some other activity, such as watching television, which in a way allows for more time for the fitness exercise, because it can be combined with some other activity, such as watching a television programme.

[0003] During home use in particular, it has been noticed that the space required by a treadmill is relatively large in comparison with the available space, so the possibility to turn the treadmill upright, into what is known as the storage and/or transport position when the device is not used, is in practice an important feature. The above-mentioned matters are also important in gym use, because treadmills intended for professional use can be very big. Another advantage is that the total weight of the device is reasonable so as to make moving it simple.

[0004] During the years, a variety of treadmills have been manufactured starting from simple basic devices to very versatile devices intended for testing purposes. Examples of known treadmill solutions are devices described in published US patents 5,855,537; 8,899,834; 5,921,893; 6,273,843; 6,325,745; 6,461,275; and 6,475,121, and in published US application 2002/0183169.

[0005] In known devices, the mechanisms permitting the lifting of the frame into an upright position have been relatively complex solutions. The solutions use different levers, joints, moving points of support in guide elements, and other such details. Due to the complex structure, the need for maintenance of these devices is relatively great. A complex structure also requires a correct attitude from a user; in other words, a solution designed for expert use is not in all cases suitable for an average enthusiast, and on the other hand, a complex structure that is, however, structurally weak, will not endure the rough use sometimes occurring in a gym. The complex

structure has also increased the manufacturing costs and increased the weight of the device, which has made moving the device more difficult.

[0006] It is an object of the invention to provide a treadmill, by means of which the drawbacks of the prior art can be eliminated. The treadmill of the invention achieves this.

[0007] The treadmill of the invention is characterized in that an auxiliary frame that turns around a transverse shaft is fastened to the frame, and arms of the auxiliary frame extend parallel to the frame towards one end of the frame so that when the frame is lifted up, the auxiliary frame turns around the transverse shaft and the ends of the arms rest against the floor and form points of support that keep the frame upright. The invention can also be implemented in such a manner that two auxiliary frames are used in the structure, whereby support parts of the hand support structure are fastened at their bottom ends to the first auxiliary frame and the frame is fastened in the area of one end to the first auxiliary frame so that it turns around a first transverse shaft, whereby the invention is characterized in that a second auxiliary frame that turns around a second transverse shaft is fastened to the frame, and arms of the second auxiliary frame extend parallel to the frame towards one end of the frame so that when the frame is lifted up around the first transverse shaft, the second auxiliary frame turns around the second transverse shaft and the ends of the arms rest against the floor and form points of support that keep the frame upright.

[0008] The invention provides above all the advantage that by means of the invention, it is possible to provide a simple and functional structure. Due to the simple structure, the maintenance need of the treadmill is small, whereby the operating costs of the device are low. As a result of the simple structure, the weight of the device does not become unreasonable, and the handling and moving of the device is easy. Turning the treadmill of the invention upright, i.e. to the transport and/or storage position, is a light operation. Yet, the hand support structure of the treadmill of the invention is very strong. The mechanics of the treadmill of the invention are simple. The invention provides the further advantage that its structure enables the delivery of the device fully assembled and the customer need not assemble it before using it.

[0009] In the following, the invention will be described in greater detail by means of embodiments of the invention shown in the attached drawing, in which

Figure 1 is a side view of a treadmill of a first embodiment of the invention in its operating position, and

Figure 2 is a side view of the treadmill of Figure 1 in a situation, in which the frame is turned upright, Figure 3 shows a treadmill of a second embodiment of the invention in its operating position, Figure 4 shows the treadmill of Figure 3 in a situa-

tion, in which the frame is turned upright, Figure 5 shows a situation, in which a treadmill turned upright as shown in Figure 4 is movable sideways, Figure 6 shows a situation, in which the treadmill of Figure 3 is turned into a low storage position, and Figure 7 shows a situation, in which the position of Figure 6 is made even lower.

[0010] Figure 1 shows the treadmill of the invention in its operating position, i.e. running position. The treadmill is arranged to rest against the floor 1. The term 'floor' refers herein to any support surface on which the treadmill rests. Reference number 2 marks the frame. A belt section 3 is arranged on the frame 2 and comprises a belt 6 arranged in an endless loop around two rolls 4, 5 at a distance from each other, the belt forming a plane on which the user of the device runs.

[0011] The treadmill further comprises first means 7 for turning the belt 6 around a front roll and a back roll at a desired speed, and second means 8 for adjusting the tilt of the belt section with respect to the horizontal. The first means 7 comprise for instance an electric motor and an appropriate power transmission mechanism. The second means 8 can, in some applications, comprise a suitable power source and a power transmission mechanism, such as an electric motor and rack transmission, or another suitable solution. The second means 8 also comprise floor supports resting against the floor. The adjustment of the tilt can preferably take place by adjusting the floor supports. The adjustment can be motor-operated or manual.

[0012] The treadmill further comprises a hand support structure 9 extending upward from the plane of the frame 2 in the operating position, and the hand support structure comprises a support part 10 on both sides of the frame. The hand support structure can also comprise a control and/or gauge panel 11 of the device. The size and shape of the control and/or gauge panel depends for instance on the adjustment options and other functions of the device.

[0013] Both support parts 10 of the hand support structure 9 are joined at their bottom ends to a first auxiliary frame 12. The frame 2 is in the area of its first end fastened to the first auxiliary frame 12 so that it turns around a first transverse shaft 13.

[0014] The above-mentioned facts are entirely conventional technology to a person skilled in the art, so they are not described in more detail herein. In terms of these facts, reference is made to the above-mentioned US publications, for instance.

[0015] An essential factor of the treadmill of the invention is that a second auxiliary frame 15 that turns around a second transverse shaft 14 is fastened to the frame 2. Arms 16 of the second auxiliary frame 15 extend parallel to the frame 2 towards one end of the frame. The above-mentioned detail is clearly shown in Figure 1.

[0016] The second auxiliary frame 15 is fastened to

the frame 2 so that when the frame 2 is lifted up around the first transverse shaft 13, the second auxiliary frame 15 turns around the second transverse shaft 14, whereby the ends of the arms 16 rest against the floor 1 and for points of support to keep the frame 2 in the upright position. The above-mentioned operating principle is especially clearly shown in Figure 2.

[0017] The second transverse shaft 14 can be located at any suitable point of the frame 2. To locate the second transverse shaft 14 at substantially the middle of the frame, as done in the example of the figures, has been found especially advantageous.

[0018] At least one element 17 easing the turning movement can preferably be arranged between the frame 2 and the second auxiliary frame. The element 17 can be a gas spring, for instance. The idea of the gas spring is that when the back part of the frame is lifted up from the floor, the gas spring lightens the lifting by pushing downward the second auxiliary frame pivoted to the frame so that when the lifting is continued, the situation shown in Figure 2 is achieved. Support wheels 18 rotating around substantially horizontal shafts can preferably also be arranged in the area of the ends of the arms 16 to facilitate the moving of the treadmill.

[0019] Figures 3 to 7 show a second embodiment of the treadmill of the invention. The same reference numbers are used for similar parts in Figures 3 to 7 as in Figures 1 and 2.

[0020] The embodiment of Figures 3 to 7 only uses one auxiliary frame so that in the embodiment of Figures 3 to 7, the auxiliary frame 15 corresponds to the second auxiliary frame 15 of the embodiment shown in Figures 1 and 2. Correspondingly, the transverse shaft 14 of the embodiment shown in Figures 3 to 7 corresponds to the second transverse shaft of the embodiment in Figures 1 and 2.

[0021] As stated above, the embodiment of Figures 3 to 7 does not have an auxiliary frame in the front part of the frame 2, but the front part of the frame rests directly against the floor. The treadmill of Figures 3 to 7 is turned into the upright position in a similar manner as described earlier in connection with Figures 1 and 2. The frame is for instance lifted up from its back end, whereby the auxiliary frame 15 turns around the transverse shaft 14 and the ends of the arms 16 rest against the floor and form points of support to keep the frame in the upright position. In the embodiment of Figures 3 to 7, the hand support structure is arranged turnably to the frame 2, whereby a relative turning movement is obtained between the frame and the hand support structure 9, as shown in Figures 5 and 7, for instance. The turning movement can, if necessary, be lightened by means of the element 17 easing the turning movement, for instance a gas spring, that is arranged between the frame 2 and the auxiliary frame 15.

[0022] Figures 6 and 7 show an additional advantage achieved by the invention. The device of the invention can be put into a low storage position, in which case the

device easily fits into a low storage space. The treadmill of the invention can be put into the above-mentioned low storage space by turning the hand support structure substantially parallel to the frame, as shown in Figure 6. The structure can be made even lower by also making the control and/or gauge panel 11 into a turnable part, whereby said part can be further turned substantially parallel to the frame, as shown in Figure 7.

[0023] The embodiment of Figures 3 to 7 can be equipped with different support wheels depending on how the device shall be moved. In the figures, reference number 18 marks support wheels rotating around substantially horizontal shafts to facilitate the moving of the points of support when the device is lifted. In the figures, reference numbers 19 and 20 mark wheels that enable the moving of the device sideways. The wheels can be made movable, like the wheels 20 in Figures 3 to 7 that can be lowered when the device needs to be moved sideways. Such a situation is shown in Figures 4 and 5. Movability can be achieved by means of a simple shaft moving in a link or by another suitable mechanism. The wheels 19 and 20 can also be applied to the embodiment of Figures 1 and 2.

[0024] The embodiment described above is not in any way intended to restrict the invention, and the invention can be modified freely within the scope of the claims. Thus, it is clear that the treadmill of the invention or its details need not be exactly as described in the figures, and solutions of other type are also possible. For instance, in the example of the figures, the structure is implemented such that the first and second auxiliary frames support the frame so that the frame does not have any points of support to the floor. However, this is not the only solution, and points of support to the floor can also be formed to the frame, if necessary. All applications of the treadmill of the invention can be equipped with various other support wheels so that the treadmill can also be moved in the transverse direction, for instance, as earlier stated. The support wheels can be not only fixed, but also movable solutions, whereby they can be lowered down for the move and, correspondingly, raised up when the treadmill is to remain in place. The above-mentioned wheels can naturally also be made turnable around a vertical shaft and lockable to a desired position, and they can be equipped with a brake mechanism to ensure that the device remains in place. The treadmill of the invention can naturally also be equipped with means for locking the frame in both the running and upright position, etc. Any means known per se can be used as the above locking means, for instance pin locking means, latch means, or the like. In the example of the figures, the first and second means, which rotate the belt and adjust the tilt angle of the frame, are located in the front part of the frame, and the frame is lifted upright by lifting it up from the back end. However, this is not the only option, and the structure can also be implemented in other ways; for instance, the first and second means can also be placed in the back part of the frame,

whereby the lighter front end of the frame is preferably lifted up when the frame is raised to the upright position.

5 Claims

1. A treadmill that comprises a frame (2), a belt section (3) arranged on the frame and comprising a belt (6) arranged in an endless loop around two rolls (4, 5) at a distance from each other, first means (7) for turning the belt around a front roll and a back roll at a desired speed, and second means (8) for adjusting the tilt of the belt section (3) with respect to the horizontal, and a hand support structure (9) extending upward from the plane of the frame in the operating position of the treadmill and comprising a support part (10) on both sides of the frame, whereby the frame (2) is arranged to be an element turnable in the upright position, **characterized in that** an auxiliary frame (15) that turns around a transverse shaft (14) is fastened to the frame (2), and arms (16) of the auxiliary frame extend parallel to the frame towards one end of the frame so that when the frame (2) is lifted up, the auxiliary frame (15) turns around the transverse shaft (14) and the ends of the arms (16) rest against the floor and form points of support that keep the frame (2) upright.
2. A treadmill as claimed in claim 1, **characterized in that** the transverse shaft (14) is arranged at substantially the middle of the frame (2).
3. A treadmill as claimed in claim 1 or 2, **characterized in that** at least one element (17) easing the turning movement is arranged between the frame (2) and auxiliary frame (15).
4. A treadmill as claimed in claim 1, **characterized in that** in the area of the ends of the arms (16), support wheels (18) are arranged that rotate around substantially horizontal shafts.
5. A treadmill as claimed in any one of the preceding claims 1 to 3, **characterized in that** the hand support structure (9) is arranged turnably to the frame (2).
6. A treadmill that comprises a frame (2), a belt section (3) arranged on the frame and comprising a belt (6) arranged in an endless loop around two rolls (4, 5) at a distance from each other, first means (7) for turning the belt around a front roll and a back roll at a desired speed, and second means (8) for adjusting the tilt of the belt section (3) with respect to the horizontal, and a hand support structure (9) extending upward from the plane of the frame in the operating position of the treadmill and comprising a support part (10) on both sides of the frame, both sup-

port parts being joined at their bottom ends to a first auxiliary frame (12), whereby the frame (2) is fastened in the area of its first end to the first auxiliary frame (12) so that it turns around a first transverse shaft (13), **characterized in that** a second auxiliary frame (15) that turns around a second transverse shaft (14) is fastened to the frame (2), and arms (16) of the second auxiliary frame extend parallel to the frame towards one end of the frame so that when the frame (2) is lifted up around the first transverse shaft (13), the second auxiliary frame (15) turns around the second transverse shaft (14) and the ends of the arms (16) rest against the floor and form points of support that keep the frame (2) upright.

7. A treadmill as claimed in claim 6, **characterized in that** the second transverse shaft (14) is arranged at substantially the middle of the frame (2).
8. A treadmill as claimed in claim 6 or 7, **characterized in that** at least one element (17) easing the turning movement is arranged between the frame (2) and the second auxiliary frame (15).
9. A treadmill as claimed in claim 6, **characterized in that** support wheels (18) rotating around substantially horizontal shafts are arranged in the area of the ends of the arms (16).

Fig. 1

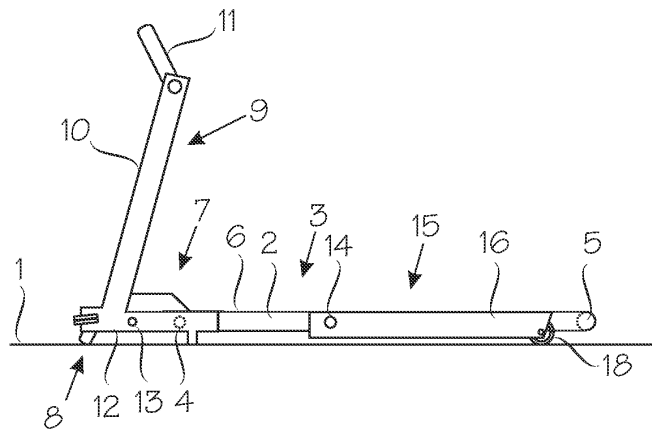


Fig. 2

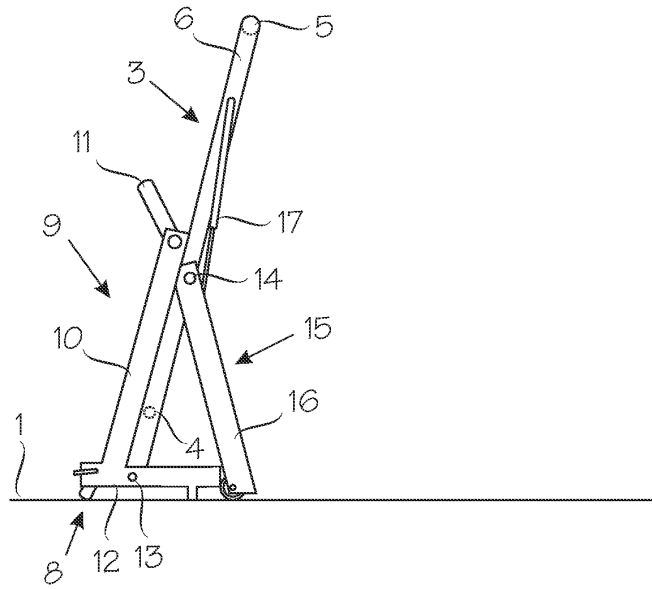


Fig. 3

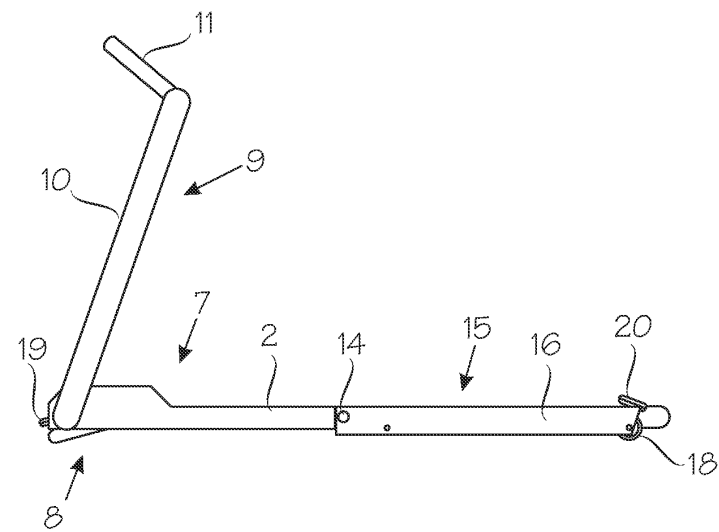


Fig. 4

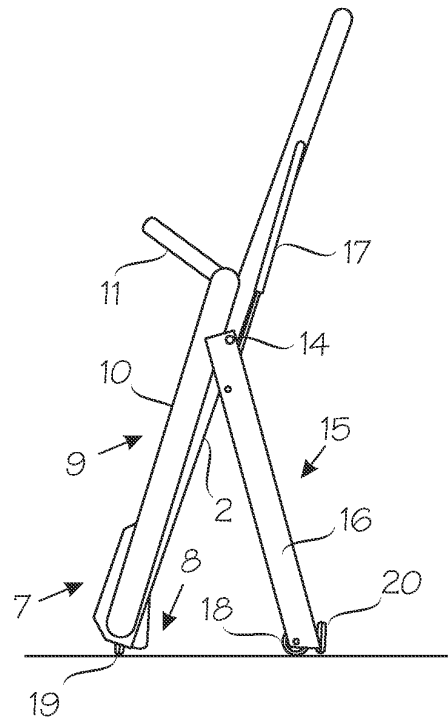


Fig. 5

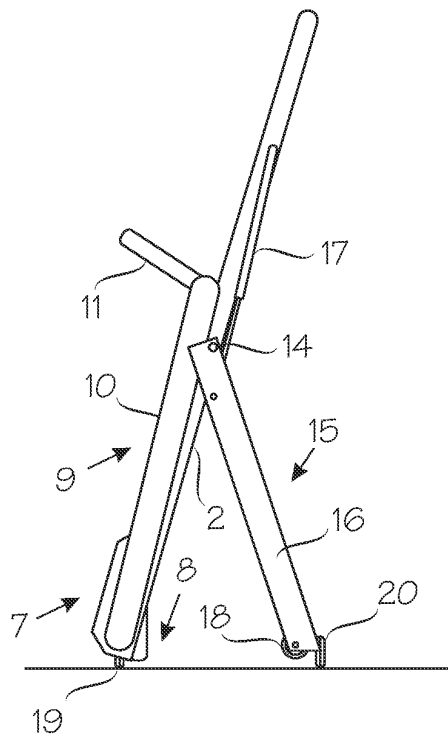


Fig. 6

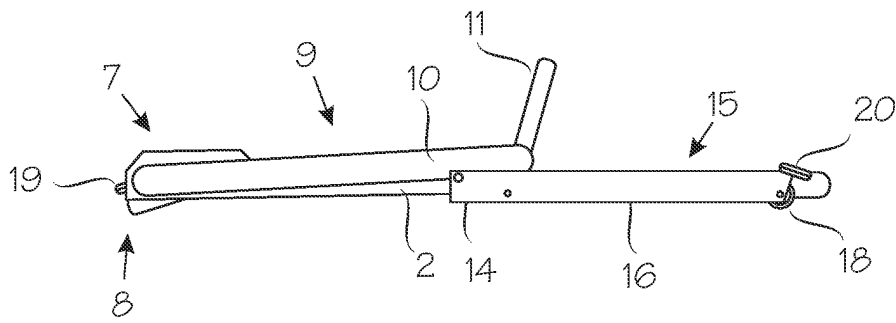
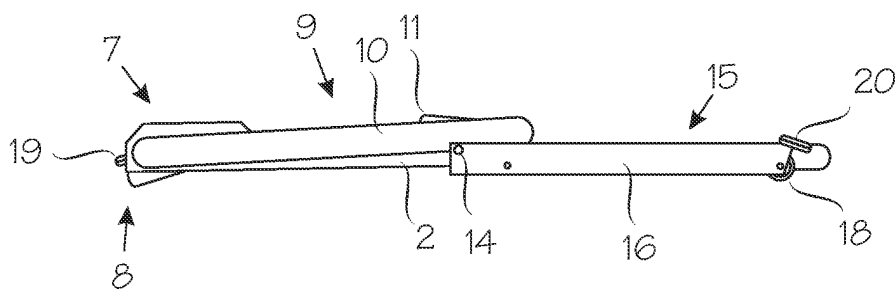


Fig. 7





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 10 2011

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 2003/060334 A1 (LIAO PENDY ET AL) 27 March 2003 (2003-03-27)	1,3-5	A63B22/02 A63B22/00
Y	* paragraph [0029] - paragraph [0035]; figures 3-8 *	6,8,9	
Y	US 6 325 745 B1 (YU JESSICA) 4 December 2001 (2001-12-04) * column 2, line 34 - line 58; figure 1 *	6,8,9	
X,P	US 2004/023758 A1 (CHANG DICK) 5 February 2004 (2004-02-05) * paragraph [0014] - paragraph [0018]; figures 1-6 *	1,4,6,9	
A	US 6 273 843 B1 (LO PETER K C) 14 August 2001 (2001-08-14) * abstract; figures 2-8 *	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A63B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 23 August 2004	Examiner Jekabsons, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 10 2011

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-08-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003060334 A1	27-03-2003	NONE	
US 6325745 B1	04-12-2001	TW 422111 Y	11-02-2001
US 2004023758 A1	05-02-2004	NONE	
US 6273843 B1	14-08-2001	NONE	

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