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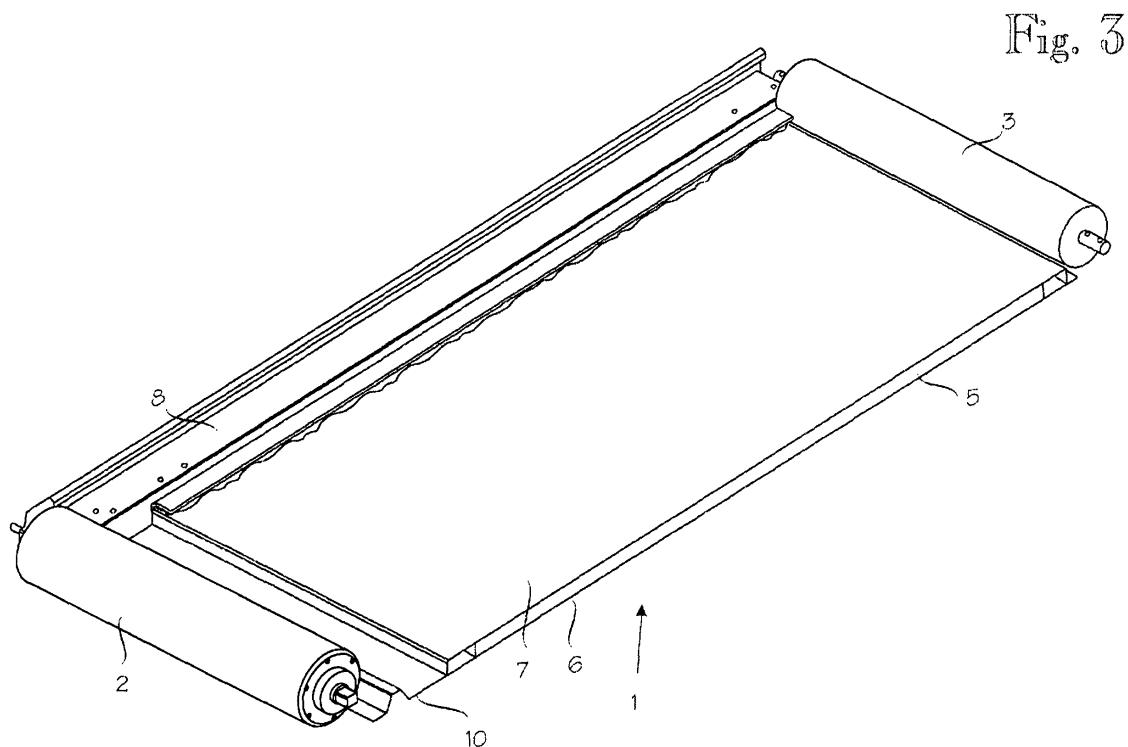
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(54) **Treadmill**

(57) The invention relates to a treadmill comprising a frame structure (1) as well as roller parts (2, 3) supported against the frame structure, a belt part (4), and means for rotating at least one of the roller parts, whereby the

belt part (4) is arranged to rotate as an endless loop around the roller parts. The frame structure (1) is made of a self-supporting structure functioning as a tread base and formed as an integrated glued structure.



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Description

[0001] The invention relates to a treadmill comprising a frame structure as well as roller parts supported against the frame structure, a belt part, and means for rotating at least one of the roller parts, whereby the belt part is arranged to rotate as an endless loop around the roller parts.

[0002] Treadmills are very popular devices today, being used for instance at gyms and at home for training within both keep-fit activities and world-class sports. An advantage of treadmills is that running exercises can be done indoors, whereby one is not dependent on weather conditions or large halls. Further, in keep-fit activities, an advantage of treadmills is the possibility to combine the exercises with some other activity, for example watching TV.

[0003] Over the years, various types of treadmills have been manufactured, from simple basic devices to diversified devices intended for test use. Devices disclosed in US patents 5 855 537, 5 899 834, 5 921 893, 6 273 843, 6 325 745, 6 461 275 and 6 475 121 as well as in US application publication 2002/0183169 can be mentioned as examples of known treadmill solutions.

[0004] In known solutions, the structure comprises a tread base that is attached to the load-bearing metal frame of the treadmill with either rigid or elastic bolt or screw joints, for instance with rubber bushings or steel springs.

[0005] A disadvantage of prior art solutions has been a complex and often large-size structure. The complexity also means a large number of components, which increases the costs related to acquiring, storing and assembling the components. Also, the weight of the devices according to known solutions is often considerably high, which makes the moving of the device more difficult. Corresponding problems are also caused by the large size of the device; for instance, a high-positioned tread surface is not regarded as user-friendly. In some cases, the weight and large size of the construction also cause problems when the device is to be transported to the customer.

[0006] An object of the invention is to provide a treadmill by means of which disadvantages of prior art can be eliminated. This has been achieved with the solution of the invention. The treadmill according to the invention is characterized in that the frame structure is made of a self-supporting structure functioning as a tread base and formed as an integrated glued structure.

[0007] An advantage of the invention is that the number of components in the structure is essentially smaller than in prior art solutions, whereby the costs are reduced in this respect, compared with prior art solutions. The treadmill according to the invention is also significantly lighter than a conventional one, because the elements used in the integrated glued structure, such as honeycomb plates and aluminium profiles, may be very light. The invention also enables an extremely low struc-

ture in which the tread surface is close to the floor surface. Such a feature is considered very advantageous today. Owing to the small number of components of the treadmill according to the invention, assembling the treadmill is quicker than with conventional treadmills. Yet another advantage is that the invention can utilize materials, such as aluminium, that do not require pre-treatment or surface treatment, as did the steel structures of prior art solutions. Owing to its lightness and small size, the treadmill of the invention is also easily moveable and can be packed and stored as a small-size unit, which is advantageous with regard to the production, logistic chain and user's training premises.

[0008] The invention will now be described in greater detail with reference to the example illustrated by the attached drawing, of which

Figure 1 shows a principled side view of a treadmill structure according to the invention;

Figure 2 shows a structure according to Figure 1, seen in direction A; and

Figure 3 shows a perspective view of the structure according to Figures 1 and 2.

[0009] The figures show the treadmill according to the invention as a principled manner. Reference numeral 1 indicates the frame structure of the treadmill, while reference numerals 2 and 3 designate roller parts arranged to be supported against the frame structure. Reference numeral 4 indicates a belt part arranged to rotate as an endless loop around the roller parts 2, 3. The above aspects represent completely conventional technology known to a person skilled in the art, and therefore they are not described in more detail here.

[0010] The treadmill further comprises means for rotating at least one roller part. In the example of the figures, the above means comprise a roller motor, but it is clear that they may also comprise a separate motor unit, gear means etc. The treadmill further comprises a handle part, which is provided with means for controlling the use of the treadmill. Further, the treadmill may be provided with means for adjusting the angle of inclination of the treadmill, etc. Also these aspects represent completely conventional technology known to a person skilled in the art, so that they are not described in more detail here. In this context, reference is made to the above-mentioned publications relating to prior art.

[0011] In accordance with an essential idea of the invention, the frame structure 1 of the treadmill is comprised of a self-supporting structure 5 formed as an integrated glued structure functioning as a tread base. As seen from the figures, the integrated glued structure constitutes the load-bearing lower part and the tread base; in other words it thus replaces a separate tread base, a separate frame structure, different support structures, dampers and all mechanical connecting peaces, such as screws, bolts, plates and the like elements used in known treadmills.

[0012] The structural solution according to the invention has essentially fewer components than conventional treadmill solutions, in which the base is formed by, for example, a tread base plate damped by rubber bushings, and a steel frame structure below it.

[0013] The invention thus comprises a self-supporting structure 5 which functions as a tread base and may be formed of a light and torsionally stiff plate. A honeycomb plate, for instance, can be used as such a plate, the raw material of the honeycomb cells being for instance aluminium or plastic. The thickness of the plate may be 20 to 30 mm, but also thinner or thicker plates are feasible as far as the total strength of the plate is guaranteed. The upper and lower surfaces of the plate cell can be provided, by gluing, with thin surface plate parts 6, 7 that give the structure the actual stiffness. The plate part 6 of the upper surface must be of a material with low friction and very good abrasion resistance, because the belt part 4 is, during use, against the plate part 6 and rubbing against it the whole time. The above-mentioned plate parts may be relatively thin, for instance 0.5 to 2 mm. The plate part 6 of the upper surface must endure enough point-like loading that may be generated in some cases, for instance sharp shoe heels. The plate part 7 of the lower surface does not have the same kind of requirements for abrasion resistance and endurance of point loading as the plate part 6 of the upper surface.

[0014] Profile parts 8 may be glued to the side edges of the honeycomb plate. The profile parts 8 are not essential for the invention, because the honeycomb plate gives, as such, sufficient stiffness and load-bearing capacity to the structure. Profile parts can be, however, easily utilized for attaching different components, and thus the appearance of the treadmill can be affected very advantageously. In the examples of the figures, the gluing between the profile part 8 and the honeycomb plate is implemented by means of a glue joint between the lower surface of the honeycomb plate and the profile part 8. The above aspect is clearly seen from Figure 3. It is to be noted that Figure 3 shows only the profile part 8 glued to one edge of the honeycomb plate. It is further to be noted that Figure 3 shows the structure according to the invention in the upside down position, whereas Figures 1 and 2 show the structure in the normal using position. The above gluing arrangement is not the only possible option, but also other kinds of gluing arrangements are naturally possible.

[0015] The profile parts 8 may be, for example, an extruded aluminium profile or steel. The profile parts 8 should have a sufficiently wide contact surface for the glue. The glue may be, for instance, tough and flexible urethane glue. The profile parts 8 also give fastening support to the front and rear roller parts 2, 3 in an advantageous manner.

[0016] The honeycomb plate together with the profile parts 8 can be dimensioned in such a way that they bear even very heavy loads, passing the static load test specified in the standard EN957-6.

[0017] The integrated structure according to the invention constitutes, as a whole, a stiff and hard tread base. Particularly those who run a lot prefer a hard running base to a loose and soft one. The flexibility and hardness of the base can be adjusted by the selection and dimensioning of the profile parts 8 and the honeycomb plate.

[0018] The front part of the honeycomb plate can be provided, for instance by means of a glue joint, with an auxiliary plate 10, to which different technical components can be attached, if required. The auxiliary plate 10 can naturally also be attached with another suitable fastening manner. Also various fastening solutions of a tread board 9, suitable for assembling industry, can be provided on top of the profile parts. Any fastening solutions known per se, for instance a snap/clamp joint, can be used. In fastening the tread board also a screw joint may be used, which has the advantage that a tread board that has been acquired as a spare part, for instance, is easy to be changed.

[0019] The above embodiment example of the invention is by means intended to restrict the invention, but the invention can be modified completely freely within the scope of the claims. The integrated self-supporting glued structure does not necessarily have to be manufactured of a honeycomb plate, but according to the basic idea of the invention it is fully possible to form the structure of the invention by using a conventional film-plywood plate and wood-fibre plate (MDF plate). When this embodiment is used, it should be made sure that the plate does not split in the middle, for instance. The invention can naturally be applied to very different treadmills; for instance the drive system of the belt part is by no way confined to the roller motor system shown by the figures, as was noted earlier.

Claims

1. A treadmill comprising a frame structure (1) as well as roller parts (2, 3) supported against the frame structure, a belt part (4), and means for rotating at least one of the roller parts, the belt part (4) being arranged to rotate as an endless loop around the roller parts, **characterized in that** the frame structure (1) is made of a self-supporting structure functioning as a tread base and formed as an integrated glued structure.
2. A treadmill according to claim 1, **characterized in that** the integrated glued structure comprises a honeycomb plate, surface plate parts (6, 7) being glued to the upper and lower surfaces of this plate.
3. A treadmill according to claim 2, **characterized in that** the surface plate part (6) glued to the upper surface of the honeycomb plate is made of low-friction and abrasion-resistant material.

4. A treadmill according to claim 1, **characterized in that** the integrated glued structure comprises a wood-fibre plate (MDF plate) and a film-plywood plate. 5
5. A treadmill according to any one of the preceding claims 1 to 4, **characterized in that** profile parts (8) are glued to the side edges of the glued structure. 10
6. A treadmill according to any one of the preceding claims 1 to 5, **characterized in that** an appropriate auxiliary plate (10) is arranged in the front part of the glued structure for attaching different technical components. 15
7. A treadmill according to claim 6, **characterized in that** the auxiliary plate (10) is attached to the glued structure with a glue joint. 20
8. A treadmill according to claim 5, **characterized in that** the profile parts (8) are components made of aluminium. 25

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Fig. 1

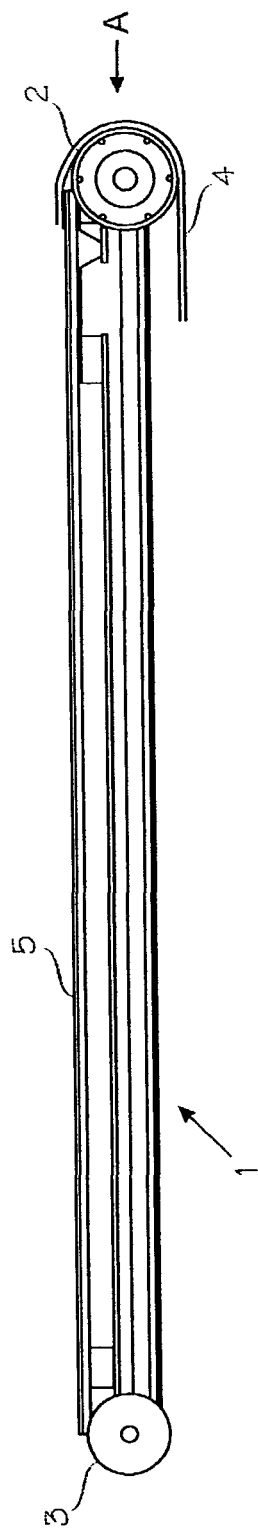


Fig. 2

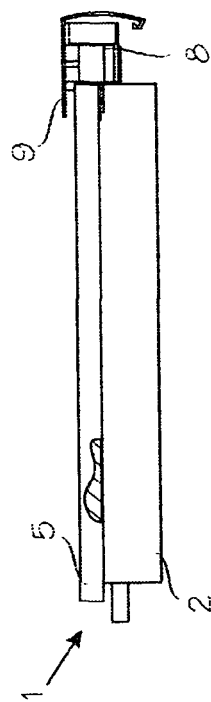
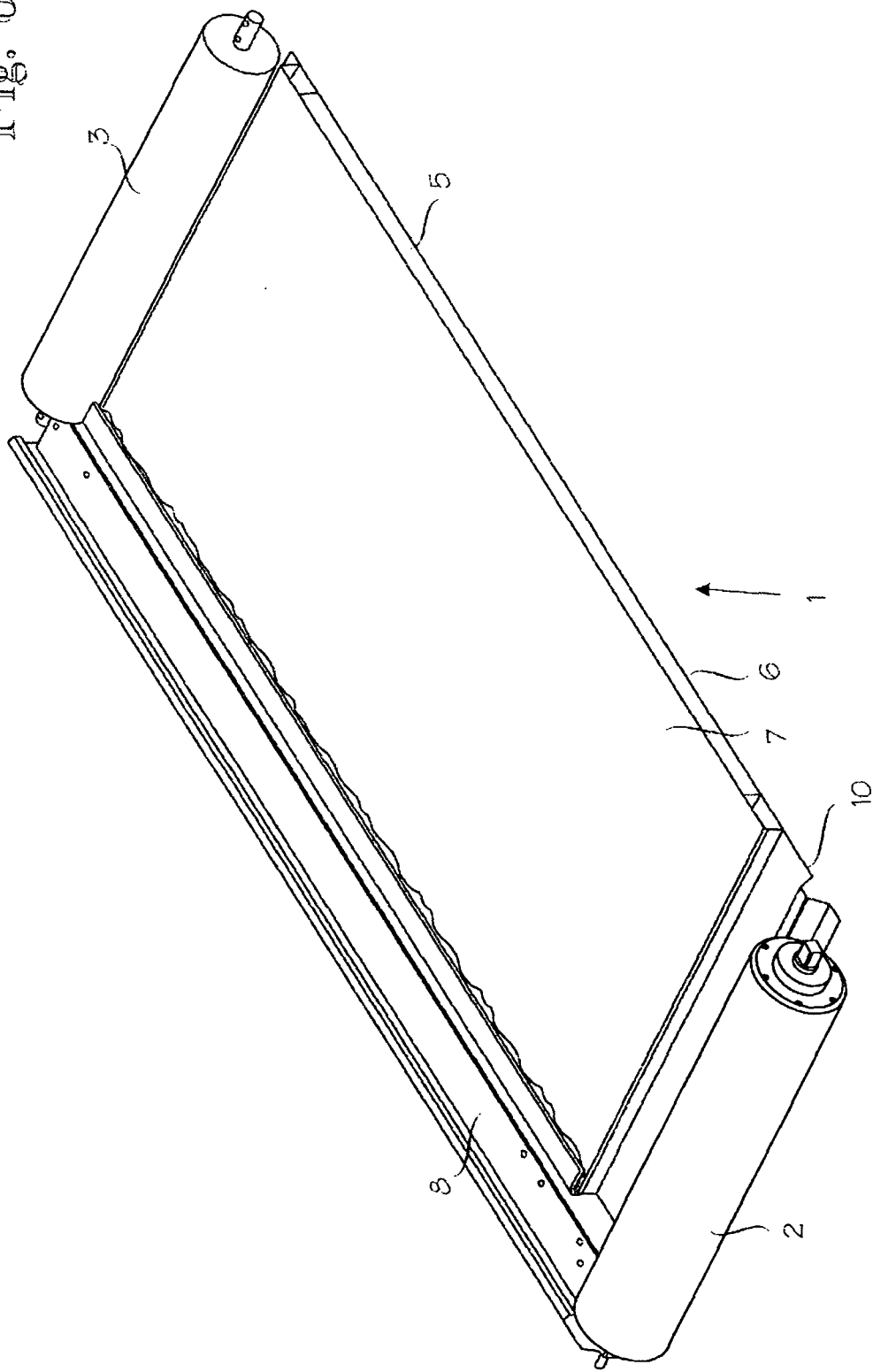


Fig. 3





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EUROPEAN SEARCH REPORT

Application Number
EP 05 10 7802

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		10 January 2006	Knoflachner, N
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 10 7802

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