The invention is a new cycling training device for application to bicycles (B) comprising a supporting element (S) with a seat for containing a hub (M) suitable for coupling with the rear fork (Bf) of a bicycle (B), a wheel (R) or flywheel with its sprocket (Rp) attached to said supporting element (S), parallel to said hub (M) and in a position opposite that of a bicycle (B) hooked onto said hub (M); the hub (M) is complete with a chain wheel (Dr) and a set of cogs (Dc) lying side by side and with decreasing diameters, suitable for coupling with the chain (Bc) of the bicycle (B) installed on said new device.
Description

[0001] The present patent relates to training equipment and devices, and particularly concerns a new cycling training device.

[0002] In many sporting disciplines, such as cycling, numerous training sessions are needed to achieve adequate levels of preparation.

[0003] Cycling is among the most popular sporting disciplines at all levels, for amateurs, as an occasional pastime, for cycling tourism and right up to various competitive levels.

[0004] It is not always possible to do cycle training on the road because:

- the roads are increasingly occupied by all kinds of traffic, including motorcycles, motorcars, and heavy goods vehicles that make it increasingly difficult for cyclists to use them;
- the roads are not always in ideal conditions and the surface may be damaged, with loose stones, holes and humps, that can make cyclists fall and place them at risk of injury;
- when the weather is fine, it is a pleasure to go cycling, but in the rain and other adverse weather conditions, or in the evenings, it is often very unpleasant and even hazardous to cycle on the roads;
- it becomes essential for cyclists to study and follow a route with the fewest possible road intersections to avoid them having to stop frequently and to enable them to maintain a constant speed.

[0005] For all these reasons, intensive cycling training is often done at indoor tracks and enclosed circuits.

[0006] Training at indoor tracks and circuits is expensive, however, and accessible only to a few athletes at one time. Moreover, such indoor tracks and circuits are in short supply and this means that athletes are obliged to travel more or less far and with more or less difficulty to and from the indoor track or circuit with their bicycles loaded on or in their cars.

[0007] There are known types of stationary cycling trainer for simulating a cycling action, which are without wheels and placed on a stand. These stationary trainers are ideal for exercising purposes, especially for the lower limbs, but they are hardly suitable for cycle training.

[0008] In fact, due to the reciprocal arrangement of the saddle, pedals and handlebar, stationary cycling trainers involve a riding position that is not like the position of a person riding a road or racing bicycle, and that is certainly different from the typical riding position on the bicycles used by athletes in races, be they amateurs or professionals.

[0009] Moreover, stationary cycling trainers have a gearing system that does not reproduce the mechanical features of a real bicycle or of any given bicycle subsequently used for racing.

[0010] To overcome all the above-mentioned drawbacks, a new cycle training device for use with a bicycle has been studied and carried out.

[0011] One object of the new trainer device is to enable cycle training indoors without having to gain access to installations with cycle tracks or circuits.

[0012] Another object of the new cycle trainer device is to enable training at home, irrespective of the weather conditions.

[0013] A further object of the new cycle trainer device is to enable training in conditions as similar as possible to those of a cycling race, or at least to those of training sessions on the road, because cyclists can ride their own racing bicycles.

[0014] Another object of the new device is to enable training with the cyclist's usual or preferred saddle-pedal-handlebar arrangement.

[0015] Another object of the new device is to enable cycle training with the opportunity to vary the gear ratio of the pedalling action.

[0016] These and other direct and complementary objects are achieved by the new cycle trainer device applicable to a bicycle, the main component parts of which comprise a folding supporting element, a hub with a set of cogs of decreasing diameter lying side by side, a wheel or flywheel with a sprocket, a chain or other connection element between a cog on the hub and the sprocket in the wheel or flywheel.

[0017] When opened, the supporting element acquires a shape suitable for supporting all said parts and for ensuring stability in the various directions.

[0018] Preferably, said supporting element consists of two uprights forming an inverted V-shaped stand with a hinge near or at the tip of said inverted V-shaped stand, and with two supporting feet attached to its lower ends.

[0019] The hinge between said uprights forming the inverted V-shaped stand is designed to enable the two uprights to come together in a generically parallel position, i.e. said hinge has an axis of rotation at right angles to the plane formed by said two uprights.

[0020] Said hub and cogs are supported on a suitable seat attached above said tip of the inverted V-shaped stand formed by the two uprights.

[0021] In particular, said seat and said hub are arranged so that said hub has an axis of rotation parallel to the axis of rotation of the hinge between said two uprights.

[0022] On one side of said hub there is a chain wheel of diameter similar to that of the toothed wheels of the pedals and a set of cogs of decreasing diameter lying side by side, like the set of cogs on the rear wheel of a bicycle.

[0023] A supporting crossbar pointing generically upwards and away from the hinge between said two uprights is removably attached to one of the two supporting uprights.

[0024] The free end of said supporting crossbar is fitted at one end with a seat for the revolving connection of said wheel or flywheel. In particular, said seat and said
The wheel or flywheel are arranged so that their axis of rotation lies parallel to the axis of rotation of said hub and cogs.

The wheel or flywheel is complete with a sprocket and can be fitted with braking means.

The wheel or flywheel and the hub with the cogs are mounted on the supporting element so that, when the rear fork of a bicycle is inserted and fixed to said hub, the cogs of said hub come to be on the same side as the rear derailleur gear of said bicycle, and so that said wheel or flywheel comes to be on the side of the bicycle opposite to said hub.

It is preferable for the chain wheel on the hub that transmits the movement to the wheel or flywheel, and consequently to the sprocket in the wheel or flywheel, to be on the same side of the hub as the cogs.

Provision is also made to enable the removal and repositioning both of the hub with the cogs and of the wheel or flywheel so that the cogs on the hub are on the opposite side, i.e. on whichever side the user prefers.

The connection between the sprocket in the wheel or flywheel and the chain wheel on the hub is preferably achieved by means of a cycling chain of known type.

A guard is provided for protection and safety, covering the wheel or flywheel and the chain. Said guard is removable to give access to the area of the hub.

The new cycle trainer device is very straightforward to use: users simply have to release the rear wheel from their bicycles and hook the rear fork of their bicycles into a generically parallel position.

A hub (M) with cogs (Dc, Dr) is installed on a wheel (R) or flywheel, and consequently to the sprocket in the wheel or flywheel, to be on the same side of the hub as the cogs.

Provision is also made to enable the removal and repositioning both of the hub with the cogs and of the wheel or flywheel so that the cogs on the hub are on the opposite side, i.e. on whichever side the user prefers.

The connection between the sprocket in the wheel or flywheel and the chain wheel on the hub is preferably achieved by means of a cycling chain of known type.

A guard is provided for protection and safety, covering the wheel or flywheel and the chain. Said guard is removable to give access to the area of the hub.

At the end of the training session, or at a later time, the cyclist can release the bicycle from the new device and reinstall the normal rear wheel on the rear fork of the bicycle.

The new device can be dismantled and/or folded so as to occupy less space; the guard can be removed and dismantled, then the two supporting uprights are folded into a generically parallel position.

The overall dimensions of the device can also be further reduced by removing the wheel and dismantling the wheel-supporting crossbar from the uprights of the supporting element.

Aerodynamic braking elements can be applied to the wheel or flywheel to generate a greater resistance to the rotation of the wheel or flywheel that increases as the rotation speed of said wheel or flywheel increases.

The connection between the sprocket (Rp) in the wheel (R) or flywheel and the chain wheel (Dr) on the hub (M) is preferably achieved by means of a bicycle chain (C) of known type.

A protection and safety guard (P) is provided over the wheel (R) or flywheel and the chain (C). Said guard (P) is removable to give access to the area of the hub (M) and to the corresponding cogs (Dc, Dr).
A cycling training device for application on bicycles (B) is characterised in that it comprises:

- a supporting element (S) complete with a seat for housing a hub (M) suitable for coupling with the rear fork (Bf) of a bicycle (B);
- a hub (M) with several cogs (Dc) lying side by side with decreasing diameters and a further chain wheel (Dr), wherein said cogs (Dc) lying side by side are suitable for coupling with the chain (Bc) of the bicycle (B) connected to said new device;
- a wheel (R) or flywheel attached to said supporting element (S) in a position opposite the position of the bicycle (B) hooked onto said hub (M), wherein a sprocket (Rp) attached parallel and coaxial to said wheel (R) or flywheel is kinetically connected to the chain wheel (Dr) on said hub (M).

1. A cycling training device for application on bicycles (B) characterised in that it comprises:
   - a supporting element (S) complete with a seat for housing a hub (M) suitable for coupling with the rear fork (Bf) of a bicycle (B);
   - a hub (M) with several cogs (Dc) lying side by side with decreasing diameters and a further chain wheel (Dr), wherein said cogs (Dc) lying side by side are suitable for coupling with the chain (Bc) of the bicycle (B) connected to said new device;

2. A cycling training device according to claim 1, characterised in that said supporting element (S) comprises two uprights (S1, S2) arranged to form an inverted V-shaped stand and complete at their lower ends with two supporting feet (S4), wherein said uprights (S1, S2) are hinged near or at the tip of said inverted V-shaped stand.

3. A cycling training device according to claims 1, 2, characterised in that it has a seat suitable for containing said hub (M) and cogs (Dc, Dr) arranged to form an inverted V-shaped stand, wherein said seat and said hub (M) are arranged so that the axis of rotation of said hub (M) lies at right angles to the plane of said two uprights (S1, S2).

4. A cycling training device according to claims 1, 2, characterised in that there is a supporting crossbar (T) on one of the two uprights (S1) forming the supporting element (S), wherein a wheel (R) or flywheel is fitted to the free end of said supporting crossbar (T), with axis of rotation lying parallel to the axis of rotation of said hub (M).

5. A cycling training device according to claim 4, characterised in that said supporting crossbar (T) is removably attached to said upright (S1) of the supporting element (S), wherein a wheel (R) or flywheel is connected by means of a bicycle chain (C) to the chain wheel (Dr) on said hub (M).

6. A cycling training device according to claim 1, characterised in that it comprises a removable perforated protection guard (P) over the wheel (R) or flywheel and the chain (C) connecting said wheel (R) or flywheel to said hub (M).

7. A cycling training device according to claim 1, characterised in that it comprises a removable perforated protection guard (P) over the wheel (R) or flywheel and the chain (C) connecting said wheel (R) or flywheel to said hub (M).

8. A cycling training device according to claim 7, characterised in that said guard (P) permits access to
the area of the hub (M) and the related cogs (Dc, Dr).

9. A cycling training device according to claims 7, 8, 9, characterised in that said guard (P) can be removed and dismantled.

10. A cycling training device according to the preceding claims, characterised in that it has aerodynamic braking elements (F) applied to the wheel (R) or fly-wheel.
## DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
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<th>Citation of document with indication, where appropriate, of relevant passages</th>
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The present search report has been drawn up for all claims.

**The Hague**

Place of search

**26 November 2007**

Date of completion of the search

**Jones, Mark**

Examiner

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**CATEGORY OF CITIED DOCUMENTS**

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