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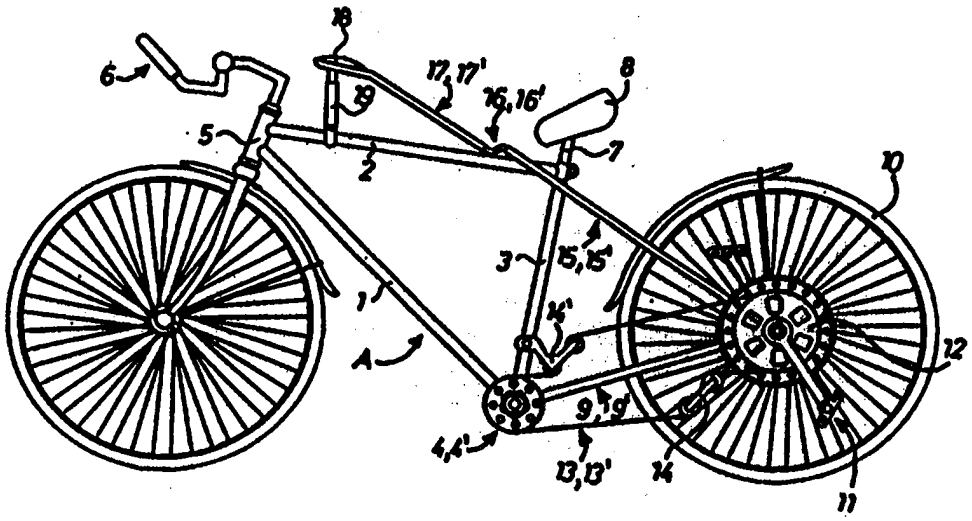
(54) Title: BICYCLE FOR RIDING IN LYING POSTURE



(57) Abstract

The invention refers to the bicycle for riding in lying posture, in particular to a bicycle fitted with chain gear and pedals, mounted in the driving wheel axle and provided with a specially designed frame which makes the cyclist assume a lying posture during the ride and provides for significantly faster ride. The bicycle referred to in this invention is provided with a specially shaped frame and with a specially adapted driving mechanism enabling the cyclist to assume an optimum posture, in particular during a fast ride. The specially designed frame consists of the basic part of the frame (A) in the form of an approximately right–angled triangle and of the auxiliary parts of the frame which enable the cyclist to assume a practically lying posture; thereby the pedals (11) and the chain wheel (12) are mounted on the axle of the last driving wheel (10) whereas the chain transmission is effected via the central section of the basic part of the frame (A) bearing the driving wheel (10) axle.

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BICYCLE FOR RIDING IN LYING POSTURE

The invention refers to the bicycle for riding in lying posture, in particular to a bicycle fitted with chain gear and pedals, mounted in the driving wheel axle and provided with a specially designed frame which makes the cyclist assume a lying posture during the ride and provides for a significantly faster ride. The invention is classified into Class B 62K 3/02 of the International Patent Classification.

The technical problem successfully solved by the invention in question refers to the design and implementation of such bicycle which allows for lying and/or the maximum possible aerodynamic posture of the cyclist in

order to achieve the maximum possible utilization and the fastest possible ride.

The known solutions of the submitted technical problem have been achieved on the example of a standard bicycle with the frame in the shape of an equilateral triangle and with the driving pedals mounted at the junction of both sides in the central part of the frame. Such shape of the bicycle frame and such mounting of pedals enable the cyclist to assume a posture which is sitting at normal ride. For better utilization of cyclist's powers a more stretched posture would be better, but could not be achieved with standard frame structures.

The bicycle referred to in this invention is provided with a specially shaped frame and with a specially adapted driving mechanism enabling the cyclist to assume an optimum posture, in particular during a fast ride. The specially designed frame consists of the basic part of the frame in the form of an approximately right-angled triangle and of the auxiliary parts of the frame which enable the cyclist to assume a practically lying posture; this is accompanied by mounting of pedals and of the chain wheel on the axle of the last driving wheel as well as by chain transmission via the central section of the basic part of the frame bearing the driving wheel axle.

The invention will be explained in detail on the concrete example and the corresponding figure representing

Figure 1 Side view of the bicycle for riding in lying posture, such as referred to in this invention.

The bicycle for riding in lying posture referred to in this invention, whereof the side-view is shown in Figure 1, consists of the basic part of the frame A, made up of profiled tubes 1,2,3, assembled in the form of a triangle with the tubes 2 and 3 forming an 80° - 90° angle and with the tubes 1 and 3 forming a 50° - 65° angle. At the junction of the tubes 1 and 3 there is mounted a freely rotating chain wheel 4, whereas the junction of the tubes 1 and 2 is rigidly fixed to the carrier tube 5 of the steering tube 6. From the junction of the tubes 2 and 3 there branches off the seat pillar carrying the seat 8 which is smaller than that of a standard bicycle and slightly leaned forwards. Its position is adjustable with reference to the cyclist's height; during the ride, when the cyclist is in lying posture, it only serves for a support.

From the junction of the tubes 1 and 3 of the basic part of the frame A there also branch off the rigidly fixed tubes 9,9' which make with the tube 3 an angle between 60° and 70°. At the end between both tubes 9,9' there is mounted the rotating driving wheel 10, carrying a pair of pedals 11 rigidly connected with the chain wheel 12 and freely rotating on the axle of the rear driving wheel 10. The chain wheel 12 is chain connected (chain 13) via the gears 14,14' with the chain wheel 4 which is rigidly connected with the opposite chain wheel 4'. The chain wheel 4' is chain connected

(chain 13') with the chain wheel or wheels 7 that are mounted on the axle of the driving wheel 10.

The ends of both tubes 9,9' are rigidly connected with tube 2 of the basic part of the frame A via the tubes 15,15' to form between the tubes 9,9' and 15,15' an angle of 50^{o} - 60^{o}. The free ends of the tubes 15,15' continue, via flexible joints or bearings 16,16' into the tubes 17,17' which finally join in the breast support 18 which is in its turn mounted on the tube 2 of the basic part of the frame A via a spring-type shock absorber 19.

While riding the bicycle referred to in this invention, the cyclist is in lying posture, not sitting, but rather stretched in the way that his breast is supported by the breast support 18 which due to the shock absorber 19 represents a counter-support to the cyclist's weight. In this way the cyclist assumes a very aerodynamic posture, which reduces the air resistance and in its turn provides for higher speed and/or better utilization of the cyclist's power. In addition, the fixing of the driving pedals 11 on the axle of the rear wheel 10 allows for full utilization of the cyclist's lying posture during the ride as well as for maximum utilization of his pedalling.

PATENT CLAIM

1. The bicycle for riding in lying posture referred to in this invention, consisting of the basic part of the frame A, made up of profiled tubes (1,2,3), rigidly assembled in the form of a triangle,

characterized in that

the tubes (2,3) form an 80° - 90° angle and the tubes (1,3) a 50° - 65° angle, with a freely rotating chain wheel (4) mounted at the junction of the tubes (1,3); the rigidly fixed tubes (9,9') branching off from the junction of the tubes (1,3) of the basic part of the frame (A), make with the tube (3) an angle between 60° and 70° in the way that at the end between both tubes (9,9') there is mounted the rotating driving wheel (10), carrying a pair of pedals (11) rigidly connected with the chain wheel (12) and freely rotating on the axle of the rear driving wheel (10); that the ends of both tubes (9,9') are rigidly connected with the tube (2) via the tubes (15,15') to form between the tubes (9,9') and (15,15') an angle of 50° - 60° and that the free ends of the tubes (15,15') continue, via flexible joints or bearings (16,16') into the tubes (17,17') which finally join in the breast support (18) which is in its turn mounted on the tube (2) via a spring-type shock absorber (19); that the chain wheel (12) is chain connected (chain 13) via the gears (14,14') with the chain wheel (4), rigidly connected with the

opposite chain wheel (4') and chain connected (chain 13') with the chain wheel or wheels (7) that are mounted on the axle of the driving wheel (10).

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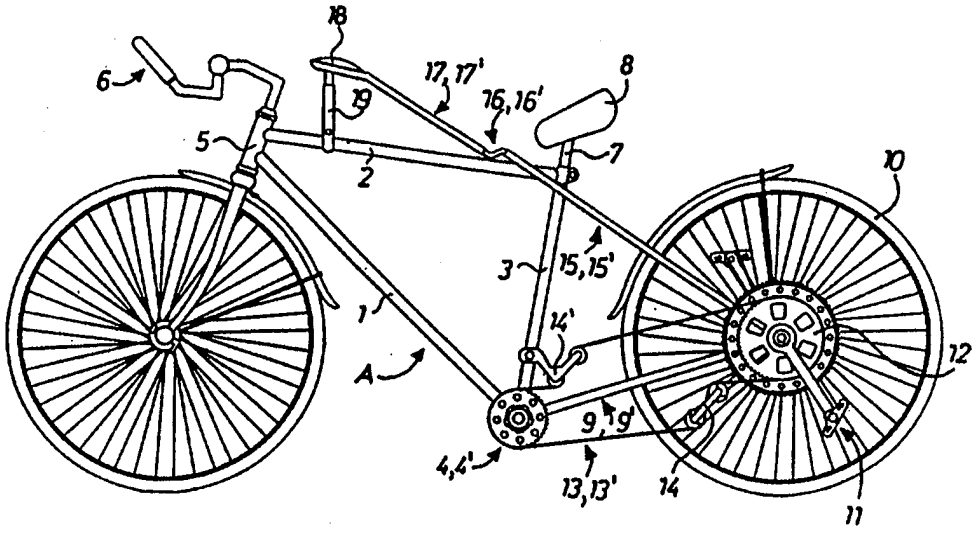

Figure 1

INTERNATIONAL SEARCH REPORT

Inte onal Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B62M1/02 B62K3/00

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)
IPC 6 B62M B62K

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 647 060 A (TOMKINSON) 3 March 1987 see claims; figures	1
A	FR 2 556 686 A (BLANC) 21 June 1985 see claims; figures	1
A	DE 39 06 342 A (SPAHN) 6 September 1990 see claim 1; figures 6,7	1
A	US 5 403 027 A (HWANG) 4 April 1995 see column 3, line 49 - column 4, line 28; figures 2,3	1
A	EP 0 154 118 A (TOUR MECCANICA) 11 September 1985 see claims 1,5; figures 1-3	1

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☒ Patent family members are listed in annex.

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1

Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4647060 A	03-03-87	US 4735430 A	05-04-88
FR 2556686 A	21-06-85	NONE	
DE 3906342 A	06-09-90	NONE	
US 5403027 A	04-04-95	NONE	
EP 154118 A	11-09-85	JP 60179378 A	13-09-85