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(56) Documents Cited
GB 2296903 A **WO 97/25240 A1** **WO 94/26580 A1**
US 5470088 A **US 5067738 A**
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(54) Abstract Title
Connector for joining cycles

(57) A connector for joining a trailing cycle 10 and a leading cycle 20, comprises a frame with two manually perpendicular rotation axes 36 and 40, mounted in brackets 38, 39. Axis 36 is connected to a link member comprising a fork 37 for attachments to the rear wheel fork 22 of the lead cycle, and an extendible member 31 engaging the seat part thereof. Axis 40 is connected to an arched member 43, engaging an axle 44 in front wheel forks 11 of the trailing cycle and with arm 45 engaging its cross bar 13.

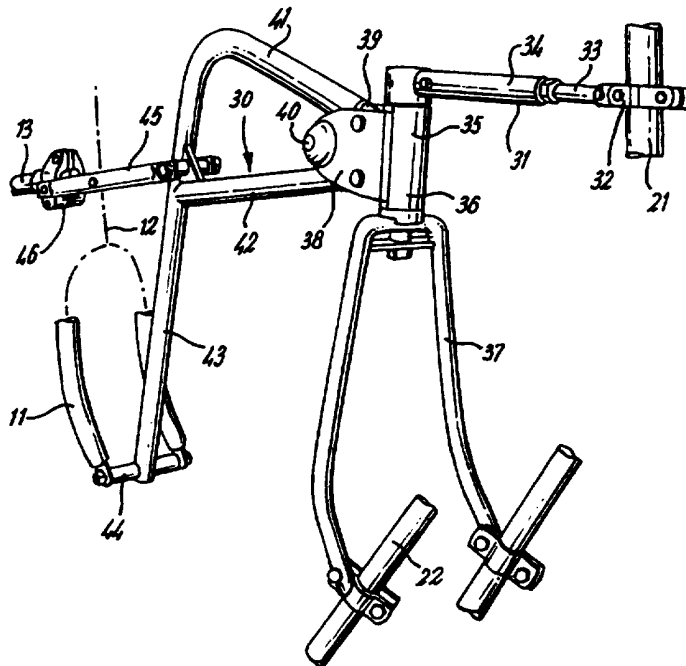


FIG. 1

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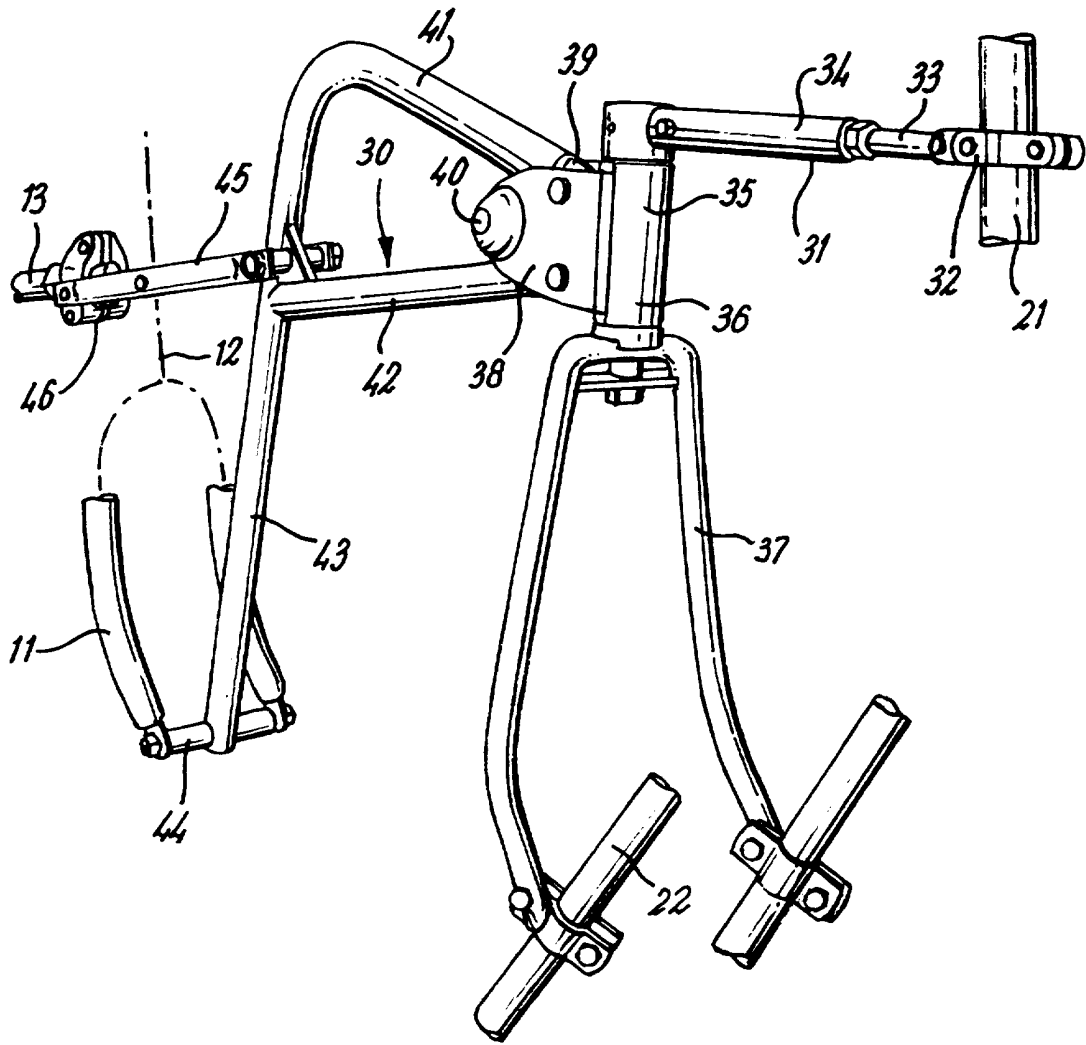


FIG. 1

CONNECTOR FOR JOINING CYCLES

This invention relates to a connector for joining cycles.

The term "cycles" is intended to apply to any light wheeled vehicle, particularly powered by pedals, but not excluding motor powered or assisted vehicles. The cycles to which the invention particularly relates are predominantly pedal bicycles, but may include e.g. tricycles.

The purpose of the connector is to connect two bicycles together in line to form a temporary tandem cycle, and is of use for example to connect a child's cycle (bicycle or tricycle) to the rear of an adult's cycle. This can enable a cycling party including a young child to travel further than an unaided child may be able to endure, as the adult can sustain the effort to propel both cycles.

Existing products which address this problem are limited and unsatisfactory. One solution attempted is the trailer bike. This has an extended crossbar which attaches to the rear of the adult's cycle, and does not have a front wheel or front forks. This severely limits their use, as when not in use as a trailer bike, it cannot be ridden independently by the child. Trailer bikes are also very expensive comparable to the cost of an independently rideable cycle. Another approach is to use an existing child's cycle which can be attached to a bracket which links it to the adult's cycle. The resulting connected vehicle is however notably unstable and often unsafe, since the trailing cycle is often subjected to steering and inclination forces which act against stability when cornering. Further, the attachment often requires major alteration to either or both of the cycles before the attachment can be connected, for example by removing the forks and handle bar stem of the trailing cycle.

An object of the invention is to provide a connector which can be used to temporarily join cycles, such as a child's bicycle to the rear of an adult's bicycle, without permanent or extensive alterations to either cycle.

According to the invention, a connector for joining cycles comprises a first member for attachment to the rear of a leading cycle, a second member for attachment to the front of a trailing cycle, means defining two separate mutually orthogonal pivot axes, one of said axes being disposed in the plane of the cycle's frames and adapted to be substantially vertical when the cycle frames are upright, and the second axis being substantially horizontal when the cycle frames are upright.

The first member may comprise a fork attached to the said one axis for attachment to the rear of the leading cycle and a further member may be provided for attachment to a part of the frame of the leading cycle, such as the seat post.

The second member may be connected to the said second axis, and terminate in an axle for inserting into the front forks of the trailing cycle after removal of the front wheel. An additional member may be provided for connection to the cross bar of the trailing cycle.

A preferred embodiment of connector according to the invention will now be described by way of example with reference to the accompanying drawings wherein:-

Fig 1 is a perspective view of a preferred embodiment of connector according to the invention;

Fig 2 is a general view showing two cycles connected into a tandem arrangement using the connector.

A connector according to the invention is used to connect two cycles together in a tandem formation (one in front of the other), for example connecting a child's bicycle 10 behind an adult's bicycle 20.

The connector comprises a frame 30, preferably of tubular metal, and comprises a seat column engaging member 31, with a clamp 32 to engage around a seat column 21 of a leading bicycle, the member 31 being formed as a telescopic strut having an extendible piston 33, which can be retracted into and pulled out of a sheath 34. Member 31 is connected to the inner part 35 of a pivot assembly 36, which is connected to a fork 37 for engagement with the rear wheel forks 22 of the leading bicycle.

The outer part of pivot assembly 36 is connected by spaced cheek plates 38, 39 to a second pivot comprising a pivot pin 40 which is orthogonal (at right angles) to the axis of the first described pivot assembly 36, and displaced from it so that the axes of the pivots do not intersect. A bowed member 41, with a reinforcing strut 42 is pivoted with respect to the cheeks 38, 39 etc. on the pivot pin 40 and terminates in a straight end section 43 which carries near its extremity a stub axle 44, which is adapted to engage in the front wheel forks of a cycle, e.g. the front wheel fork 11 of the trailing cycle 10.

A link arm 45 (which may be telescopic) is pivotally connected to the bowed member 41, and terminates in a clamp or connector 46 for engagement with a cross bar 13 of the trailing cycle

10. The position of the clamp on the crossbar can be adjusted, thereby varying the inclination of the connector and accommodating different relative sizes of cycles.

The connector 30 can be used to connect two bicycles together in an in-line tandem formation simply and easily, by removing the front wheel of the trailing cycle, and then connecting member 44 into the fork of the trailing cycle and then attaching clamps 46 to the cross bar 13 of the trailing cycle. Fork 37 is then connected to the rear forks of the leading cycle, and clamp 32 engaged with the seat column of the leading cycle. To separate the cycles and restore the rear cycle for the independent use, the connector frame is simply disconnected and the front wheel of the rear cycle replaced.

The non intersecting disposition of the pivot axes of pivots 36, 40 means that they do not interfere with each other, and stability is maintained as far as possible. Vertical pivot 36 provides for articulation of the tandem cycle assembly so that corners can be negotiated safely, whilst horizontal pivot 40 enables uneven ground to be traversed. The articulation on each axis is fully independent, and for example banking into turns is accomplished in unison, without any third axis pivoting to compromise this. This enables the riding skills of the leading (usually adult) rider to be used to the benefit of the following (usually a child) less experienced rider.

The connector according to the invention avoids many of the disadvantages of the existing products, and enables the change over to and from tandem connected riding from and to independent riding to be made quickly and easily.

Although the trailing vehicle is described as being a cycle, such as a child's bicycle or tricycle, the trailing vehicle could be non-ridden vehicle such as a trailer for carrying goods, such as camping or picnic equipment or the like.

Claims

1. A connector for joining cycles, comprising a first member for attachment to the rear of a leading cycle, a second member for attachment to the front of a trailing cycle, means defining two separate mutually orthogonal pivot axes, one of said axes being disposed in the plane occupied by the cycle's frames and adapted to be substantially vertical when the cycle frames are upright, and the second axis being substantially horizontal when the cycle frames are upright.
2. A connector according to Claim 1, wherein the first member comprises a fork attached to the said one axis for attachment to the rear of the leading cycle, and a further member for attachment to a part of the frame of the leading cycle.
3. A connector according to claims 1 and 2 wherein the second member is connected to the second axes, and terminates in an axle for insertion into the front forks of the trailing cycle after removal of the front wheel thereof.
4. A connector according to claim 3, including an additional member for connection between the second member and the cross bar of the trailing cycle.
5. A connector according to claim 2, wherein said further member of the first member is connected to the seat post of the leading cycle.

6. A connector according to claim 4 wherein said second member comprises an arched member to provide clearance over the rear wheel of the leading cycle, the end of which expands downwardly to engage with the front forks of the trailing cycle.

7. A connector according to claim 2 or 5 wherein said further member is telescopically extendible.

8. A connector according to any preceding claim, wherein said one axis is connected to said second axis by spaced apart members which provide mutually perpendicular bearings for said axes.

9. A connector for joining cycles substantially as seen before described, with reference to and as illustrated in the accompanying drawings.



Application No: GB 9806470.2
Claims searched: 1 to 9

Examiner: Colin Thompson
Date of search: 24 July 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.P): B7E (EAC)
Int CI (Ed.6): B62K 13/00, 13/02, 13/04
Other: Online: WPI, EDOC

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2296903 A (Doel) Whole document relevant	1,8
X,P	WO 97/25240 A1 (Park) See especially Fig 2	1,2,8
X	WO 94/26580 A1 (Marchetto) See especially Figs 3 & 4	1,8
X	US 5470088 A (Adams) See especially Fig 2	1,8
X	US 5067738 A (O'Connor) See especially Figs 5-7	1,8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.