

Technical note

Coupled bicycles for disabled and able-bodied to ride together

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Abstract

The present note describes a very simple and economic, yet highly successful, concept which makes use of two standard bicycles and should prove useful in developing countries.

Introduction

As rightly stated by Schwandt et al (1984) "individuals with lower limb disability who endeavour to live healthy and meaningful lives may benefit greatly in their physical, psychological and social wellbeing from participation in active recreation with family and friends".

Schwandt and coworkers have developed two very useful mechanical systems to serve that goal:

a single rider arm - powered bicycle, the *Handbike*;

a tandem consisting of merging the *Handbike* in the front with a standard bicycle in the back.

It is important to point out that a manufacturer has recently begun initial production of the *Handbike* and several versions are now available.

A very simple solution has been devised at the Institute of Applied Mechanics. This consists of coupling two standard bicycles — the machine ridden by the patient is fitted with a fixed pinion. The solution is economic and efficient from the point of view of disabled people living in developing countries where more specialized equipment is generally not available. Frequently, only crutches, canes and simple

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orthotic devices are fabricated. Foreign appliances tend to be extremely expensive. Furthermore the concept discussed in this note can be easily implemented by the family and/or friends of the disabled.

Results

The experiences of the author with disabled children using the system have been highly successful.

The disabled child shown in Figure 1 riding with his elder brother suffers from a severe case of cerebral palsy (spastic quadriplegia).

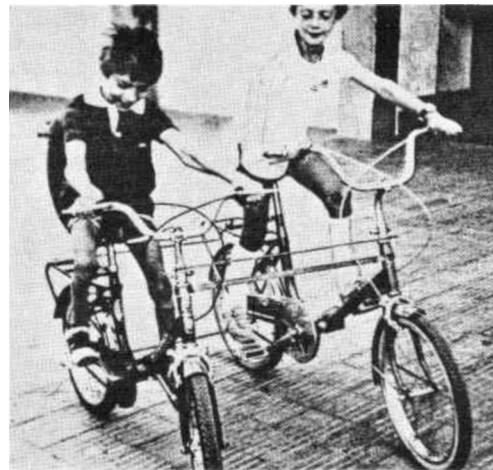


Fig. 1. Disabled 9 year-old boy riding the IMA coupled-bike system.

His overall improvement has been considerable and after a period of three months using the coupled-bike system (shown diagrammatically in Fig. 2) he is able to single-ride a standard bicycle with two additional small wheels attached to the rear wheel axis.

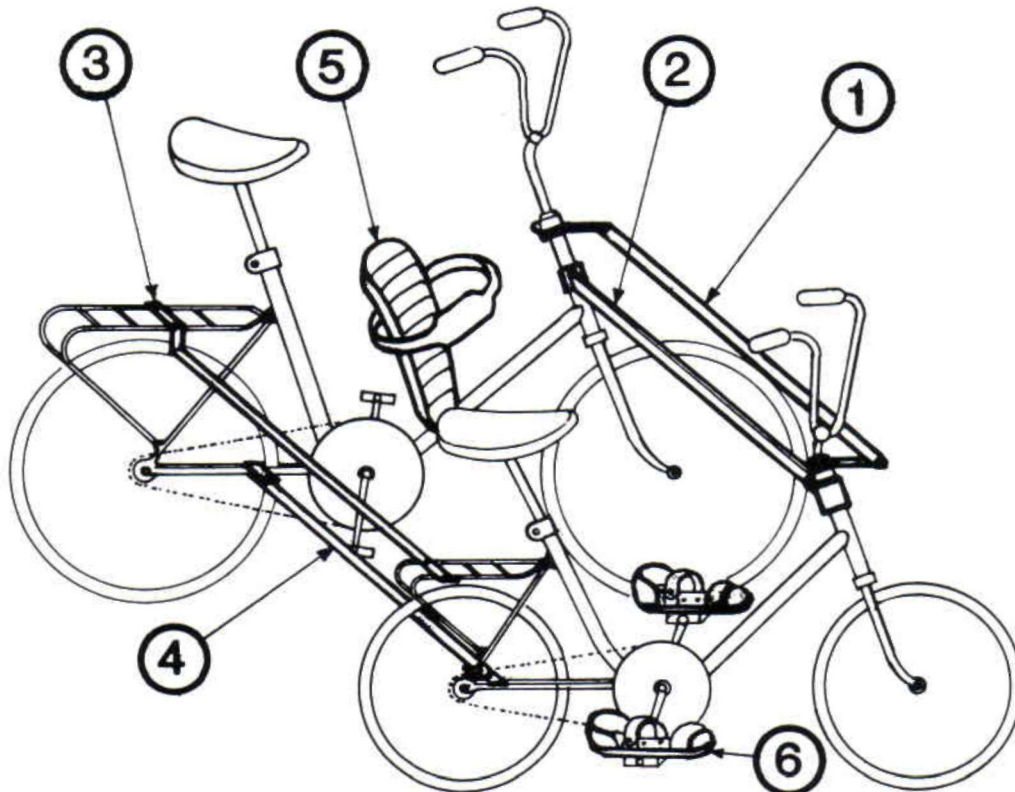


Fig. 2. Basic elements for coupling two standard bicycles: 1 and 2, front upper and lower transverse bars. 3 and 4, back upper and lower transverse bars. 5, special seat. 6, foot harness.

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