



**GUJARAT TECHNOLOGICAL UNIVERSITY  
(GTU)  
INNOVATION COUNCIL (GIC)  
Patent Search & Analysis Report  
(PSAR)**



**Date of Submission : 18/09/2019**

Dear Borsadiya Kirtikkumar Arvindbhai,

Studied Patent Number for generation of PSAR : 19BE7\_160160102008\_1

### **PART 1: PATENT SEARCH DATABASE USED**

- |                                   |   |   |
|-----------------------------------|---|---|
| 1. Patent Search Database used    | : | Google Patents  |
| Web link of database              | : | <a href="https://patents.google.com/">https://patents.google.com/</a> |
| 2. Keywords Used for Search       | : | Pedal ,Drive,Mechanism,Bicycle  |
| 3. Search String Used             | : | Pedal drive mechanism for bicycle                                     |
| 4. Number of Results/Hits getting | : | 100   |

### **PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA**

- |   |   |  |
|---|---|--|
| 5. Category/ Field of Invention               | : |  |
| 6. Invention is Related to/Class of Invention | : | The drive mechanism increasing the torque resulting from a force applied to the pedals |
| 6 (a) : IPC class of the studied patent       | : | B62M-1/00; B62M 5/00   |
| 7. Title of Invention                         | : | PEDAL DRIVE MECHANISM  |
| 8. Patent No.                                 | : | US5172926A   |
| 9. Application Number                         | : | 623,016  |
| 9 (a) : Web link of the studied patent        | : | <a href="https://patents.google.com">https://patents.google.com</a>                    |
| 10. Date of Filing/Application (DD/MM/YYYY)   | : | Dec. 6, 1990   |
| 11. Priority Date (DD/MM/YYYY)                | : |  |
| 12. Publication/Journal Number                | : |  |
| 13. Publication Date (DD/MM/YYYY)             | : |  |
| 14. First Filled Country : Albania            | : |  |

**15. Also Published as**

Sr.No	Country Where Filled	Application No./Patent No.
1		

**16. Inventor/s Details.**

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Paul V Mannino	144 Barbara Dr.

**17. Applicant/Assignee Details.**

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Paul V Mannino	144 Barbara Dr.

**18. Applicant for Patent is** : Individual

**PART 3: TECHNICAL PART OF PATENTED INVENTION****19. Limitation of Prior Technology / Art**

Additional parts used, the lever arm and guide lever, add further unde sirable complexity and moving parts to the conventional bicycle mechanism.

**20. Specific Problem Solved / Objective of Invention**

power drive mechanism for bicycles wherein the pedals move in a D-shaped pattern, rather than in the circular manner of conventional bicycles. This D-shaped pattern seeks to increase the force produced by the rider's motion, avoid "dead spots" associated with conventional bicycle mechanisms, and improve upon the torque transmitted to the rear wheels.

**21. Brief about Invention**

The drive mechanism includes a drive sprocket rotatably mounted to the bicycle frame, a pair of opposing pedal cranks, a pair of lever arms, each lever arm being rotatably secured to one of the opposing cranks such that there is a distance between the point of connection and the pedal, a pair of guide members, each of which are pivotally connected to the respective lever arms remote from the respective pedals and being pivotally connected to the bicycle frame such that the guide members can limit movement of the respective lever arms, and thereby provide a more efficient path of movement for the pedals.

**22. Key learning Points**

Unlike a conventional mechanism, the crank lever is connected to the crank gear by a lever arm. The lever arm travels on a circular path while the crank gear is configured to follow a D-shaped path. The distal end of the crank lever (that is, the end not attaching the pedal), is connected to a guide lever connected to the bicycle frame, which ensures that the crank levers remain constantly in motion.

**23. Summary of Invention**

The present invention relates to a drive mechanism having a rotatable drive wheel, a lever arm rotatably connected to the drive wheel at a point between the first end and second end of the lever arm, whereby the connection point is moveable in a substantially circular path about the axis of the drive wheel, and guide means connected to the lever arm for supporting the second end of the lever arm and limiting the movement of the lever arm, whereby a force exerted against the first end of the lever arm causes the first end to move through an arcuate path with respect to the axis of the drive wheel, and after completing the arcuate path, the first end moves through a return path to reposition the first end at the beginning of the arcuate path, the return path being closer to the axis of the drive wheel than the arcuate path.

**24. Number of Claims** : 33

**25. Patent Status** : Expired Patent

**26. How much this invention is related with your IDP/UDP?**

< 70 %

**27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)**

frame elements in a double-triangle frame configuration Such as a chain stay, seat tube, bottom bracket, and down tube can be eliminated and thereby allow a reduction in weight.