**GOVERNMENT OF INDIA**  
**THE PATENT OFFICE**  
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*(Rule 74 of the Patents Rules)*

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- **Patent No.**: 351230
- **Application No.**: 3633/CHE/2012
- **Date of Filing**: 03/09/2012
- **Patentee**: INDIAN INSTITUTE OF TECHNOLOGY MADRAS (IIT Madras)

It is hereby certified that a patent has been granted to the patentee for an invention entitled **A HUMAN POWERED DEVICE** as disclosed in the above mentioned application for the term of 20 years from the 3rd day of September 2012 in accordance with the provisions of the Patents Act, 1970.

**Note.** - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 3rd day of September 2014 and on the same day in every year thereafter.
To: SHRI. D. MOSES JEWAKAR, ADVOCATE & PATENT AGENT, 245/105, METTU STREET, AYANAVARAM, CHENNAI - 600 023.

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This is to inform you that following the examination of above mentioned patent application under section 12 and 13 of The Patents Act, 1970 and Rules made thereunder [and hearing held on ------- ] a patent is hereby granted and recorded in the Register of Patents on the 10/11/2020. The Patent Certificate is enclosed herewith.

Patent No: 351230

Name of Applicant: INDIAN INSTITUTE OF TECHNOLOGY MADRAS (IIT Madras)

Date of Patent: 03/09/2012

Priority Date: 03/09/2012

Filling date of Request for examination: 26/07/2013

Title: A HUMAN POWERED DEVICE

Number of claims: 1-7

The grant of above mentioned patent will be published in the Official Journal of the patent Office under section 43 of the Act.

The payment of renewal fee is required to be made at this office within three(3) months from the aforesaid date of recording according to the proviso in sub-section(4) of Section 142 of The Patents Act,1970, as amended by The Patents (Amendment) Act, 2005 / The Patents Rules, 2003 as amended by The Patents (Amendment) Rules, 2016.

Omvir Singh
(Controller of Patents)

Note:
1. Revised Renewal fee schedule is available on the official website of Controller General of Patents, Designs and Trade Marks www.ipindia.gov.in.
2. No hard copy of Patent Certificate shall be issued separately by the office.
We Claim,

1. A device useful for converting the stair climbing motion of one or more users into rotary output.

2. A device of claim 1, wherein comprises a drive-train, clutch assembly, brake assembly, peripheral connections and a supporting structure.

3. A device of claim 1, wherein drive-train includes a set of pedals which are actuated by the user. It further includes the primary and secondary shafts and a set of pawl and ratchets that are used to convert the intermittent rotary motion into a continuous rotary motion.

4. A device of claim 1, wherein the clutch assembly is used to separate the operator from the load. It may work by disengaging the pedals from the primary shafts. It may be operated by the user through a lever.

5. A device of claim 1, wherein the brake assembly is used to stop the motion of the secondary shaft and therefore, by extension of the primary shaft and the pedal as well. It may work on the principle of friction braking and is applied on the secondary shaft. It may be operated by the user through a lever.

6. A device of claim 1, wherein the peripheral connections are used to utilize the rotary motion from the device to perform various tasks such as material lifting and rod bending. The support structure provides a structural support to the aforementioned components.

7. A device of claim 1, wherein the user operates the device by executing a stair climbing motion using the pedals which are connected to the primary shafts. The primary shafts are supported on the bearings which are in turn mounted on the support structure.

8. A device of claim 1, wherein the stair-climbing motion of the operator oscillates the pedals which in turn rotate the primary shafts. The primary shafts are connected to the respective sprockets via a pair of clutch assemblies. The sprockets are connected to smaller sprockets mounted on the secondary shaft via chains.

9. A device of claim 1, wherein introduces a multiplication of the rotational speed. The smaller sprocket has an in-built pawl and ratchet assembly which ensures that motion only along one direction is passed from the primary shaft to the secondary shaft. It is required to ensure that while the operator is reversing the pedals it does not lead to a reverse rotation of the secondary shaft.

10. A device of claim 1, wherein has a modular design. Multiple devices can be connected together in series to add their powers and torques. Thus, the same device which is used by a rod-bender for low power requirements can also be used by multiple operators for
lifting heavy weight in construction sites and may be effectively designed to be a plug-and-play aid in several manual jobs bringing the modularity in the design.
Dated at Chennai this June 15, 2013

Signature: [Signature]
D. Moses Jeyakaran,
Advocate & Patent Agent
IN/PA – 369