

JACK ASSEMBLY

IITM Technology Available for Licensing

Problem Statement

- Existing seat height adjustment mechanisms in vehicles are complex, costly, and limit under-seat cargo space. These mechanisms require additional mounts for attachment, increasing vehicle weight.
- Scissor mechanisms restrict movement** below a reference seat height. Further, Deeply recessed door sills hinder seat swivel motion.
- Commercially available jack assemblies are heavy, **lack safety and have uneven weight distribution** and high-stress concentrations.
- There is a need for a **simpler jack assembly that can adjust seat height** and lift objects vertically in both upward and downward directions.

Intellectual Property

- IITM IDF Ref. **2425**
- IN 437237 - Patent Granted**

Technology Category/ Market

Category- Mechanical Engineering & Industrial Design

Applications- Heavy-duty applications such as car jacks, warehouse forklifts, and scissor lifts.

Industry- Automotives, Furniture Manufacturing, Construction and Industrial Machinery.

Market - Global automotive assembly market was valued at US\$ 41,490 Million in 2021 and is expected to reach US\$ 68,750 Million by 2030 at a CAGR of 5.80% between 2022 and 2030.

TRL (Technology Readiness Level)

TRL - 4: Technology validated in lab scale.

Research Lab

Prof. Rengaswamy Jayaganthan,
Dept. of Engineering Design

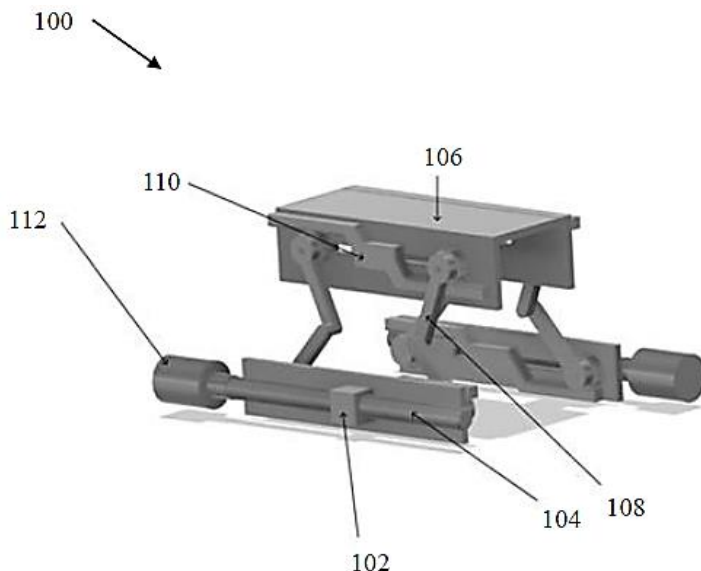


FIG.1. illustrates a perspective view of a jack assembly.

Technology

- The present invention relates to a jack assembly (100) which allows easy operation of height adjustment of an object. (Fig. 1&2)

The jack assembly (100) includes a first rack assembly (102) coupled with a threaded rod (104) rotation of which moves the first rack assembly (102) in a horizontal direction.

The first rack assembly (102) is coupled with a base (106) of an object to be lifted through at least two L-shaped arms (108).

The base (106) comprises a linear slot in which a second rack assembly (110) is attached.

Ends of the at least two L-shaped arms (108) are in threaded engagement with the first rack assembly (102) and the second rack assembly (110) through a plurality of pinions, and movement of the first rack assembly (102) in the horizontal direction rotates the at least two L-shaped arms (108) to move the second rack assembly (100) in turn which will move the base (106) of the object in a vertical direction.

CONTACT US

Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
<https://ipm.icsr.in/ipm/>

Email: smipm-icsr@icsrpis.iitm.ac.in
sm-marketing@imail.iitm.ac.in

Phone: +91-44-2257 9756/ 9719

Key Features / Value Proposition

- The jack assembly offers a simple structure, making it easy to operate for height adjustment of objects/articles.

Simplicity

- It allows for an extended range of vertical motion for objects, providing flexibility in positioning.

Extended Range of Motion

- The assembly can be retrofitted into existing jack mechanisms, offering an upgrade solution.

Retrofit Capability

- The assembly easily adjusts the height of objects, such as seats, in both upward and downward directions.

Bi-directional Adjustment

- Suitable for heavy-duty applications such as car jacks, warehouse forklifts, and scissor lifts, ensuring robust performance.

Heavy-duty Applications

- It incorporates modular components, enhancing reparability and ease of maintenance.

Repairability

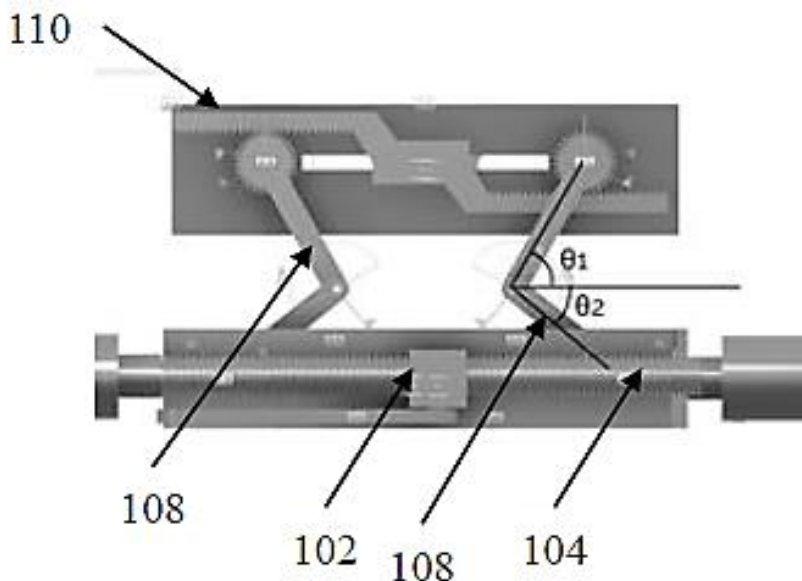


FIG. 2. illustrates a profile view of the jack assembly.

CONTACT US

Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
<https://ipm.icsr.in/ipm/>

Email: smipm-icsr@icsrpis.iitm.ac.in

sm-marketing@iitm.ac.in

Phone: +91-44-2257 9756/ 9719