

Modular Escalating Wheelchair Lift

Published date: Feb. 18, 2019

Technology description

PAGE SUMMARY

By 2030 the number of physically disabled seniors in the US will double, approaching nearly 24 million. For disabled seniors, veterans and other member of the US and international population that require a wheelchair, negotiating stairs both in the home and workplace is a significant obstacle. There are three general categories of device on the market to aid the wheelchair-bound in climbing stairs: those that integrate the user' s wheelchair, which typically require drastic structural alterations to the home and/or are obtrusive and prohibitively costly; those that require the user to shift onto a separate device, which require the assistance of another person; and specialized stair-climbing wheelchairs, which are prohibitively expensive. To address these drawbacks, a team of Drexel students and researchers have implemented a simple two-railed system for traversing stairs with a wheelchair. The rails rest on the stairs and consist of modular segments which can be fixed together to match the length of any staircase, and can be spaced to accommodate wheelchairs of differing wheelbases. One of the two rails is laterally adjustable and configured with a worm drive to automatically move to one side of the staircase when not in use. They are furthermore supported by adjustable feet, removing the need for structural alteration, and incorporate a modular high torque rack-and-pinion system for moving the wheelchair along the rails. This lift greatly enhances the quality of life of the wheelchair-bound by providing a low-cost, unobtrusive system that allows the user, in his/her own wheelchair, to traverse a flight of stairs without assistance.

FIGURES: Insert Figure Image Inside Figure Tags within Editor

Figure 1

Figure 2

Application area

Transporting wheelchairs up and down straight staircases

Ideal for situations where outside assistance is unavailable

Advantages

Unobstrusive - Doesn' t obstruct the staircase

Lightweight - Less than 100 lbs

Easy to Install – less than an hour assembly, requires no structural alteration to the stairs

Affordable - \$2,000-\$3,000 cost per unit

Easy to Use – Remote control with large buttons; does not require assistance of a second person

Versatile - Adjustable to fit stairs with different slopes and lengths, and wheelchairs with various wheelbases

Institution

[Drexel University](#)

Inventors

[Steve Eggert](#)

student

MEM

[Nicholas Raiser](#)

student

MEM

[Jordan Berman](#)

student

MEM

[Giancarlo Migliuolo](#)

student

MEM

[Jonathan Awerbuch](#)

Professor

Mechanical Engineering & Mechanics

联系我们



叶先生

电话：021-65679356

手机：13414935137

邮箱：yeyingsheng@zf-ym.com