

Product Presentation

Applicant Name: **B-FREE TECHNOLOGY LTD**

Product Name: **HAULERBOT**

Specification: Patented two-part design principle
Remote Control
Payload up to 120KG
Max Range 14KM
Battery life 4.5HR (depends on usage)



- **Core Functions:**

Haulerbot is a wireless control powered moving mechanism with compact size, capable of carrying construction materials / tools moving around construction sites in confine spaces, climbing stairs steady and reliable with its patented invention design.

- **Technology Used:**

- Patented moving mechanism structure of Pedrail
- Gyro balancing system

- **Construction Process involved:**

Ming Wah Mansion

Pak Tin Estate

- **Key Improvement in Construction Process:**

- Productivity
- Safety

Job Reference:

- RC construction climber, Tsing Yi, trial, Sept 10 2019]
- Haulerbot project, Ming Wah Mansion, trial, Mar 022020
- Haulerbot site trial, Ming Wah Mansion, Sep. 2020
- Pak Tin Estate site use, April 2021

Innovative Features

- Core Technology:

Two-part design / Track Moving mechanism / All terrain pedrail and wheel system

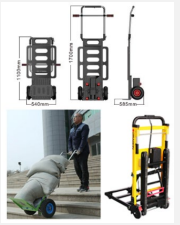


- Patent (if applicable):

Invention Name : Track Moving Mechanism 履帶式移動機構					
Country	Ref. No.	Status	Date	Category	Validity
China	ZL 2017 2 0481716.7	Grant	16/11/2018	Utility (實用新型)	15/11/2028
Hong Kong Short-Term	17103073.5	Grant	24/11/2017	Invention	23/03/2025
China	201710305536.8	Published	03/05/2017	Invention	20 years
Japan	6503402	Grant	29/03/2019	Invention	13/04/2037

Invention Name : 履帶機構和其履帶					
Country	Ref. No.	Status	Date	Category	Validity
China	ZL 201720533335.9	Grant	04/05/2018	Utility (實用新型)	15/05/2027
Hong Kong Short-Term	17103791.6	Grant	12/04/2017	Invention	24/11/2025

Innovative Features

- Comparison with current practice to *popular models and **Pre-approved list products and competitors:

Product	Core Function	Key Specification	Innovative feature
<p>*</p> 	<p>Manual control stair climber which capable of carrying construction materials going up and down stairs.</p> <p>Those products demand manual pulling effort by the operator for stability and steering, hence risking accident of toppling everything down the stairs and psychological strain on the operator.</p>	<ul style="list-style-type: none"> ◇ Wheel + Single Track design ◇ Payload up to 170KG ◇ Climbing 900-1200 steps ◇ Electronic braking ◇ Manual control 	<p>Widely used on light weight logistics market. The only innovative feature is enhanced with single track to apply on stair-climbing manually.</p>
<p>**</p> 	<p>A wireless control battery-operated Universal Service Vehicle capable of carrying construction materials/tools moving around construction sites with different terrain conditions.</p> <p>Bulky size caused lack of agility in confine spaces. It's single track design" is rather bumpy on rough terrain as the base of the track is straight. It's claimed stair-climbing, not applied on uneven steps and steep inclinations, dangerous situation of "single point contact" will frequently occur. When reaching the top of the staircase, such robot may risk toppling down suddenly. Meanwhile, debris will be stuck inside pedrail and reduce the life span of units.</p>	<ul style="list-style-type: none"> ◇ Single-track design principle ◇ Payload up to 200KG ◇ Max Range 100M ◇ Battery life 8HR ◇ Remote Control 	<p>"single track" design is widely used on heavy load vehicle market. The only innovative feature is enhanced with remote control only.</p>
	<p>The applied product is a wireless control powered moving mechanism with compact size capable of carrying construction materials / tools moving around construction sites in confine spaces, climbing stairs steady and reliable with its patented invention design.</p>	<ul style="list-style-type: none"> ◇ Patented two-part design principle ◇ Payload up to 120KG ◇ Max Range 14KM ◇ Battery life 4.5HR ◇ Remote Control ◇ Compact size ◇ Agility 	<p>The applied product adopts 2 patented designs;</p> <ol style="list-style-type: none"> 1. "Two-Part Design" divides a single track into two, to form the "flash shape" by the two separate pedrails to enable its excellent function of easy crossing of rough surfaces and obstacles and to climb stairs of irregular inclines. 2. "All terrain pedrail and wheel system" it's convex "pedrail inner teeth" is innovatively shaped to match the "wheel housing concave teeth" to expel debris from the space between the pedrail and the wheel housing to prevent debris accumulation, hence greatly increasing the life span of the unit.

Innovative Features

- First Launch Date: [Apr 01 2020](#)

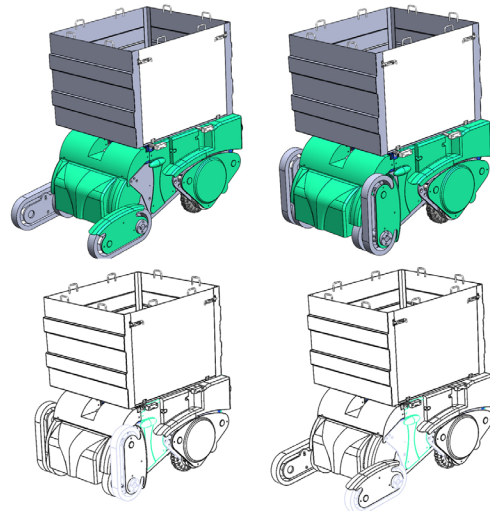


- Awards (if applicable):
 - [2015 Invention Geneva, Gold Medal \(Congratulation from the jury\)](#)
 - [2015 Hong Kong Awards for Industries, Technological Achievement certificate of merit](#)
 - [2015 FEDex Small Business Grant Contest, Grand Prize](#)
 - [2016 Spirit of Hong Kong Award, Innovation for good](#)
 - [2017 Hong Kong Technology Awards, Most innovative mobility solution -HK](#)

Adoption Example

- Project for Illustration:
Haulerbot, Ming Wah Mansion, 2nd March 2020
- Work Process:
 - Trial run on 2ND MARCH 2020
 - Site trail in Sept 2020
- Use/ Function in project:
 - Loading 120kgs from loading site to 5th floor
 - Loading 120kgs moving around construction site

3D outlook
drawing



Demo video

(<http://bfreetech.com/haulerbot>)

Benefits – Productivity (if applicable)

- Improve productivity by:

- Efficiency

Our product is an all-terrain robot and is able to easily carry loads around construction sites of rugged terrains, slopes and stairs, it is able to pick up loads from the storage area and unload to its destination in one go without needing other manpower and machines so as to greatly improve work efficiency.

Hypothetical calculation for labor efficiency;

Loading	Time need for move up 5 levels of stairs with load	Time need for move down 5 levels of stair with empty load	Total usage	Total load (kg)
1 st time (40kg)	100 seconds	80 seconds	1520 seconds (25m 20s)	120kg
2 nd time (40kg)	120 seconds	80 seconds		
3 rd time (40kg)	150 seconds	90 seconds		
break	900 seconds (15 mins)			

Hypothetical calculation for our product efficiency;

Loading	Time need for move up 5 levels of stairs with load	Time need for move down 5 levels of stair with empty load	Total usage	Total load (kg)
120 kgs / each time	180 seconds	180 seconds	360 seconds (6m)	120kg
break	Not necessary			

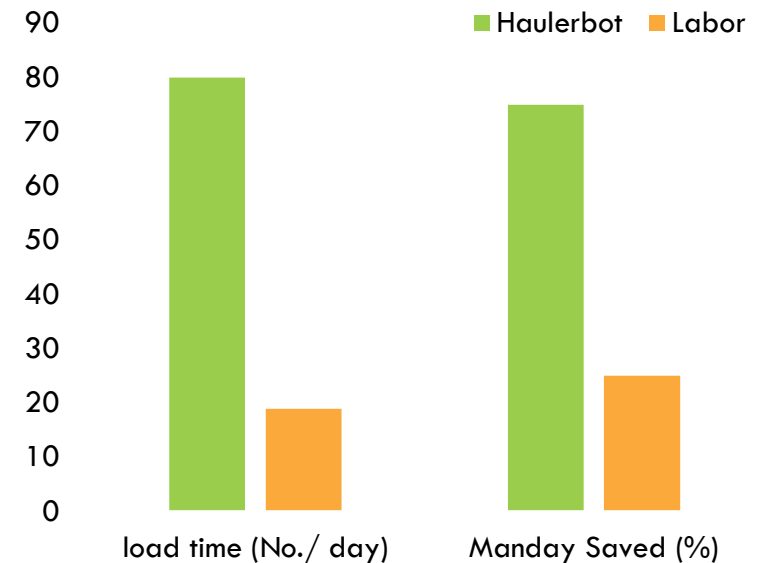
Base on the above calculation, assume work 8 hrs/day = 28800s

Labor capable to transport 18.95times / day

Our product capable to transport 80 times / day

Our product work efficiency is **4.22 times** that of tradition labor works.

Productivity Gain



Benefits – Safety (if applicable)

- Improve Safety by:

Remote control and heavy load smart moving mechanism

Traditional method



Tradition method demand manual pulling effort by the operator for stability and steering, hence risking accident of toppling everything down the stairs and psychological strain on the operator. Increase possibility of work-related injuries.

Our product



With our product's superb safety and remote-control functions, physical contact with the unit and its load is avoided to greatly reduce workers' physical demand, strain and risk of accidents so as to reduce overall construction cost and to meet the new era of win-win for both workers and the employers.