

CONVEYOR ASSISTED RAIL FOR WHEELCHAIR TRAVEL

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a mechanical conveyor to assist wheelchair bound users over inclined terrain.

Description of Related Art Including Information Disclosed Under 37 CFR 1.97 and 37 CFR 1.98

[0002] Improving the mobility of persons is covered by many existing inventions, specifically for those who are not able to move in manners mechanically similar to or as efficiently as the average person. These are often solved with innovations using tracks, rails, lifts, slopes and wheeled devices; all with the intent to provide ease of mobility and improved quality of life to their users. Many of these inventions are also meant to be combined with other established inventions and methods of increasing mobility to bring further enhancement.

[0003] US Patent 4,556,229 issued Dec. 3, 1985, by Franz Bihler; Anton Abele for Stair-Climbing Apparatus For Wheelchair discloses an apparatus for moving a wheelchair on a flight of steps has a support adapted to engage underneath the wheelchair in an upright condition of same with the chair pivotal on the support between erect and inclined positions. Two or more endless tracks on the support carry same and the wheelchair thereon so that the tracks allow the wheelchair to move over uneven terrain and up and down stairs. A latch is displaceable on the support between a holding position securing the wheelchair

in the inclined position and a freeing position permitting the wheelchair to move freely between its positions. A safety device connected to the latch is responsive to the inclination of the tracks relative to the horizontal for blocking the latch from moving into the freeing position when the tracks are inclined at more than a predetermined angle to the horizontal. Thus the wheelchair cannot be released from the support when same is moving on an incline. The latch is provided with a pedal to displace it into the freeing position. The support includes a frame element pivotal on the support about a horizontal axis transverse to the tracks and a device for securing the frame element to the wheelchair on the support.

[0004] US Patent 4,871,056 issued Oct. 3, 1989, by Chuichi Saito for Balustrade For Passenger Conveyor discloses a balustrade for a passenger conveyor, a main deck is fixedly mounted to an upper end of a vertically upright balustrade panel, and a guide frame is arranged on the main deck for slidingly guiding a handrail. In order to easily carry out an operation of fixedly mounting the main deck to the upper end of the balustrade panel, at least one fixing instrument is provided which has an inverted U-shaped fitting groove on one side and a fixing section on the other side, and the main deck is fixedly mounted to the upper end of the balustrade panel through the fixing instrument.

[0005] US Patent 5,566,621 issued Oct. 22, 1996, by Jarle Wanvik, Stein Lovoll for Conveyor Arrangement For Rolling Transport Devices discloses an inclined elevator compresses a traveling chain, rope or cable with one or more push devices fixed to it at intervals. The elevator is intended for bicyclists or

similar manned vehicles and is designed for installation in inclined streets, pedestrian tracks or in separate tracks specially designed for the purpose. The elevator chain, cable or rope is running in a conduit with a slot for extension of the push device. The conduit is permanently installed on the ground. The push device is either running hidden inside the conduit on the ground, or, when in use, running on top of the conduit. During operation the bicyclist is sitting on the bicycle, and the bicycle is rolled, pushed and guided on its own wheels. The push device of the elevator can easily be adapted to wheelchairs, wheel wagons or similar vehicles.

[0006] US Patent 7,926,618 issued Apr. 19, 2011, by Zuercher et al. for Portable Wheelchair Lift discloses a portable wheelchair lift device includes a lift car, a support base, and a lifting mechanism coupled there to selectively raise or lower the lift car while allowing the floor of the lift car to be fully lowered to the ground surface. A scissors-like brace selectively locks the front door of the lift car to the support base when the lift car is elevated. The lift car floor can be folded and collapsed to a reduced width allowing transport through narrow. Transport casters are removably mounted to the bottom of the lift car to facilitate transport. The lift device includes a height adjustment control within the lift car to repeatedly raise the lift car to the height of a stage.

[0007] US Patent 8,690,178 issued Apr. 8, 2014, by Griswold, et al. for Patient Transfer System discloses a system and method for patient transfer, including patient transfer from a bed to a rollable chair and patient transfer from a

wheelchair to a bed. A docking assembly can connect a rollable chair to a bed for transfer. The systems and methods can provide a safe, dignified, and comfortable transfer for patients. A transfer bed, a docking assembly, and a wheelchair can be used together as a system and can reduce the physical and psychological burden of bedridden patients and their caregivers. The transfer bed, docking assembly, and wheelchair can be appropriate for use within a patient's home, nursing home, hospital or any location where a patient is transferred between a bed and a wheelchair. The transfer bed, docking assembly, and wheelchair can be controlled such that a patient is transferred from a bed to a wheelchair or from a wheelchair to a bed.

[0008] The various known devices are designed in some way or another to assist low mobility persons but have disadvantages and limitations for the purposes of moving wheelchair bound persons up an established incline. Some require extensive and invasive installation methods to add to established paths, making them unsuitable for busy pathways or ones with limited space. Others show methods of lifting or rail devices that are not designed to ensure users can be safely moved long distances.

BRIEF SUMMARY OF THE INVENTION

[0009] A mechanical conveyor system of the present invention comprises a mechanically powered track assembly; a slotted track, wherein the user can be transported up any slope; a geared drive shaft; housing used for weather-proof purposes; an electric motor controlled by a relay; support poles for the user to

hold onto while escalating up the slope; a foldable ergonomic panel attachment to interface with wheelchairs and other wheeled platforms; and user input controls used by the wheelchair user.

[0010] Additionally, the mechanized conveyor system provides a flip gate exit system; wherein a secondary user of the invention can use the mechanized conveyor system.

[0011] Additionally, the mechanized conveyor system also comprises an additional control input on the back of the motor housing.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

[0012] **FIG. 1** is a side plan view of a total rail system of the present invention.

[0013] **FIG. 2** is an overhead plan view of the core rail system of the present invention with optional additions included.

[0014] **FIG. 3** is a rear plan view of the panel attachment connected to the rail system.

List of Reference Numerals

[0015] **2** conveyor system

[0016] **4** support poles

[0017] **6** pulleys

[0018] **8** track

[0019] **10** motor system

[0020] **12** motor system housing

- [0021]** 14 motor
- [0022]** 16 driveshaft
- [0023]** 18 gear
- [0024]** 20 activation button
- [0025]** 22 push panel
- [0026]** 24 hinged clamp attachment
- [0027]** 26 bracket
- [0028]** 28 clamp
- [0029]** 30 optional exit gate
- [0030]** 32 activation lever
- [0031]** 34 gate
- [0032]** 36 connection mechanism
- [0033]** 38 optional exterior activation button

DETAILED DESCRIPTION OF THE INVENTION

[0034] A fixed mechanized rail system of the present invention, installed along paved pathways of various lengths in order to independently assist wheelchair bound persons up said incline. The system is suited for both indoor and outdoor application wherein operation can be maintained regardless of weather or conditions. Installation of the system takes up minimal space alongside established pathways, adding mobility without obstruction to busy or narrow paths.

[0035] The rail system of the present invention provides wheelchair-bound persons the ability to travel long, inclined, or otherwise difficult pathways that could impede wheelchair bound persons through excessive exertion, lack of self-mobility, and without need for additional wheelchair apparatuses such as motorized wheels. Wheeled items such as but not limited to wheelchairs would utilize this system in order to make travel with them easier, such as carts and dollies.

[0036] The system ensures accessibility with multiple types of wheelchairs and is independently operated by the person once properly positioned to use the device. The user positions the back of their wheelchair against the push panel, which has a protruding curve in order to prevent the chair from separating from the panel during travel, before activating the system with a button. This button enables the motor to run, powering a geared drive shaft to rotate the slotted track and propel the user to the other end of the rail. The end of the rail is specifically located at a safe, level location where the user can safely continue moving along the paved pathway on their own after use of the rail system.

[0037] With reference to **FIG. 1** and **FIG. 2**, in an embodiment of the present invention, shows a representation of the possible main configuration for the conveyor system. A conveyor **2** is built upon several support poles **4** which bear pulleys **6** capable of tension adjustment. Mounted on these pulleys is a flexible, slotted plastic track **8** which is also connected to a motor system **10** via a gear **18** attached to a driveshaft **16** which provides the rotational mechanical energy to

run the conveyor system **2**. An ergonomic push panel **22** is attached to the slotted track **8** in order to push the user's wheelchair, cart or other wheeled device during operation. The support poles **4** may be made of any suitable, rigid material for outdoor use and should be a proper height such that the system aligns with the average mid back height of a typical wheelchair. Suitable materials are painted metal, plastic, coated fiberglass or carbon fiber.

[0038] As shown in **FIG.1** the motor system **10** consists of an appropriate housing **12** which contains a reversible, relay controlled electric motor **14** to be connected to a local power source. This motor **14** is connected to a driveshaft **16** that protrudes from the housing and is attached to a gear **18** that interacts with the slotted track **8** of the conveyor system **2**. The motor **14** provides power to the track **8** and panel **22** to push the user to the end of the conveyor system. The distance to travel is programmed into motor **14**. The motor **14** then stops for a reasonable amount of time, so the user may dismount the system, before reversing and returning the panel **22** to the starting position. Activation of the motor is performed by a button on an exterior input panel **20** to be pressed by the user.

[0039] In reference to **FIG. 3** the ergonomic push panel **22** is attached to the conveyor track **8** via a hinged clamp attachment **24** connected to the panel **22** via a permanently installed bracket **26**. The clamp **28** itself is shaped in such a manner to tightly fit to the edges of the track so the panel **22** can be easily replaced, but can push loads up to 400lbs without dislodging. The hinged clamp

attachment **24** allows for the ergonomic push panel **22** to fold against the track **8** when not in use. This ensures the conveyor system **2** does not occupy any portion of the path it is installed next to when not being used.

[0040] In reference to **FIG. 2** an overhead view of the conveyor system **2** is shown with two optional attachments. A lever activated exit gate **30** and an exterior activation button **38**. The exit gate **30** is activated when the user of the conveyor system **2** moves away from the push panel **22** after arriving at the end of the track **8** and travels over an activation lever **32** in front of a swinging gate **34** which allows the gate **34** to rotate out of the users way. Once the user has passed the lever **32**, the connection mechanism **36** allows the gate to reset via spring power.

[0041] The exterior activation button **38** is a secondary method to activate the conveyor system **2** for caregivers of wheelchair bound users with limited arm function, or for users who are using the system to move items such as wheeled carts. This extra button **38** allows these users to activate the system without needing to be in the way of the user or cart being pushed. The exterior activation button **38** is to be located on the back of the motor system housing **12** and activates the motor **14** identically to the normal activation button **20**.

[0042] Although the present invention has been described with reference to specific embodiments, it is understood that modifications and variations of the present invention are possible without departing from the scope of the invention,

which is defined by the claims set forth below. Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary knowledge in the art to which this invention belongs. Any methods and materials similar or equivalent to those described herein can also be used in the practice or testing of the present invention; however, the preferred methods and materials are now described.

CLAIMS

The invention claimed is:

1. A mechanized conveyor system comprising:
 - A mechanically powered track assembly installed alongside established pathways whereby the track allows the user to move up difficult roots; comprised of a slotted track; and
 - a geared drive shaft to rotate the track; and
 - a housing for the motor; and
 - a reversible relay-controlled electric motor to crank the geared drive shaft programmed to rotate a set number of times according to the length of the conveyor track; and
 - pulleys borne by support poles; and
 - support poles made of a suitable rigid material whereupon the conveyor track is built; and
 - A foldable ergonomic panel attachment to interface with wheeled transportation including, but not limited to, mobility platforms such as wheelchairs; and
 - User input controls to initiate the motor; and
 - A swinging gate which closes via a spring.
2. The mechanized conveyor system of Claim 1 further comprising of a flip gate exit system powered by a lever whereby a secondary user activates the system.

3. The mechanized conveyor system of Claim 1 further comprising an additional input located at the back of the motor housing for activation if reversible relay motor.
4. The mechanized conveyor system of Claim 1 further comprising an ergonomic push panel attached to the track assembly fitted with a hinged clamp allowing the panel to fold when not in use.

ABSTRACT

The conveyor assisted rail for wheelchair travel of the present invention allows wheelchair-bound persons to traverse paved inclines and long stretches of paths that may be difficult, laborious or impossible for them to travel normally. The conveyor system is installed along existing paths and comprises at least of; an ergonomic push panel attachment, user inputs, and a mechanized track assembly. Optionally, a pressure activated flip gate exit system and additional caregiver accessible activation panel may be added to the system. The system functions by the user positioning their wheelchair in line with the push panel and activating the conveyor. The conveyor will then push the user at a brisk but safe speed along the rail to the system's destination point, then later retracts the panel to the origin point for use by the next user.

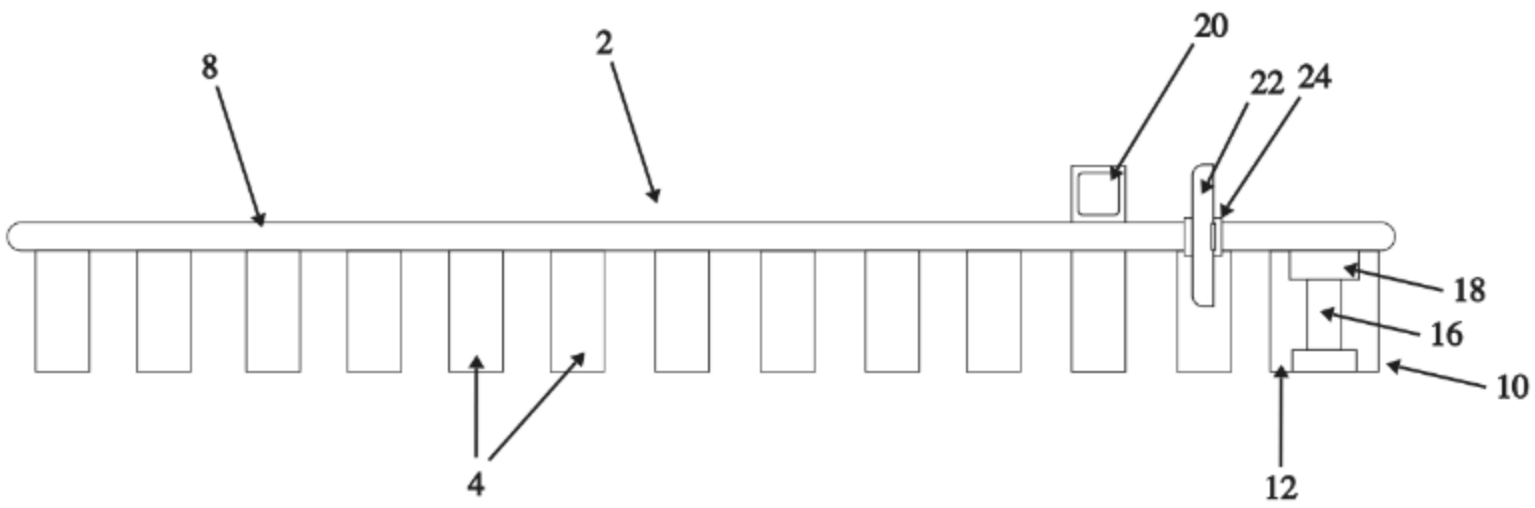


FIG. 1

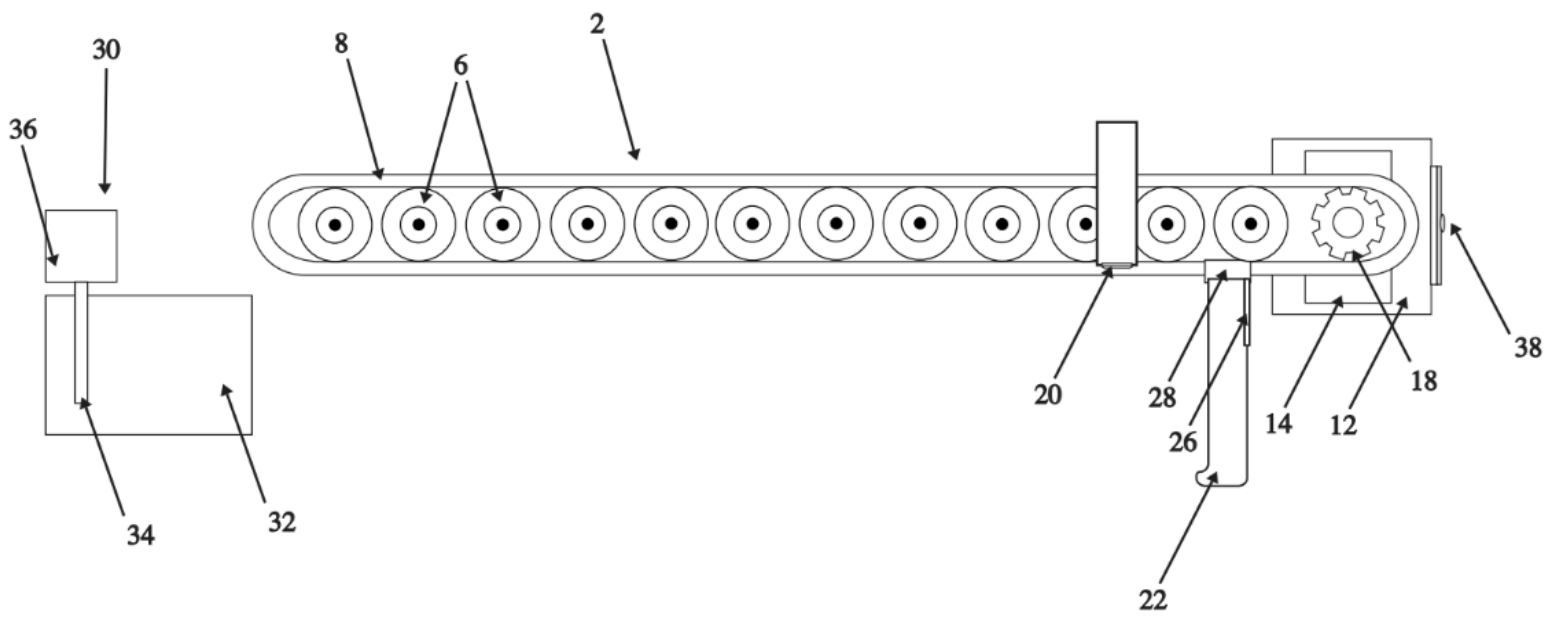


FIG. 2

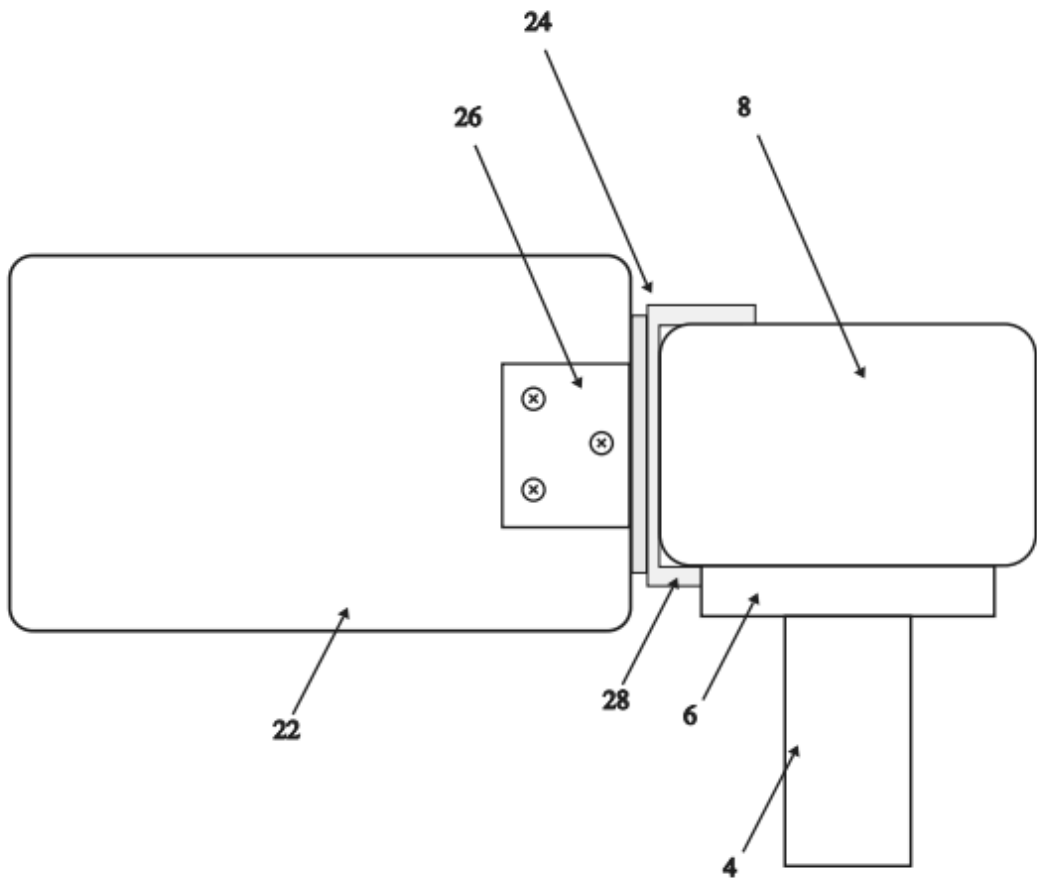


FIG. 3