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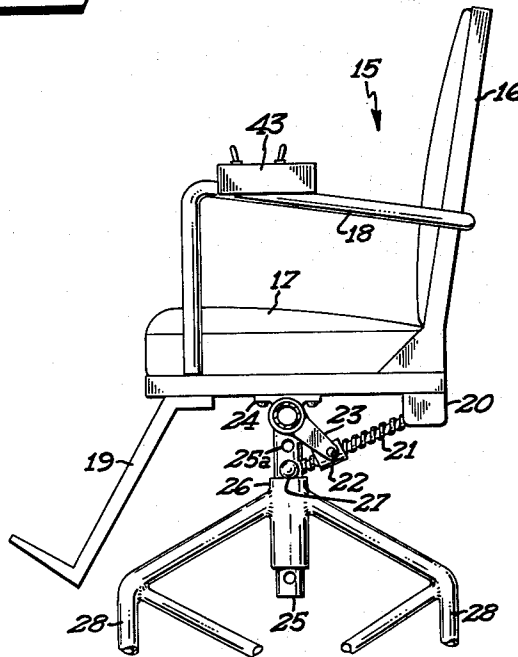
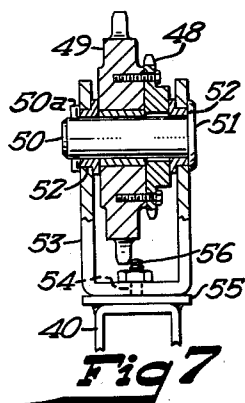
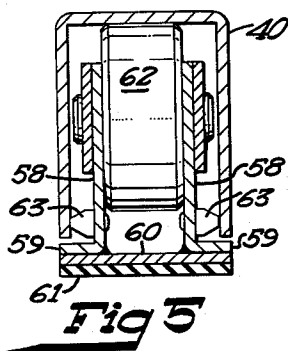
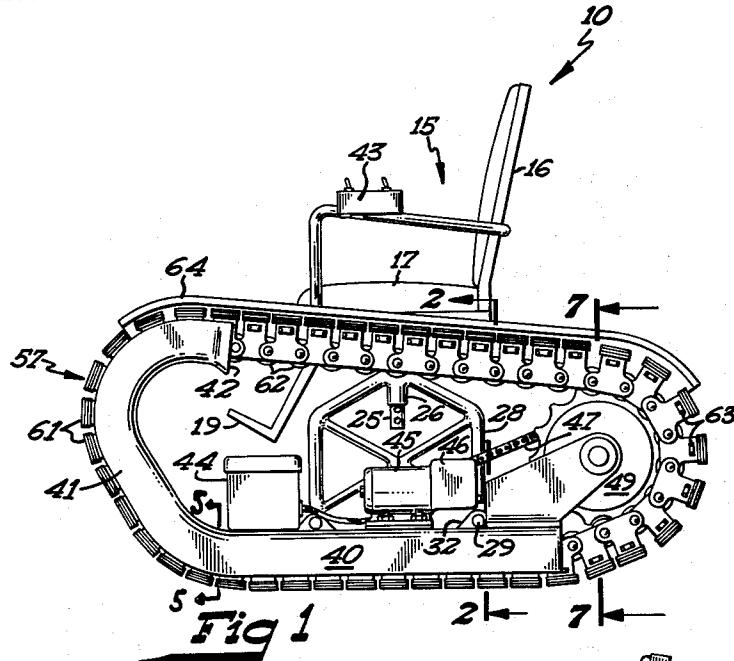
W. R. MAIJALA

3,259,200

FOLDING SELF-PROPELLED INVALID CHAIR

Filed April 26, 1965

2 Sheets-Sheet 1



INVENTOR.
WILLIAM R. MAIJALA
BY *William R. Maijala*

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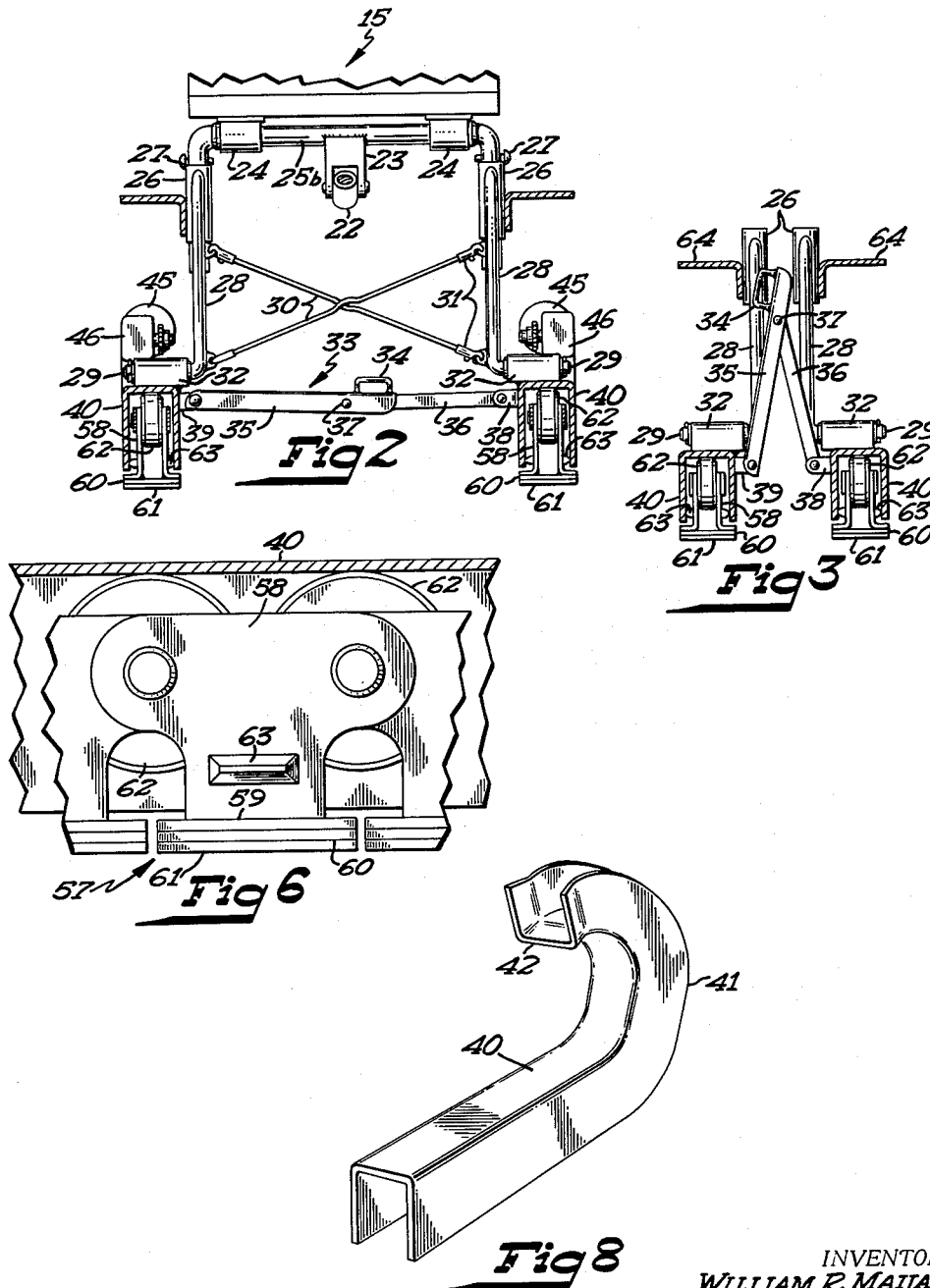
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FOLDING SELF-PROPELLED INVALID CHAIR

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2 Sheets-Sheet 2



INVENTOR.
WILLIAM R. MAIJALA
BY *William R. Majala*

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3,259,200
FOLDING SELF-PROPELLED INVALID CHAIR
William Rudolph Majjala, 4029 Xenia Ave. N.,
Robbinsdale, Minn.
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3 Claims. (Cl. 180-9.24)

This application is a continuation-in-part of my earlier filed copending application Serial No. 215,750, filed August 8, 1962, now abandoned.

The present invention relates to a motor-driven invalid chair or like vehicle.

The chair of this invention is equipped with a pair of independently driven endless traction belts which provide the means for moving or propelling the chair over the ground as well as ascending or descending a stairway or like inclined surface. The belts are guided and supported in a pair of identical U-shaped channel members attached to separate side frames. Each belt has pivotally connected links carrying rollers which cooperate with the U-shaped channel members. Separate motors are used to drive each belt. The pair of U-shaped channel members are easily spread out by two pivotally supporting members which are locked with the side frames to a width equal to a full size chair. The supporting members comprise a pair of removable cross X braces that snap on and off the side frames. A drop in and out adjustable seat assembly is mounted on a transverse cross member removably connected to the side frames. This structure permits the chair to be laterally folded into a small package so that the chair will fit into a car enabling an invalid to travel.

In the drawing:

FIGURE 1 is a side elevational view of the device in normal position for travel on level surface, with the track drawn to a larger scale;

FIGURE 2 is a fragmentary sectional view as taken along lines 2-2 of FIGURE 1;

FIGURE 3 is a view similar to FIGURE 2 with the seat removed and the chair folded;

FIGURE 4 is a side elevational view of the seat portion with the support structure partially broken away;

FIGURE 5 is an enlarged sectional view taken along lines 5-5 of FIGURE 1;

FIGURE 6 is a fragmentary elevational view partly in section of the track and chain;

FIGURE 7 is a sectional view of the sprocket assembly with the chain omitted taken along lines 7-7 of FIGURE 1; and

FIGURE 8 is a perspective view of the track guide channel member.

Referring to FIGURES 1 and 2 of the drawing, the device or vehicle, indicated generally at 10, has a seat 15 and a pair of endless tracks 57 located on opposite sides of the seat. The tracks 57 are supported in a pair of laterally spaced and longitudinal extended channel members 40. Upright A-shaped side frames 28 are attached to each channel member 40. A pair of snap on and off cross X braces 30 extend from lower rear eyelets and cross over to top eyelets on the top inside of the opposite side frames holding each side frame vertical in place. Snaps 31 are secured to opposite ends of braces 30. An over center locking device indicated generally at 33 extends transversely between channel members 40 and cooperates with braces 30 to hold the channels 40 apart.

Outwardly projected lower ends or portions 29 of each said side frame 28 connected into eyelets 32 are secured to the top of track channels 40. Each side frame 28 has upright seat height adjustment sleeves 26 receiving downwardly directed legs or stems 25 and 25a of transverse cross member 25b. The stems 25 and 25a telescope into the sleeves 26 making the cross member removable from

the side frames. Each stem has a plurality of transverse holes used to accommodate a height adjustment pin 27.

A seat portion indicated generally at 15 having an upright back rest 16, a bottom 17, arm rests 18 and a foot rest 19 attached to the front of bottom 17. Seat 15 is hingedly connected to cross member 25b by two tubular brackets 24 telescoped over transverse cross member 25b. To provide seat 15 with pivotal adjustment about the axis of member 25b and to hold seat 15 in a fixed position the seat is anchored with an adjustable mechanism connected to a motor means. The motor means comprises a reversible motor 20 secured to the bottom rear section of seat 15 as shown in FIGURE 4. The adjustable mechanism comprises a driven screw or worm 21 connected to motor 20 and threaded through a nut 22 pivotally mounted on a bracket secured to the mid-section of cross member 25b. As shown in FIGURES 2 and 4, bracket 23 projects downwardly and rearwardly from cross member 25b terminating in a bifurcated end located on opposite sides of nut 22. Motor 20 is connectable with battery 44 by a switch located in control panel 43 mounted on one of the arm rests 18 of seat 15.

In use motor 20 can be selectively driven in a forward and a reverse direction to drive worm 21 in opposite directions to tilt seat 15 forward or backward as may be required in descending or ascending an incline such as a stairway. Control panel 43 has separate manual controls for seat motor 20 and two drive motors 45. These controls are used to connect and disconnect the motors and the power supply 44, as storage batteries. Seat 15 being pivotally mounted on transverse cross member 25b will be pivoted forward and backward in response to the resulting actuation of worm 21 relative to swivel nut 22 mounted on bracket 23.

As shown in FIGURES 2 and 3, the over center locking device 33 comprises a pair of channel or U-members 35 and 36, hingedly connected to pivot brackets 38 and 39 projected inwardly from channel members 40. A pin 37 projects through overlapped sections of members 35 and 36 pivotally connecting the members to each other for folding and spreading the channel members 40. A handle 34 on top of member 35 provides a convenient hand grip usable to move the locking device 33 to the folded position shown in FIGURE 3 and to the locked position shown in FIGURE 2.

The U-shaped channel members 40 are identical and are located generally parallel to each other. Each member 40 has outwardly projected flanges providing a guideway for an endless track indicated generally at 57, in FIGURE 1. The forward section 41 of member 40 projects upwardly and forwardly terminating in a rearwardly curved end 42. Section 41 has a vertical height greater than a normal stairway step. As shown in FIGURE 8, the side flanges and base of end 42 are bent outwardly forming a track entrance.

Each track 57 comprises a plurality of pivotally connected links carrying rollers 62. Each link has spaced side plates having outwardly turned side flanges 59 secured to a cross plate 60. A rubber pad 61 is secured to the outside face of plate 60. Rollers 62 are located between side plates 58 and are rotatably mounted on pins used to pivotally connect adjacent links. Rollers 62 may be formed of plastic material, as nylon, and project inwardly from the links so as to roll on the base of channel member 40.

As shown in FIGURES 5 and 6, wear pads 63 are secured to opposite outer sides of side plates 58. Wear pads 63 may be made of plastic material, as nylon, and in use engage the inside faces of the flanges of channel member 40 to centralize the track in the guideway of the channel member.

Separate electric motors 45 are used to drive endless tracks 57. Each motor 45 is supported on top of member 40 and is coupled to a gear box 46 having a drive sprocket. A roller link chain 47 is trained about drive sprockets and a driven sprocket 48 mounted on a track sprocket 49. As shown in FIGURE 7, bearings 52 mounted on a U-shaped sprocket bracket 53 support a transverse pin or axle 50. A pin 50a and axle head 51 retain the axle in assembled relation with the bracket. Axle 50 projects axially through sprockets 48 and 49 rotatably mounting these sprockets on bracket 53. The rollers 62 of track 57 engage sprocket 49. The sprocket bracket 53 is secured to a plate 55 by bolts 56. Plate 55 is secured to the top of channel member 40. Sprocket bracket 53 has slotted holes 54 for bolts 56 enabling the bracket 53 to be moved backward and forward to adjust the tension on track 57.

In use, the motors 45 are supplied with power from storage batteries 44 mounted on track channel members 40.

Controls on the control panel 43 are manually operated to either connect or disconnect the batteries and the motors. When motors 45 are energized power is transmitted to the gear boxes which operate link chains 47. This rotates the sprockets 48 and 49 driving the tracks 57.

What is claimed is:

1. In a chair, the combination of frame means, endless track means mounted on the frame means on opposite sides of said chair, a transverse cross member attached to said frame means, a seat pivotally mounted on said transverse cross member, a threaded nut attached to said cross member, a motor attached to said seat said motor connected to a threaded shaft threaded in said nut whereby said seat may be tilted about said transverse cross member in response to actuation of said motor means

for removably connecting opposite ends of the transverse cross member to said frame means whereby the seat and cross member can be removed from the frame means and endless track means.

2. In a motor driven chair: an endless track having a top run and a bottom run, frame means comprising a U-shaped supporting channel member extended along the bottom run of said track, the forward end of the channel member curved upwardly and rearwardly beneath the upper run of said track, said endless track comprising pivotally connected links and at least one roller mounted on each of said links centrally thereof and adapted to roll in said channel member, said links having wear pad means on opposite sides thereof for engagement with opposing sides of said channel member.

3. The chair defined in claim 2 wherein each of said links have side plates disposed on opposite sides of the roller, and means pivotally mounting the roller on the side plates.

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BENJAMIN HERSH, *Primary Examiner.*

A. HARRY LEVY, LEO FRIAGLIA, *Examiners.*

R. J. JOHNSON, *Assistant Examiner.*