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OCCUPANT-PROPELLED WHEELCHAIR

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FIG. 2

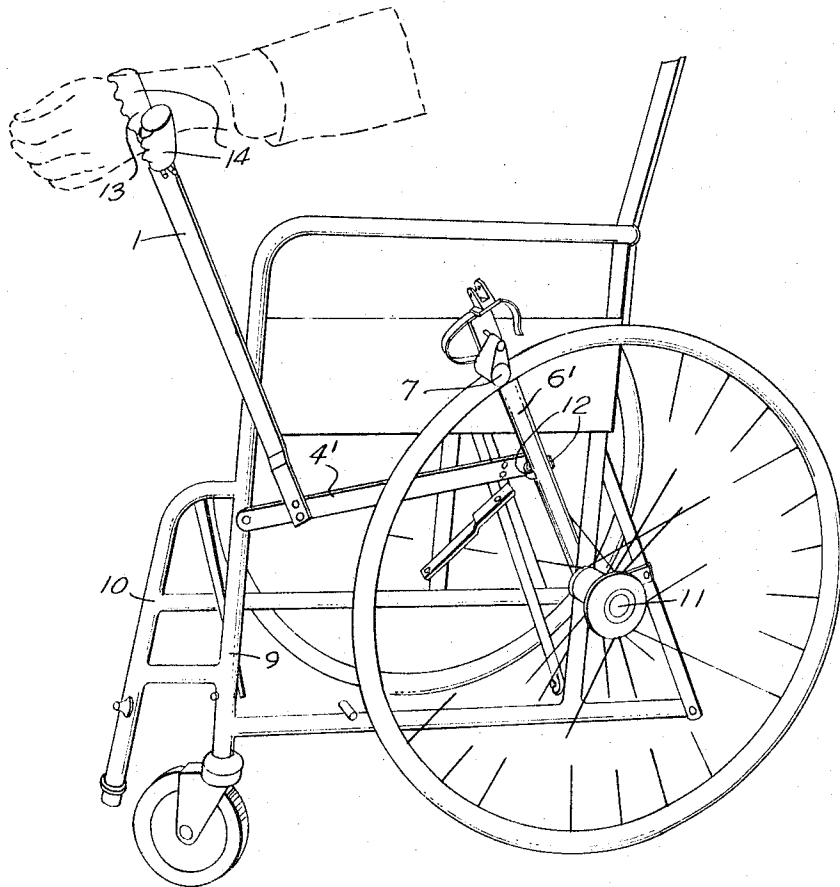
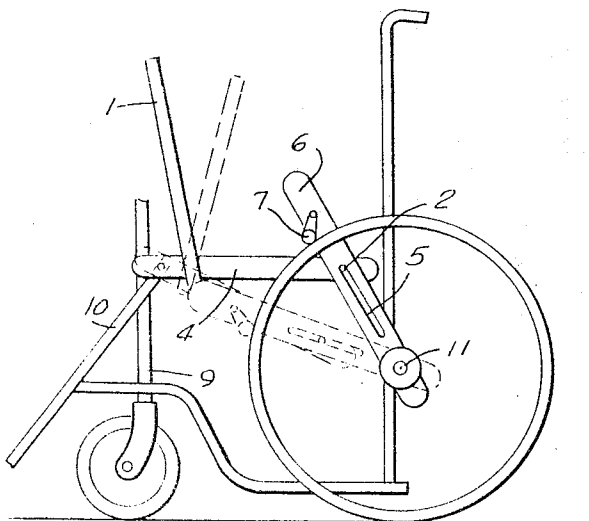


FIG. 1



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OCCUPANT-PROPELLED WHEELCHAIR

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5 Claims. (Cl. 280-242)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to wheelchairs and in particular to a driving mechanism which can be operated by the occupants of such chairs. Specifically the driving mechanism involves the use of a unique linkage arrangement whereby the occupant of the wheelchair can propel himself by applying a force in a direction opposite to the direction of travel.

In the past wheelchair drive arrangements have been used to provide the patient with a means of propelling himself without gripping the wheel or its rim. Such systems included an actuating lever pivotally mounted upon the axle coacting with a drive dog arrangement. By gripping the actuating lever and applying force thereto, a patient could propel himself. To the incapacitated patient incapable of reaching for the actuating lever, incapable of applying a gripping force to the lever, or both, this simple lever system was useless. This invention overcomes these difficulties by means of a linkage arrangements.

The object of this invention is to provide a linkage arrangement which translates a horizontal force applied by a patient into a force upon the wheel of a wheelchair in order to propel the wheelchair.

Another object is to provide an arrangement which allows an incapacitated person to propel a wheelchair in any direction by applying a horizontal force to a linkage connected to a drive bar.

Other objects will become apparent upon reading the specification and upon reference to the following drawings in which:

FIG. 1 shows one embodiment of the linkage arrangement for the drive mechanism, and the effect of activating the drive mechanism; and

FIG. 2 shows another embodiment of the linkage arrangement.

In order to propel himself in a forward direction the occupant applies a force to a propelling bar 1 in a rearward direction as shown in FIG. 1. As the force is applied toward the occupant of the wheelchair the center pin 2 attached to the horizontal member 4 is forced in a generally downward direction along an elongated aperture 5 located along the longitudinal axis of the drive bar member 6. This downward force transmitted to the drive bar member 6 causes a reversible drive dog 7 mounted upon the drive bar member 6, to drive the wheel and chair in a forward direction.

The structure of this propelling linkage involves a propelling bar 1 rigidly attached to a horizontal member 4. The horizontal member 4 is pivotally mounted upon any appropriate support structure of the wheelchair. For example, this horizontal member 4 could be pivotally mounted upon the wheelchair leg 9 or upon the upright support structure for the wheelchair foot rest 10. A center pin 2 is mounted upon the horizontal member 4. A drive bar member 6 having an elongated slot 5 along its longitudinal axis is pivotally mounted upon the wheelchair axle as shown at point 11 of FIG. 1. A reversible drive dog 7 is pivotally mounted upon the drive bar member 6 at an appropriate position as to come into contact with the wheel of the chair.

FIG. 2 shows another embodiment. A sliding clamp arrangement can be used in lieu of the center pin and elongated aperture combination. In this arrangement a sliding clamp 12 mounted upon the horizontal member 4

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engages the drive bar member 6' thereby allowing the drive bar member to slide within the confines of the clamp. The elongated slot 5 is not necessary in this arrangement.

Quite often the occupant of the wheelchair cannot firmly grasp the propelling bar 1 to transmit a rearward pulling force, which is translated into a forward force on the wheels. A Y-member 13 attached to the upper end of the propelling bar 1 allows the patient to impose a rearward pulling force upon the propelling bar by placing his wrist between the cradle of the Y-member. With this arrangement the patient need not have to grasp the propelling bar. In order to afford the patient more comfort in using the Y-member arrangement and also to improve the adhesive characteristics of the Y-member, handle grips 14 are placed about the ears of the Y-member.

This propelling arrangement also uses reversible dogs 7. This allows the patient to cause either a rearward motion or forward motion to the wheels. Thus this invention allows the occupant of a wheelchair to propel himself about freely in all directions with a minimum amount of manual effort.

Both embodiments afford the patient the capability of maneuvering the chair in all directions. To move backward the patient applies a forward pushing force to the propelling bar 1. The linkage arrangement then would react to engage the drive dog against the wheel as to transmit a rearward force against the wheel. By providing this linkage arrangement for both wheels, and by selectively varying the force applied to the propelling bar the patient now has the capability of total mobility in all directions.

I claim:

1. A device to be mounted upon the axle and support structure of a wheelchair allowing an incapacitated person to apply force to the wheel of a wheelchair comprising:

- (a) a horizontal member mounted upon the wheelchair support structure;
- (b) a center pin mounted upon the horizontal member;
- (c) a propelling bar attached to the horizontal member to which the incapacitated person applies a force;
- (d) a drive bar member having an elongated aperture along its longitudinal axis for engaging said center pin and allowing said center pin to travel generally downward, and having a pivotal mounting aperture at its lower end for mounting the drive bar member upon the axle of the wheelchair; and
- (e) a reversible dog mounted upon said drive bar member and coming into contact with the wheel of the chair to transmit the applied force to the wheel.

2. The device as defined in claim 1 further comprising a Y-member attached to the end of said propelling bar to allow the incapacitated person to apply a force to the propelling bar without gripping said propelling bar.

3. A device to be mounted upon the axle and support structure of a wheelchair allowing an incapacitated person to apply force to the wheel of a wheelchair comprising:

- (a) a horizontal member having means for pivotally mounting said member to the support structure of the wheelchair;
- (b) a drive bar member having means for pivotally mounting said drive bar member to the axle of the wheelchair;
- (c) means for engaging said drive bar member, mounted upon said horizontal member to transmit a force upon said drive bar member;
- (d) means for transmitting a force from said drive bar member to the wheel of the chair, mounted upon said drive bar member; and
- (e) a propelling bar connected to the horizontal member upon which an incapacitated person applies a force.

4. The device as described in claim 3 wherein the means for engaging said drive bar member comprises a clamp mounted upon the horizontal member to allow the drive bar member to slide within said clamp.

5. The device as set forth in claim 3 further comprising a Y-member attached to the end of said propelling bar to allow the incapacitated person to apply a force to the propelling bar without gripping said propelling bar.

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KENNETH H. BETTS, *Primary Examiner.*