BRAKE STAND FOR WHEELCHAIRS

An attachment for wheelchairs in the form of a brake attachment or a brake stand. In the preferred form the brake stand is in the form of a frame attachment used between side frame members of the wheelchair. It adjustably attaches to vertical frame members of the chair in adjustably latched positions with biasing means biasing the stand in an upward direction. The brake stand can be moved into a lowered position to engage the floor or other surface lifting the main wheels of the chair off the floor and holding the chair in the stabilized or brake position. Simplified forms of the attachment means are provided to be adjustably positioned to lift and hold the chair in an upward position with the main wheels off the floor. The stand may be quickly released by attendants or others to allow normal movement of the wheelchair.

7 Claims, 13 Drawing Figures
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BRAKE STAND FOR WHEELCHAIRS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The field of the invention is that of an attachment means for wheelchairs which may be chairs of typical construction the attachment means being in the form of an attachment capable of being moved to an adjusted position to engage the floor and hold the main wheels of the chair lifted so that the chair is braked or held firmly stabilized for safety.

2. Description of the Prior Art

The attachment of the invention may be used with various types of conventionally known wheelchairs which are of known construction. One particular type of known wheelchair is described in detail hereinafter. Typically wheelchairs are provided with two large floor engaging wheels and a pair of smaller front caster wheels. All wheels are attached to a frame which may be of tubular construction supporting a seat and a back for the patient. Typically wheelchairs are provided with a hand brake with brake shoes that engage the main rails for holding the chair in stabilized position. Alternatively, for certain patients who, for mental reasons must be restrained in the wheelchair by, for example, tying the patient therein to prevent the patient from deliberately moving the chair in unauthorized locations, it has been the practice to be tie or otherwise secure the wheelchair to walls, posts or other fixed structures. Such restraint of the wheelchair itself is generally unsatisfactory to fire officials for obvious safety reasons since an orderly or other attendant would have to take time to release the chair in case of emergency. Therefore, such prior restraining means did not necessarily provide the required degree of safety such as may be required by fire regulations in hospitals or otherwise.

SUMMARY OF THE INVENTION

The herein invention provides an attachment which can be readily used with or attached to wheelchairs of known construction to provide additional positive braking by way of a stand or holding member positionable to engage the floor or other surface to provide positive braking or holding means for the chair to provide assured safety against any undesired movement of the chair and to give assurance that any and all regulations, no matter how rigid, are met, and to allow quick release of the chair in the event of emergencies. The attachment means as referred to is novel and unique and differs from and is beyond any presently known braking means or devices available for use with wheelchairs.

In light of the foregoing the primary object of the invention is to realize a simplified means or device as referred to capable of providing positive braking and particularly by way of a braking stand to positively hold a wheel chair in position with the main wheels lifted.

A further object is to realize the ultimate in safety by way of attachment means as referred to which acts to lift the main wheels of the chair from the floor and to engage the floor to positively ensure against movement of the chair and yet allow quick release thereof.

A further object resides in the realization of making available a device as referred to which is easily and readily attachable to existing chairs and non-operable by the patient.

Yet a further object resides in the realization of the braking device or stand which is simple to fabricate, which is economical, which is easy to install, use and operate.

BRIEF DESCRIPTION OF THE DRAWING

Further objects and additional advantages of the invention will become apparent from the following drawings and detailed description wherein:

FIG. 1 is a side view of a typical chair having the attachment or appliance of the invention embodied therein;

FIG. 2 is a rear view of the chair of FIG. 1;

FIG. 3 is a perspective view of a preferred form of brake stand as utilized in FIGS. 1 and 2;

FIG. 4 is a perspective view of a preferred form of the brake stand including the tubular telescope spring biased members that are attachable to frame members of the chair;

FIG. 5 is a detailed sectional view of one of the assemblies of telescoping tubes showing the manually actuable spring detents for latching the tubes together in adjusted positions;

FIG. 6 is a side view of a chair having embodied therein a modified form of the invention;

FIG. 7 is a perspective view of a brake stand utilized in the modified form of the invention;

FIG. 8 is a partial view of one of the tubular chair frame members in which an upright of the brake stand is telescoped;

FIG. 9 is a partial plan view of the lower part of a chair having a modified form of brake stand embodied in it;

FIG. 10 is a detailed view of the attachment means providing the brake stand in this modified form of the invention;

FIG. 11 is a detailed view of the brake stand of FIGS. 9 and 10 illustrating angular adjusted positions;

FIG. 12 is a partial schematic view of a chair embodying another form of the invention wherein brake stand attachment members are telescoped into frame members of the chair;

FIG. 13 is a detailed view of one of the brake stand members of FIG. 12.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1-5 illustrate the preferred embodiment of the invention. FIGS. 1 and 2 show a typical wheelchair having the preferred embodiment of the invention incorporated therein.

The chair of FIGS. 1 and 2 is of typical conventional construction. FIG. 1 shows one of the side frames which includes an upright column or forward frame member 10 and a rear upright frame member 12 having a rearwardly turned handlebar 13 at the upper end. Numerical 14 designates a transverse lower frame member extending between the vertical frame members 10 and 12. Numerical 16 designates a transverse frame member at the top extending between the vertical frame members 10 and 12. On the other side of the chair there is a similar side frame composed of similar frame members identified by similar reference characters primed.

Between the side frames of the chair there is a seat 20 suitably supported and it may be of a fabric material and supporting a cushion. Referring to FIG. 1 the numeral 22 designates a side member which may be a metal or fabric panel forming a side of the seat there being a similar panel member at the opposite side of the
The back of the chair is designated at 24 in FIG. 2 suitably secured to the upright or vertical frame members 12 and 12' and it may be rigid or made of a fabric material.

Numeral 26 designates an arm rest carried on the corresponding transverse frame member at the opposite side of the chair.

The vertical frame member 10 extends downwardly from the transverse frame member 13 as designated at 30 and journaled on it is a bushing or a bearing 32 forming a swivel caster the bushing having a yoke part 33 in which is journaled the shaft of caster wheel 34. A similar caster wheel assembly is provided on the other side of the chair.

The chair is provided with two main wheels as designated at 40 and 40' which in a typical construction are wire spoke wheels having tires thereon. The axe of wheel 40 is designated at 42 and it is welded to the top right frame member 12 as shown. The other wheel 40' is similarly mounted. Secured to the wheel 40 is hand wheel rim 44 which is of smaller diameter and which is secured to the wheel 40 adjacent its periphery by suitable securing means such as bolts. Similar hand wheel rim 44' is provided secured to the wheel 40' these hand wheels or hand rims being for purposes of the patient to manually rotate the main wheels for moving the chair about.

Numeral 50 designates a tubular X-frame formed by two tubular members welded together at their center the corners or ends of the X-frame members being welded at spaced points as shown on the vertical frame member 12 and 12' so as to provide rigidity of the wheelchair frame as a whole. The upper ends of the end frame members 50 are at a level below the seat 20 as shown.

A preferred form of braking attachment or brake stand attachment is shown in detail in FIGS. 3, 4 and 5. FIGS. 1 and 2 illustrating how the attachment is applied to or utilized with the wheelchair. As may be seen in FIGS. 3 and 4 the braking attachment or braking stand comprises a frame structure 60 comprising longitudinal tubular members 61 and 61' having angular foot portions as designated at 62 and 63 and 62' and 63'. These members are parallel and are attached by transverse member 64 which is tubular having an intermediate telescoping tubular part 65 providing for a lateral adjustment that is for width so that the stand can be adapted to chairs of different widths.

Upstanding from the frame member 61 is a vertical tubular member 70 there being a corresponding member 70' upstanding from the tubular member 61'. Telescoped over the tubular member 70 is a telescoping tube 74 and numeral 74' designates a similar telescoping tube telescoped over the member 70'. Each of the members 74 and 74' have vertically aligned apertures or holes in them as will be referred to more in detail presently. The tubular member 74 has an extending lug 76 and the tubular member 74' has a similar extending lug 76' each of these lugs having a hole in it. By way of these lugs with the holes or apertures these tubular members are attached to the chair by being bolted to the upright members 12 and 12' as may be seen in FIGS. 1 and 2.

Spring biasing means are provided which normally urge the brake stand upwardly with respect to the chair itself in order to provide the quick release feature designated. Numeral 80 designates a coil spring within the tubular member 74 being attached at one end to the upper end of this tubular member with the other end of the spring attached to the column member 70. Numeral 80' designates a similar coil spring within the tubular member 74 and attached to the upper end of this member with the other end of the spring attached to the upper end of column member 70 so that as can be seen the brake stand assembly is normally urged upwardly with respect to the chair.

The brake stand assembly can be latched in various vertical adjusted positions as will be described in detail presently. The brake stand can be latched in a plurality of adjusted position by detent latches or detent latch means which are actuated by foot operated trigger lever in the form of the U-shaped member 84 which will be referred to again presently. The position of this foot operated lever can be seen in FIGS. 1 and 2.

FIG. 5 is a detailed sectional view of one of the detent latch assemblies being the one associated with the column 70 and telescoping tube 74. The tube 74 has in it axially aligned apertures one of which is designated at 90. Within the tube 70 is a spring finger 92 carrying a detent pin 94 which cooperates with the holes 90.

The spring 80 is held at the upper end by a disc 96 within the telescoping tube 74. On the tube 74 is a lug 100 to which is pivoted actuating lever 102, a part of U-shaped member 84, having abutments as designated at 104 on its inner edge spaced apart distances corresponding to the spacing of the holes 90. On the opposite side of the chair there is, of course, another similar actuating member 102', the lower ends of these members being connected by a transverse member 83 as may be seen in the figures. Thus the U-shaped member 84 can be swung about its pivot on opposite sides of the chair the movement being limited by clip or guide designated at 108.

With respect to the operation of the detent latching assembly as shown in FIG. 5 as may be seen when the lever member 102 is swung to the left, that is clockwise, one of the abutments 104 will engage the pin 94 disengaging it from a hole 90 to allow vertical axial movement of the tubular member 74 relative to the member 70 so that the detent pin 94 can then be allowed to engage in any one of the holes or apertures 90 in any adjusted position, the springs 80 and 80' causing the detent stand to be pulled upwardly when the detent latch means are released and until the desired adjusted position is reached at which time the detent latch pins are again reengaged. The clip or guide 108 may be in the form of a pair of U-bolts attached to the vertical columns 70 and 70'.

The wheelchair may be equipped with typical or conventional handbrakes that cooperate with the rubber tired wheels as may be seen in FIG. 1. The and brake as shown on the left side in FIG. 1 comprises a brake handle 110 pivoted at 111 with the brake shoe 112 at its end cooperable with the tire and the brake handle being setable in holding positions. A foot operated member may be provided for operating both of these brake mechanisms simultaneously.

From the foregoing those skilled in the art will readily understand the utilization and operation of the invention, that is, the attachment as described and shown in position in FIGS. 1 and 2. Normally the detent latching lever or trigger member 24 is in the up position. To release or disengage the detent latches the foot may be
applied to transverse member 83 to swing it or move it in a clockwise direction to disengage the detent pins as shown at 94 and as described in connection with FIG. 5. When the wheelchair is lifted upwardly by the handles, while the foot holds the frame 60 down by pressing on transverse member 64, until the desired height is reached, which may vary depending upon rug thickness and so on, and at the desired height the actuating bar member 84 is released so that the detent pins 94 re-engage in holes 90 at the appropriate level. At this time the frame 60 is below the level of the bottom periphery of the main wheels 40 and 40’ so that the chair is supported on the brake or brake stand with the main wheels above the surface but with the caster wheels such as shown at 34 still resting on the operating surface.

To release the brake stand the operating member or bar 84 is again foot actuated to release the detent latches with the springs 80 and 80’ automatically pulling the stand, that is the frame 60, upwardly to a released position so that the main wheels 40 and 40’ again rest on the floor or operating surface. The top holes in the tubular members 70 and 70’ are positioned to provide brake clearance. This provides the desired quick release feature.

FIGS. 6, 7 and 8 show a modified form of the invention wherein parts that correspond to and are like parts in the previous embodiment are identified by the same reference characters. The chair in FIG. 6 is like the chair of FIGS. 1 and 2, the right side of the chair being shown in FIG. 6. The essential difference between this embodiment and the previous embodiment is that the tubular members of the previous embodiment as identified at 74 and 74’ are omitted. The frame structure 60 is like that of the previous embodiment with upright column 70 and 70’. In FIGS. 6, 7, & 8 the upright members 70 and 70’ of frame assembly 60 are telescoped into the tubular frame members 12 and 12’ of the chair itself one of these frame members 12 being partially shown in FIG. 8. In other words the tubular frame members of the chair itself are utilized to have the upright columns 70 and 70’ of the stand 60 telescoped therein. The detent latching assembly utilized in FIGS. 6, 7, & 8 can then be like that described in connection with FIGS. 1–8.

FIGS. 9, 10 and 11 show a simplified form of attachment means attachable to a typical wheelchairs for providing braking or a braking stand. In this simplified form of the invention an attachment means is utilized as designated at 120 comprising a frame having the shape shown having side members 122 and 122’ joined at their ends by angular end parts 123 and 123’ and 125 and 125’. At the ends of the frame attaching means 120 are extending trunnions 126 and 127. This attachment means may be used either at the front or back of the wheelchair. As shown in FIG. 9 it is utilized at the front of the wheelchair. The lower side frame members 14 and 14’ are provided with journeled bearings 130 and 130’ in which are journeled the trunnions 126 and 127 so that the frame 120 can be angularly rotated between positions as illustrated in FIGS. 9 and 11. The frame 120 is rotatable to a position as illustrated so that one side of the frame engages the floor or other surface and it may be locked in that position with either the front wheels of the chair raised from the operating surface or in the event this attachment means is used at the rear of the chair the large main wheels would be lifted from the floor with the frame attachment engaging the floor and thus providing braking, holding and stabilizing means preventing the chair from moving, and yet may be easily swung to the retracted position to provide the desired quick release feature.

FIGS. 12 and 13 show another simplified form of the invention. The chair shown in FIG. 12 is like that of FIG. 1 the left side being shown. As may be seen in the lower longitudinal frame members 14 and 14’ extend rearwardly from the vertical frame members 12 and 12’ as designated at 15 and 15’. Normally rubber protective caps placed over the ends of these frame members which are hollow tubular members. In the form of the invention shown in FIGS. 12 and 13 these end caps are removed from the ends of the tubular members. Numerals 136 and 136’ designate tubular angle members these members being of a diameter so that an end part can be inserted and telescoped into the open ends of the extending tubular frame members 15 and 15’ as shown.

As may be seen the tubular angle members 136 and 136’ can be rotated within the frame members 15 and 15’ so that they have angle parts extending downwardly forming feet which can support the chair frame with the main wheels off the floor operating surface so that it is braked and stabilized and held in a fixed position.

The chair may be lowered so that the main wheels again rest on the operating surface merely by rotating the members 136 and 136’ angularly so that they disengage from the floor or operating surface and extend to the side or upwardly.

From the foregoing description of the construction, operation and utilization those skilled in the art will readily fully understand the nature of the invention and the manner in which all of the objects and advantages as set forth in the foregoing are realized as well as the many additional advantages that are apparent from the detailed description.

The foregoing disclosure is representative of preferred forms of the invention and is to be interpreted in an illustrative rather than a limiting sense the invention to be accorded the full scope of the claims appended thereto.

I claim:

1. A brake attachment for a wheelchair resting on a surface, said wheel chair of the type having a frame and seat and a pair of main wheels and a pair of forward wheels, said brake attachment means coupled to the frame of the wheel chair and adjustably moveable with respect thereto, said brake attachment means comprising:

a frame structure having:

a pair of transversely spaced longitudinal members, each having a forward end and a rear end spaced a preselected longitudinal distance from said forward end;

foot portions coupled to each of said forward ends and said rear ends of said longitudinal members;

latch means operatively interconnecting said brake attachment means and said wheel chair for selectively securing said brake attachment means to said wheel chair in a plurality of positions relative thereto, and in at least a first a said plurality of positions said foot portions are free of engagement with the surface upon which said wheel chair rests to allow said main wheels and said forward wheels to engage said surface to allow movement of said
7 wheel chair thereon, and in a second of said plurality positions said foot portions engage the surface to lift at least said main wheels free of engagement with the surface to prevent movement of said wheel chair thereon; trigger means operatively engaging said latch means to allow selective movement of said brake attachment means between said plurality of positions thereof.

2. The arrangement defined in claim 1 wherein:
   said pair of longitudinal members are substantially parallel;
   said forward ends of said longitudinal members are positioned forward of said main wheels and intermediate said main wheels and said forward wheels of said wheel chair; and
   said rear ends of said longitudinal members are positioned longitudinally spaced from said forward ends thereof and in back of said main wheels.

3. The arrangement defined in claim 2 wherein:
   one of said pair of longitudinal members are adjacent each of said main wheels.

4. The arrangement defined in claim 3 and further comprising:
a transverse member coupled to each of said longitudinal members for maintaining said transverse spacing therebetween;
a vertical member coupled to each of said longitudinal members and extending upwardly from toward said wheel chair;
said latch means further comprises:
each of said vertical members having a spring loaded pin means extending therefrom;
vertically aligned tubular members in which said vertical members are telescoped, and said vertically aligned tube members having a plurality of pin accepting apertures therethrough in a preselected vertically spaced array for receiving said pin means on said vertical members therein for supporting said brake attachment means in said plurality of positions.

5. The arrangement defined in claim 4 wherein:
said vertically aligned tubular members are pivotally mounted on said wheel chair for limited rotary motion with respect thereto;
said vertical members move into said plurality of positions with respect to said wheel chair in said vertically aligned tubular members in a substantially linear direction with respect to said vertically aligned tubular members, whereby each of said foot members and said forward wheels of said wheel chair engage the surface in said second of said plurality of positions.

6. The arrangement defined in claim 5 wherein:
said latch means selectively disengages said pin means from said pin accepting apertures in said vertically aligned tube members to allow movement of said frame structure between said plurality of positions thereof.

7. The arrangement defined in claim 4 wherein:
said vertically aligned tubular members are rigidly coupled to said frame of said wheel chair; and
said vertical members move reciprocatingly in vertical directions in said vertically aligned tubular members between said plurality of positions thereof.

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