United States Patent [19]

Pitts, Jr.

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[54] BRAKE STAND FOR WHEELCHAIRS

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[21] Appl. No.: **416,971**

[52] **U.S. Cl.** ..... **280/43.24**; 248/407; 280/242 WC; 280/293

[51] **Int. Cl.** **B60t 1/14**

[58] **Field of Search** ..... 280/43.24, 43.14, 289, 280/242 WC, 293; 188/5; 248/188.5, 407, 408, 409; 297/DIG. 4

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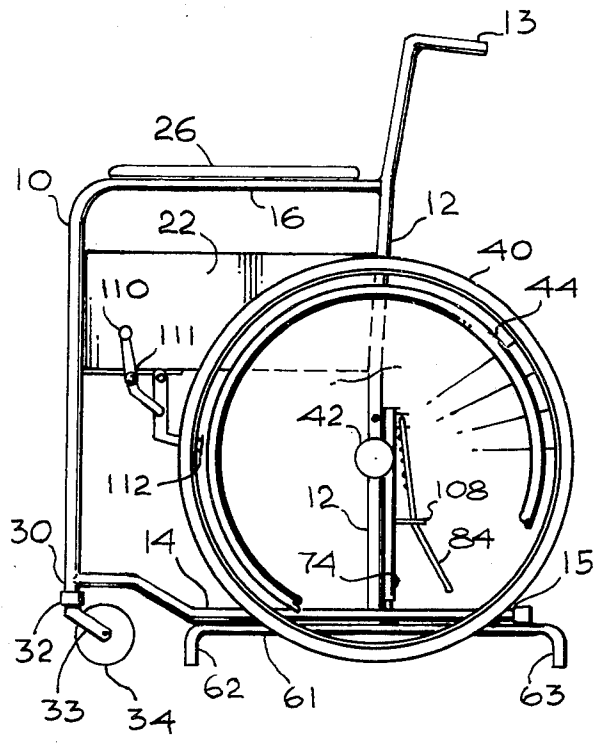
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Primary Examiner—Kenneth H. Betts
Attorney, Agent, or Firm—Don B. Finkelstein

[57] **ABSTRACT**

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



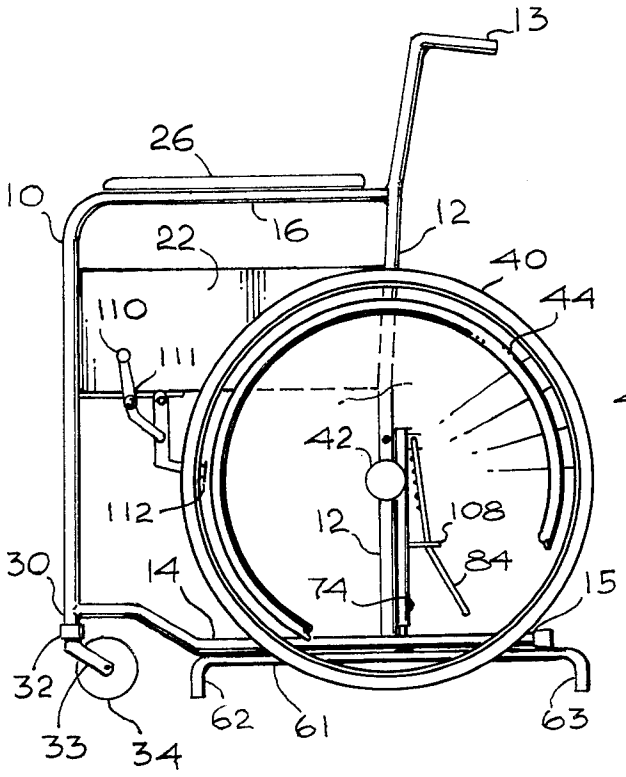


Fig. 1

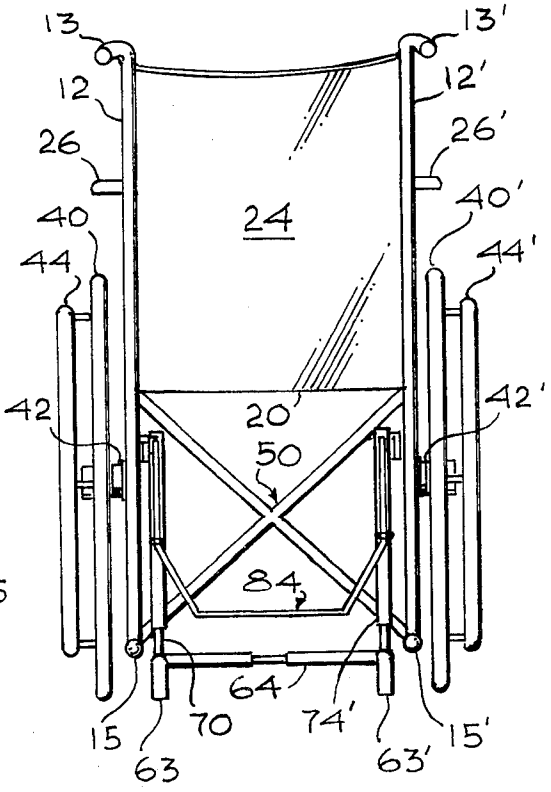


Fig. 2

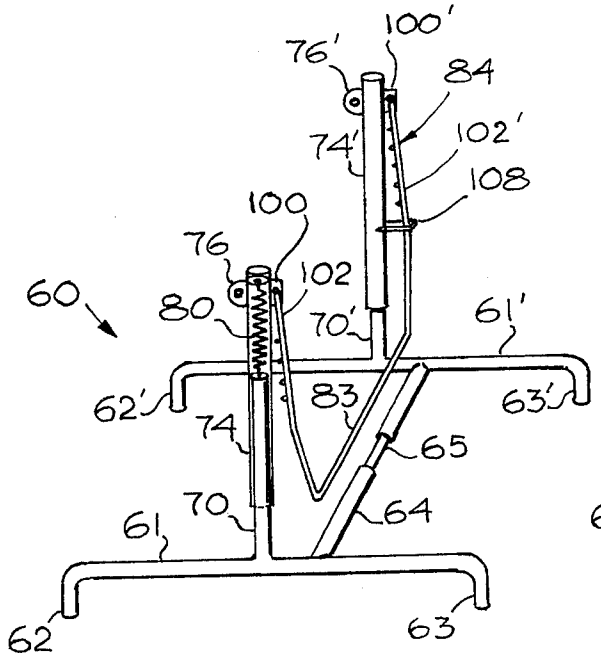


Fig. 4

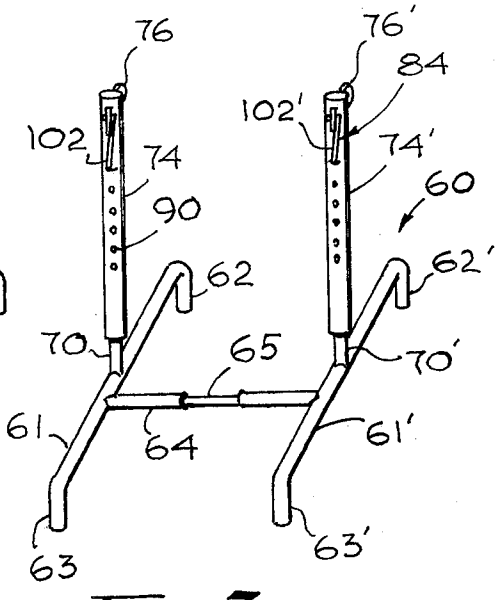


Fig. 3

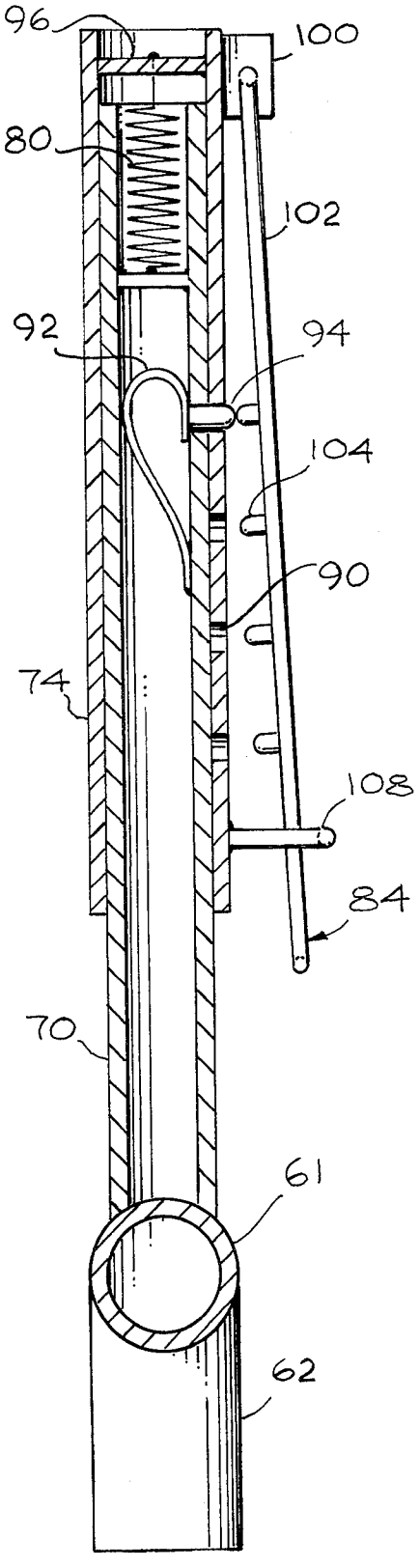


Fig. 5

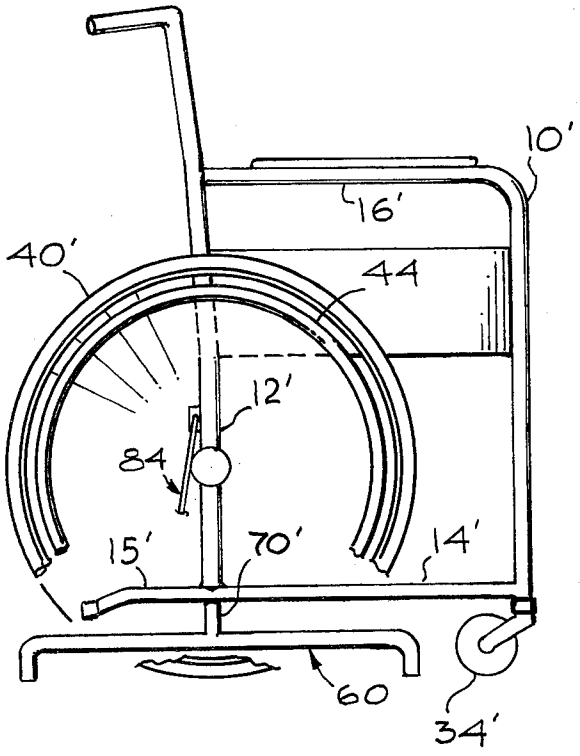


Fig. 6

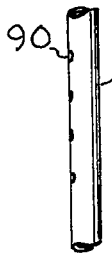


Fig. 8

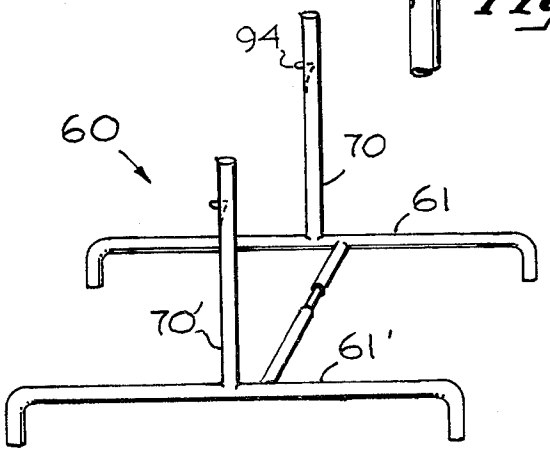


Fig. 7

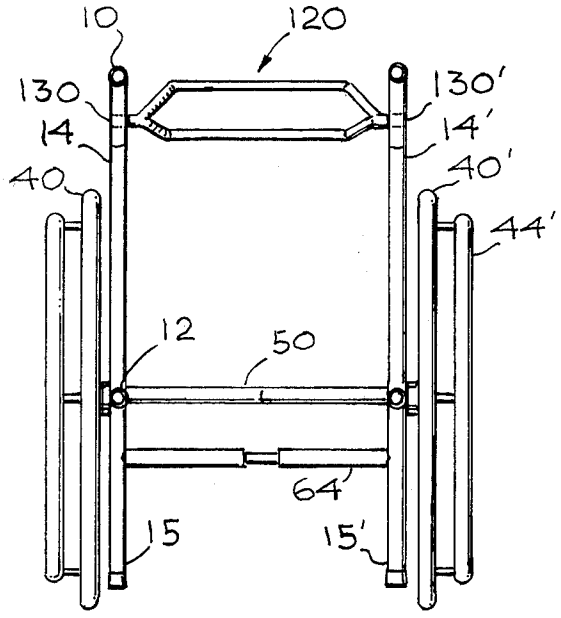


Fig. 9

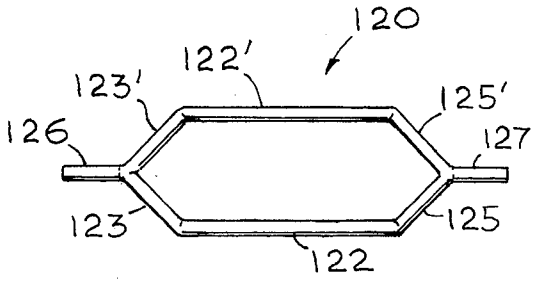


Fig. 10

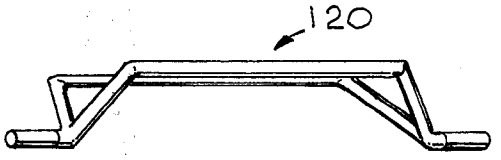


Fig. 11

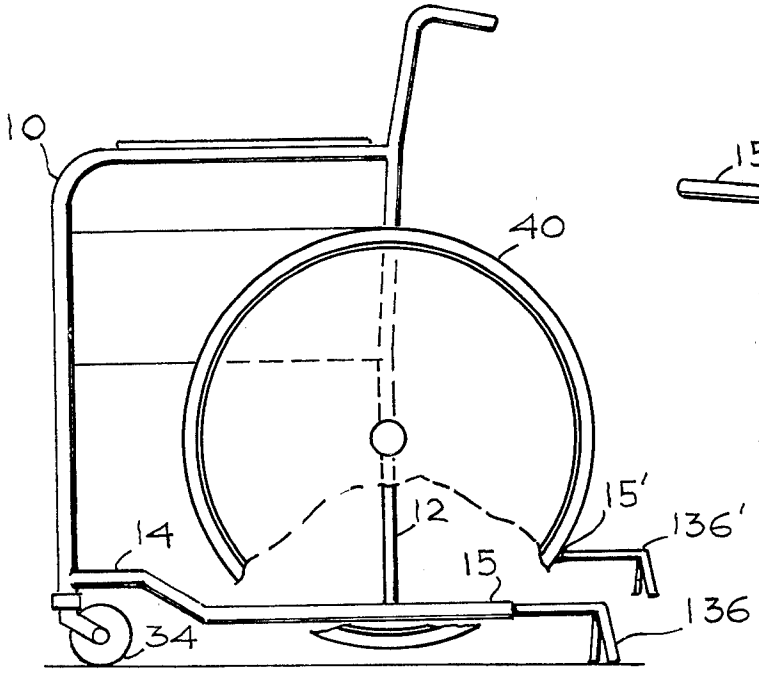


Fig. 12

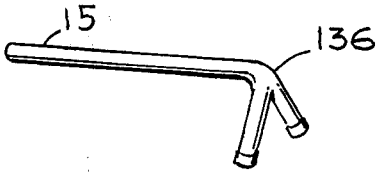


Fig. 13

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 actuatable 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. Numeral 14 designates a transverse lower frame member extending between the vertical frame members 10 and 12. Numeral 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

chair. 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 frame member **16** there being a similar arm rest 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 axle of wheel **40** is designated at **42** and it is welded to the upright 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 desired. 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 actuatable 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 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 abuttments 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** reengage 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. **1–5.**

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 trunions **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 journaled bearings **130** and **130'** in which are journaled the trunions **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 quickly 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 understood 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 wheel chair 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 of 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

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 therefrom 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.

* * * * *