United States Patent [19]

Smith

[11] **3,840,034**

[45] **Oct. 8, 1974**

[54] **FOLDABLE INVALID WALKER**

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[22] Filed: **Feb. 22, 1972**

[21] Appl. No.: **228,284**

Related U.S. Application Data

[63] Continuation of Ser. No. 69,538, Sept. 4, 1970, abandoned.

[52] **U.S. Cl.** ..... **135/45 A**

[51] **Int. Cl.** **A61h 3/00**

[58] **Field of Search** ..... 135/45 A; 182/176; 297/5, 297/6, 42, 56, 57; 5/99 R, 102, 114; 108/111, 113, 160; 272/70.3; 280/36, 41, 87.02

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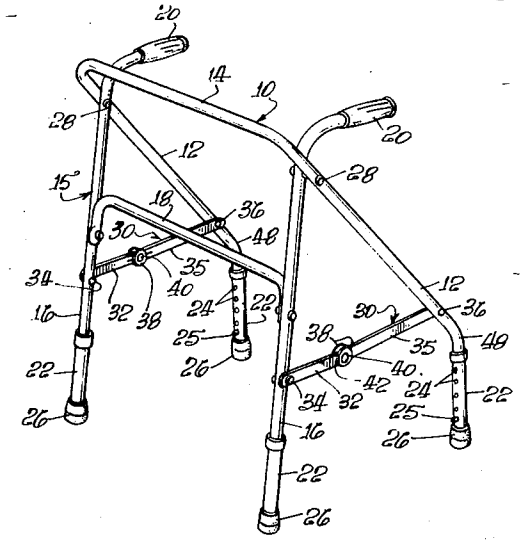
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[57] **ABSTRACT**

One frame forms a rearward pair of legs and a second frame forms a forward pair of legs, one of the two frames being of U-shaped configuration, and one of the two frames forming two rearwardly extending handles. One of the two frames straddles the other and is pivotally connected thereto at spaced points on a transverse axis to make the walker foldable and releasable braces make the unfolded structure rigid.

15 Claims, 11 Drawing Figures



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SHEET 1 OF 3

FIG. 1.

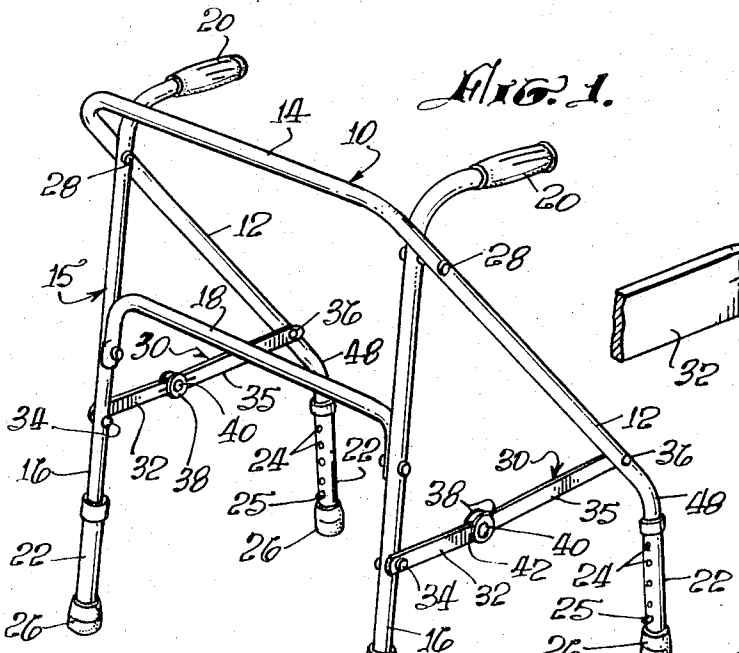


FIG. 4.

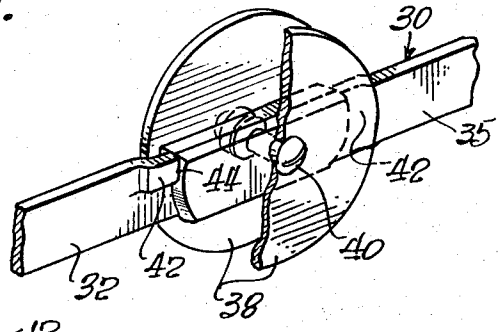


FIG. 2.

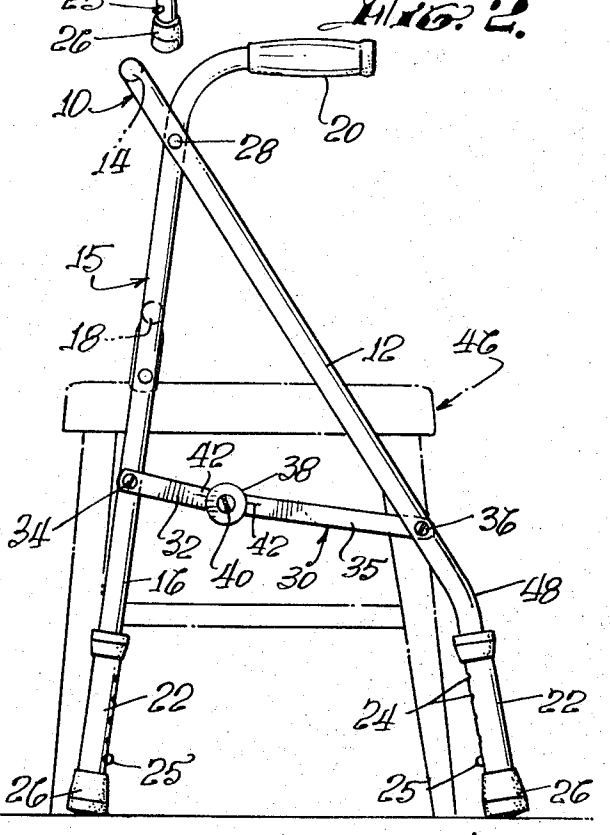
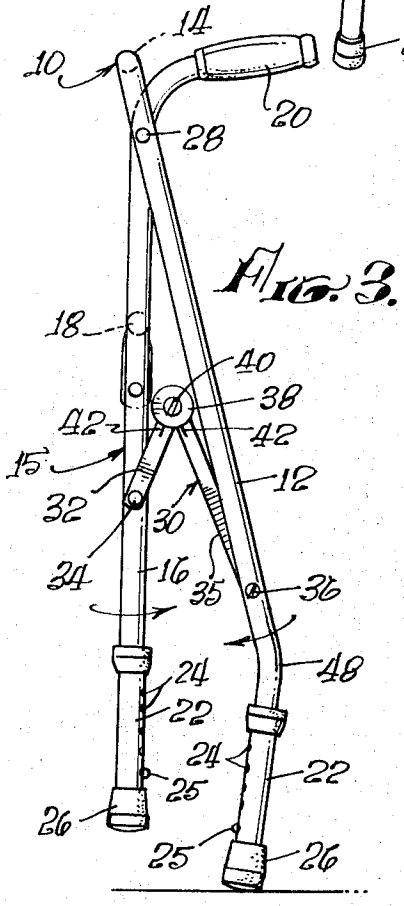


FIG. 3.



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FIG. 5.

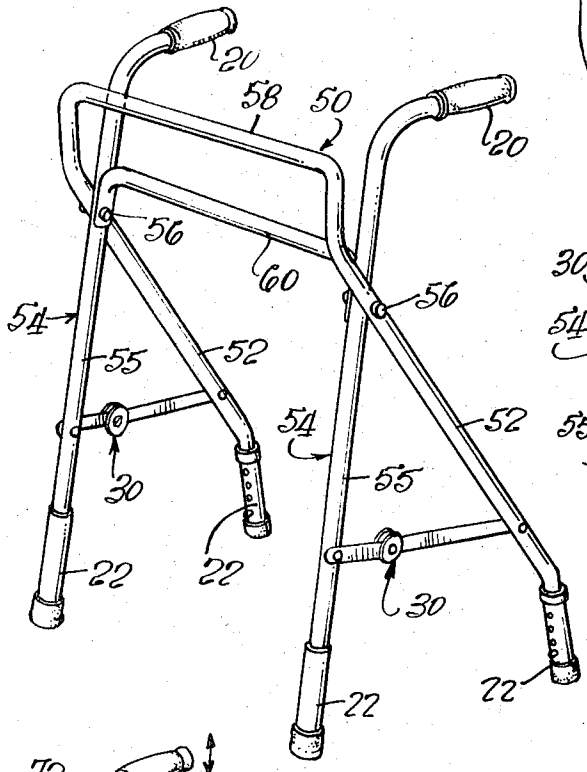


FIG. 6.

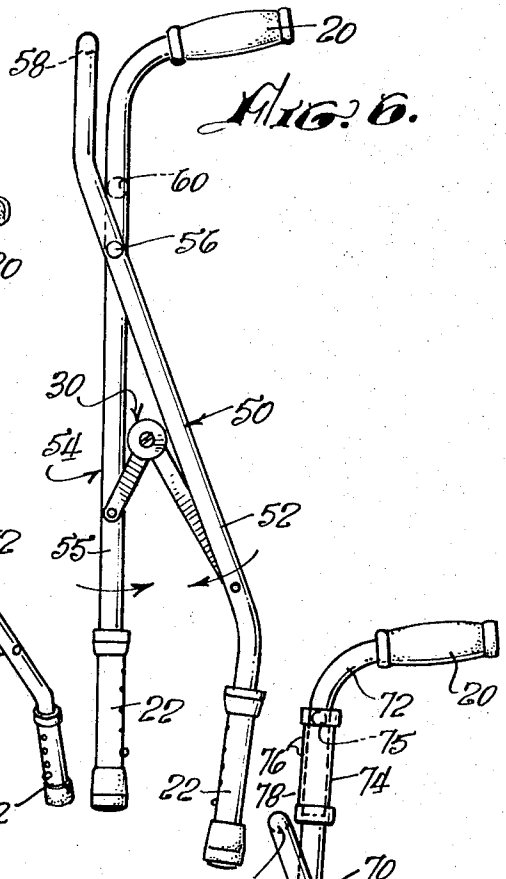


FIG. 7.

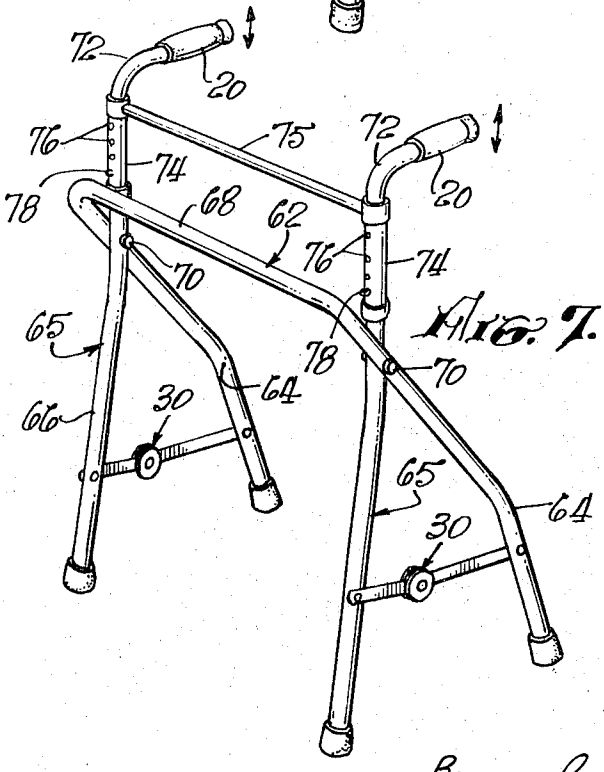
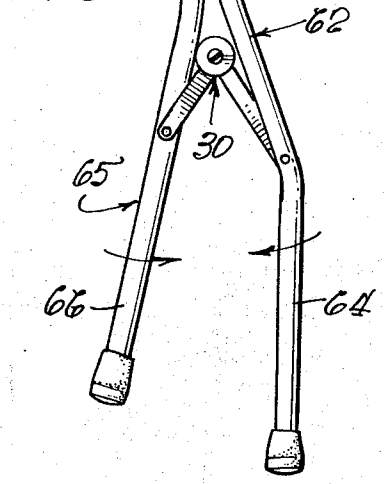


FIG. 8.



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FIG. 9.

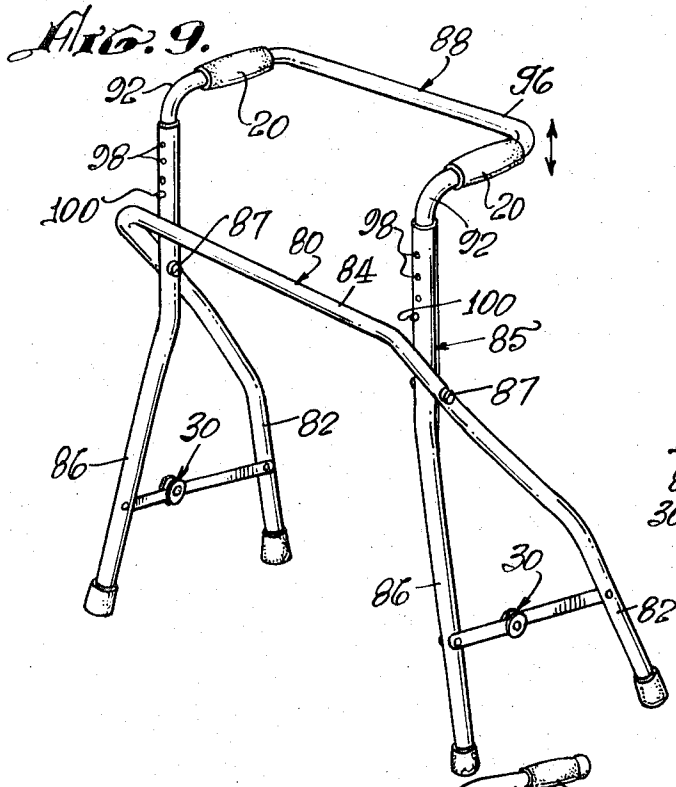


FIG. 10.

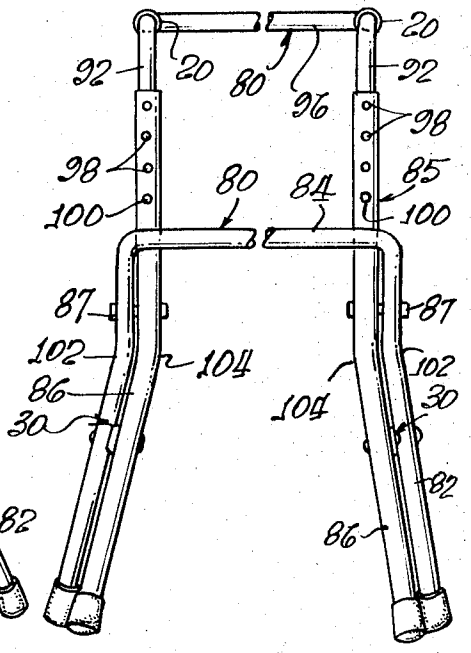
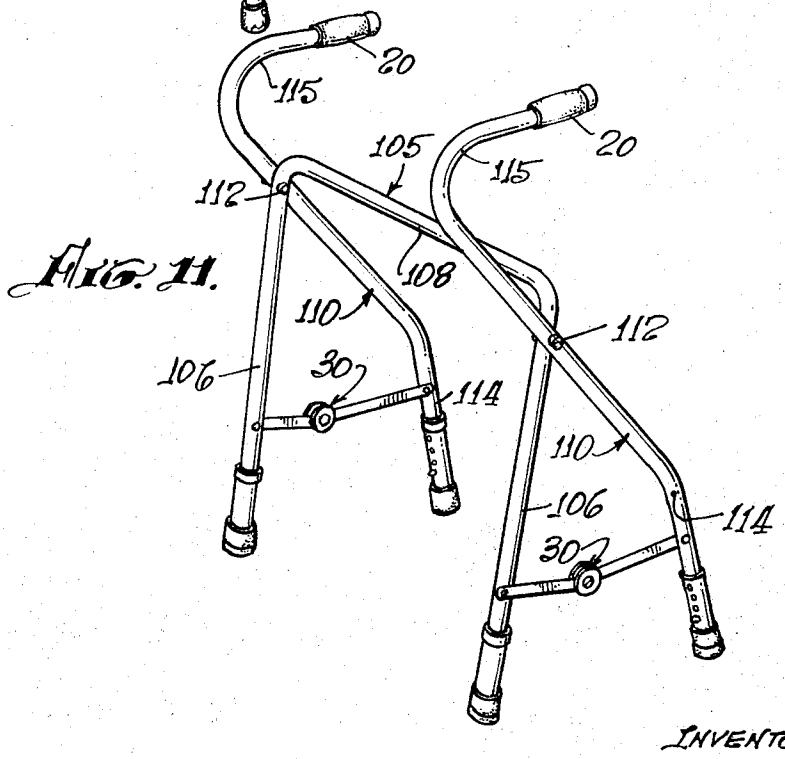


FIG. 11.



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FOLDABLE INVALID WALKER

This application is a continuation of U.S. application Ser. No. 69,538, filed Sept. 4, 1970 now abandoned.

BACKGROUND OF THE INVENTION

Foldable invalid walkers are disclosed, for example, in the Diehl et al. U.S. Pat. No. 2,866,495 and the two Ries patents, U.S. Pat. Nos. 2,734,554 and 2,966,070.

It is highly desirable that an invalid walker not only be rigid to resist forward and rearward thrusts but also have lateral rigidity to resist alternate lateral thrusts, rigidity in both respects being essential to create confidence on the part of the user. The provision of lateral rigidity is made difficult by the requirement that the walker by open from the rear to admit the user and the requirement that any traansverse structure that units the twp space rear legs of the walker not only be out of the way to avoid hindering entrance of the user into the walker but also be out of the way to avoid hindering the forward leg movements of the user.

The above three patents disclose walkers in which the problem of forward and rearward rigidity is met effectively by employing two rigid side frames, each forming a forward leg and a rearward leg with rigid structure interconnecting the two legs. All three of the disclosures, however fail to provide the desired degree of lateral rigidity.

In the Diehl et al disclosure and in the first mentioned Ries disclosure, the two side frames each form a forward leg and a rearward leg wtih the two side frames interconnected at their forward ends by crossed links, and the links are pivotally interconnected at their mid points for collapse of the structure by pivotal action on a central longitudinal axis. Thus there is only one pivot point on the pivot axis which is at the forward end of the structure and is remote from the rear legs which take most of the load that is imposed by the user.

In the second mentioned Ries disclosure, two rigid side frames, each providing a forward leg and a rearward leg, are hinged respectively to opposite sides of a third transverse forward frame so that the folding action occurs on two separate upright hinge axes. Such a construction is deficient in lateral rigidity because the forward interconnecting frame is remote from the two rear legs and also because lateral forces imposed on the walker are transmitted through the two hinge structures which inevitably have some degree of looseness.

The object of the present invention is to provide a foldable walker of simple construction with economy of material and with a high degree of inherent forward and rearward rigidity as well as a high degree of inherent lateral rigidity.

SUMMARY OF THE INVENTION

In the new walker construction the two rear legs are permanently rigidly interconnected by integral transverse structure and the two forward legs are also permanently rigidly interconnected for effective lateral rigidity of the walker. The forward pair of rigidly interconnected legs and the rearward pair of rigidly interconnected legs fold relative to each other and positively lock at their unfolded positions to give the unfolded walker forward and rearward rigidity.

The two frames that provide the forward and rearward pairs of legs, respectively, intersect each other on each side of the walker with one frame straddling the other frame and the two frames are pivotally interconnected at their intersection points on the opposite sides of the waker. Stability forwardly and rearwardly is assured, first, by pivotally interconnecting the two frames at their two widely spaced intersection points on a common transverse pivot axis and, second, by employing two releasable braces to interconnect the two frames on the opposite sides, respectively, of the walker with each brace functioning in a rigidly-promoting manner. Thus when the walker is unfolded for service its two frame structures, each of which inherently provides lateral rigidity are both pivotally connected and interlocked on opposite sides of the walker to form A-frames that provide the required degree of forward and rearward rigidity.

The features and advantages of the invention may be understood from the following detailed description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which are to be regarded as merely illustrative:

FIG. **1** is a perspective view of a first embodiment of the walker;

FIG. **2** is a side elevation of the walker in its unfolded state;

FIG. **3** is a side elevation of the walker in folded state;

FIG. **4** is a fragmentary perspective view, partially broken away, showing the construction of a collapsible brace that is employed in the walker;

FIG. **5** is a perspective view of a second embodiment of the walker;

FIG. **6** is a side elevation of the second embodiment in folded state;

FIG. **7** is a perspective view of a third embodiment of the walker;

FIG. **8** is a side elevation of the third embodiment in folded state;

FIG. **9** is a perspective view of a fourth embodiment of the walker;

FIG. **10** is a front elevation of the fourth embodiment of the walker; and

FIG. **11** is a perspective view of a fifth embodiment of the walker.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

The first embodiment of the invention shown in FIGS. **1 – 4** comprises two means that are pivotally interconnected for folding action about a transverse axis. One of the two means is a frame in the form of a single U-shaped member **10** that provides a pair of rearward legs **12** integrally connected by an elevated transverse bar **14,** and the other of the two means is a frame, generally designated **15,** that provides a pair of forward legs **16.** The frame **15** comprises two upright side members which are rigidly interconnected by a transverse bar **18** and which at their upper ends are bent rearward to form handles equipped with hand grips **20.**

While the walker may be made of any suitable material, the present embodiment is made of aluminum tubing and, in a well known manner, the height of the walker may be adjusted by means of short tubes **22** that are telescopically mounted on the lower ends of each of the four legs. Each short tube **22** has a longitudinal

series of radial bores **24** and a spring-pressed detent member **25** with a rounded nose is retractably mounted in the lower end of each leg to engage the radial bores selectively. Thus to change the effective length of a leg to change the height of the walker it is necessary merely to depress the rounded nose of a detent member **25** and then shift the tube **22** to cause the detent member to snap into a different radial bore. In a well known manner, the lower end of each of the short tubes **34** is provided with an elastomeric tip **26** for non-slipping engagement with the floor or ground.

The first frame **10** straddles the second frame **15** and is pivotally connected thereto by pivot bolts **28** on opposite sides of the walker, the two pivots bolts being on a common transverse pivot axis. On each of the two sides of the walker, the rearward leg **12** and the forward leg **16** are interconnected by a brace, generally designated **30,** that is releasable to permit the folding action. Instead of making the two braces **30** releasable from extended state by making them physically releasable from one of the two associated legs, I prefer to make them releasable from extended state by simply making them collapsible or foldable.

Each of the two foldable braces **30** comprises a forward link **32** connected to the corresponding forward leg **16** by a pivot bolt **34** and a rearward link **35** connected to the corresponding rearward leg **12** by a pivot bolt **35.** As indicated in FIG. **4** the two links **32** and **35** overlap at their inner ends and are straddled at their inner ends by a pair of disks **38.** A pivot bolt **40** interconnects the overlapping inner ends of the two links and at the same time ties the two disks **38** together. Each of the two links **32** and **35** is lanced as indicated at **42** in FIG. **4** and the lanced portion is offset as shown to form a shoulder **44** to abut against the inner end of the other link and thus limit the unfolding action of the brace. The brace unfolds slightly past center for locking action, i.e. to resist forces longitudinally of the unfolded brace that tend to cause the brace to collapse. The two disks **38** with the cooperation of the pivot bolt **40** confine the overlapping inner ends of the two links to insure that the shoulder **44** of each link will abut the inner end of the other link at the limit unfolded position of the brace.

The described walker is open at the rear to permit the user to walk into the walker between the two rearward legs **12** and the forward tranverse bar **18** is sufficiently elevated to permit the walker full freedom for forward leg movements. A feature of the invention is that the forward transverse bar **18** which is the lowest transverse member of the structure, is sufficiently high to clear a seat of conventional height such as a stool **46** which is shown in phantom or to clear a toilet seat. The user may approach the stool or seat by maneuvering the walker forwardly to straddle the stool or seat as shown in FIG. **2** and then the user, while steadied by the walker, may turn around and sit on the stool or seat. It is to be noted that the two handles are spaced far enough apart to provide ample room between them for the user in seated position and the transverse bar **14** is located to avoid interferring with the sitting position of the user.

It is to be noted in FIG. **2** that each of the two rearward legs **12** of the walker is of angular configuration, each leg having a bend **48.** Above the bend **48** the leg is inclined downward at an angle which makes it convenient for the user to grip the leg for the purpose of assisting the user to rise from sitting position to standing position.

It is apparent that the walker is inherently stable with reference to lateral forces because the two rearward legs **12** are rigidly interconnected by the integral upper transverse bar **14** and the two forward legs **16** are not only rigidly interconnected by the second transverse bar **18** but are also braced by pivotal connection to the U-shaped frame **14.** The integral interconnection of the rearward legs **12** is made possible by the fact that the U-shaped frame **10** inclines forward to place the elevated transverse bar **14** forward out of the way of the user.

Referring to stability with respect to forward the rearward forces, an A-frame is inherently highly rigid with respect to forces in its own plane and when the foldable braces **30** are unfolded past center to their locked positions they combine with the forward and rearward legs to form A-frames on the opposite sides of the walker. The bends **48** in the two rearward legs **12** make possible A-frame structures with the rear legs making contact with the floor at positions nearly perpendicular to the floor.

In the described walker, the forward legs and the rearward legs are spaced relatively far apart to provide ample room for the user between the two handles but the distance of the forward legs from the rearward legs is much less than the width of the walker so that the walker may be turned sidewise when it is necessary to advance the walker through a relatively narrow space. In this regard a feature of the invention is that the upper transverse bar **14** is approximately at the same level as the two handles of the walker. Thus when the user turns the walker sidewise to advance the walker before him through a relatively narrow space, the user may grip the nearest handle of the walker with one hand and may grip the upper transverse bar **14** with the other hand for the dual purpose of effectively maneuvering the walker and of obtaining support from the walker.

An important advantage of the walker is that when the walker is folded as shown in FIG. **6** with the two rear legs **52** in contact with the floor and the folded walker tilted to lift the forward legs **55** out of contact wih the floor, forward downward thrust applied to the two handles causes unfolding action of the walker.

The second embodiment of the invention shown in FIGS. **5** and **6** comprises a first frame **50** that forms a pair of rearward legs **52** and a second frame **54** that forms a pair of forward legs **55,** the first frame straddling the second fame and being pivotally connected thereto by pivot bolts **56.** The two frames are also interconnected by the usual foldable braces **30.** Here again the first frame is a singel U-shaped member with the two rear legs **52** rigidly interconnected by an upper transverse bar **58** and in the second frame **54** the two forward legs **55** are interconnected in a rigid manner by a transverse bar **60.** Each of the two forward legs extends upward to form a corresponding rearwardly extending handle provided with a hand grip **20.**

It can be seen that this second embodiment of the invention differs from the first in that the pivot axis is lower and to compensate for this fact the upper portion of the first frame **50** is bent rearward to make the walker compact when the walker is folded as shown in FIG. **6.**

The third embodiment of the invention shown in FIGS. 7 and 8 comprises a first frame 62 forming a pair of rearward legs 64 and a second frame 65 forming a pair of forward legs 66. Here again the first frame 62 is a single U-shaped member wherein the two rearward legs 64 are rigidly interconnected by a transverse bar 68 and the first frame straddles the second frame and is connected thereto both by pivot bolts 70 and by the usual foldable braces 30. It may be seen that the first frame 62 is relatively short in height.

The second frame 65 includes a pair of angular members 72 each of which has a rearwardly extending arm to serve as a handle and has a downwardly extending forward arm which incorporates an oversized tube 74. The two oversized tubes 74 of the angular members 72 are interconnected by a transverse bar 75 which lends rigidity to the forward legs 66.

For the purpose of making the walker adjustable in height the two oversized tubes 74 of the angular members 72 telescope over the upper ends of the two forward legs 66. Each of the tubes 74 is provided with a series of vertically spaced radial bores 76 and the upper end of each leg 66 has a spring-pressed detent member 78 with a rounded nose to releasably engage the radial bores selectively.

The fourth embodiment of the invention shown in FIGS. 9 and 10 comprises a first U-shaped frame 80 forming a rearward pair of legs 82 rigidly interconnected by an upper transverse bar 84. The second frame 85 of the walker comprises a pair of tubular forward legs 86 and an upper angular tubular member 88 having downwardly extending arms 90 that telescope into the upper ends of the forward legs. The angular member 88 is formed with rearwardly extending arms 92 that are equipped with the usual hand grips 20 and are integrally interconnected by a transverse bar 96, the transverse bar serving to lend rigidity to the forward legs 86. The two frames 80 and 85 are interconnected by pivot bolts 87 and by the usual foldable braces 30. For the purpose of adjusting the vertical height of the two handles of the walker, the upper ends of the two legs 86 are provided with vertically spaced radial bores 98 and the two arms 90 of the angular member 88 are provided at their lower ends with a spring-pressed detent member 100 that releasably engage the radial bores selectively.

A feature of this fourth embodiment of the invention is that the four legs of the walker spread laterally outwardly below the pivot axis to increase the lateral stability of the walker. As may be seen in FIGS. 10, the two rearward legs 82 are formed with bends 102 to spread laterally at floor level and in like manner the two rearward legs 86 are formed with bends 104 for the same purpose.

The last embodiment of the invention shown in FIG. 5 includes a U-shpaed frame member 105 that provides a forward pair of legs 106 rigidly interconnected by an upper transverse bar 108, and includes a pair of separate angular members 110 connected to the opposite sides of the frame member 105 by pivot bolts 112 to form a pair of rearward legs 114. The upper end of each angular member 110 curves rearward to form a handle 115 provided with the usual hand grip 20. On each side of the walker the forward leg 106 is connected to the rearward leg 114 by the usual foldable brace 30.

My description in specific detail of the various embodiments of the invention will suggest various changes, substitutions and other departures from my disclosure within the spirit and scope of the appended claims.

I claim:

1. In an invalid walker, the combination of:
first means providing a pair of spaced forward legs;
second means providing a pair of spaced rearward legs;
said two means being pivotally interconnected on a transverse axis for relative rotation of the two pairs of legs for folding of the walker from extended operating state to inoperative contracted state;
one of said two means comprising a frame of generally U-shaped configuration forming one of the two pairs of legs with the legs of the pair interconnected by a transverse bar at an elevation above said axis;
one of said two means forming an elevated pair of rearwardly extending handles to be gripped by the user, said handles being positioned forward of the points of contact of the rearward legs with the ground when said walker is in its extended operating state;
said walker being open from the rear to permit the user to enter the walker from the rear and to walk between the rearward legs while grasping the handles in the use of the walker;
brace means connecting each of the forward legs to the corresponding rearward leg;
said brace means being normally locked in extended position to keep the walker in extended operating state, said brace means being retractable to permit folding of the walker to inoperative state.

2. A combination as set forth in claim 1 in which the brace is collapsible.

3. A combination as set forth in claim 1 in which the brace is foldable.

4. A combination as set forth in claim 1 in which said U-shaped frame forms the rearward pair of legs, and the U-shaped frame is inclined forward to position said elevated transverse bar forward to avoid interfering with forward leg movements by the user.

5. A combination as set for th in claim 4 in which the means forming the handle is telescopically and adjustably extendable to vary the height of the handles.

6. A combination as set forth in claim 1 in which the legs of one of said two means straddles the other of the two means.

7. A combination as set forth in claim 6 in which said one of the two means is a one-piece U-shaped member.

8. A combination as set forth in claim 1 in which the rearwardly extending handles is on the one of the two means that provides the forward pair of legs,
whereby the user may unfold the folded walker by grasping the handles and exerting a downwardly and forwardly directed force on the rear pair of legs.

9. A combination as set forth in claim 1 in which each of said foldable braces is unfoldable to a past-center position to make the brace non-responsive to contracting force across its extended length.

10. A combination as set forth in claim 1 in which said first means that forms the forward pair of legs

forms the pair of rearwardly extending handles for use by the operator in moving the walker forward;

in which the overall fore-and-aft dimension of the walker is substantially less than the width dimensions;

in which said second means that forms the rearward legs comprises said frame and said transverse bar of the frame is at least approximately of the elevation of the handles, and

said second means is longer than said first means such that the rear legs are longer than the front legs and extend beyond the front legs when said walker is in its contracted state.

11. A combination as set forth in claim **1** in which one of said two means straddles the other of the two means;

in which the two means intersect each other at points on opposite sides of the walker;

in which the two means are pivotally interconnected at the two intersection points, and

in which the two brace means are foldable and interconnect the forward and rearward legs on the opposite side respectively of the walker in regions below the points of intersection of the two means.

12. In an invalid walker, the combination of:

first means providing a pair of spaced forward legs;

second means providing a pair of spaced rearward legs;

said two means being pivotally interconnected on a transverse axis for relative rotation of the two pairs of legs for folding of the walker from extended operating state to contracted state;

one of said two means comprising a frame of generally U-shaped configuration forming one of the two pairs of legs with the legs of the pair interconnected by a transverse bar at an elevation above said axis;

one of said two means forming an elevated pair of rearwardly extending handles to be gripped by the user, said handles being positioned forward of the points of contact of the rearward legs wtih the ground when said walker is in its extended operating state;

said walker being open from the rear to permit the user to enter the walker from the rear and to walk between the rearward legs while grasping the handles in the use of the walker;

each of the forward legs being connected to the corresponding rearward leg by a corresponding brace means which is normally locked in its extended operating position;

said brace means being releasable to permit folding of the walker, and

the walker being open from below with sufficient clearance to clear a toilet seat whereby the user may advance the walker into a position with the walker straddling the seat and then the user may turn around to sit on the seat.

13. A combination as set forth in claim **12** in which an upper portion of each of the two rear legs of the walker is inclined rearwardly and downwardly of the walker to serve as means to be gripped by the user to assist the user to rise to a standing position from said toilet seat.

14. In a invalid walker, the combination of:

first means providing a pair of spaced forward legs;

second means providing a pair of spaced rearward legs;

said two means being pivotally interconnected on a transverse axis for relative rotation of the two pairs of legs for folding of the walker from extended operating state to contracted state;

one of said two means comprising a frame of generally U-shaped configuration forming one of the two pairs of legs with the legs of the pair interconnected by a transverse bar at an elevation above said axis;

one of said two means forming an elevated pair of rearwardly extending handles to be gripped by the user, said handles being positioned forward of the points of contact of the rearward legs with the ground when said walker is in its extended operating state;

said walker being open from the rear to permit the user to enter the walker from the rear and to walk between the rearward legs while grasping the handles in the use of the walker;

each of the forward legs being connected to the corresponding rearward leg by a corresponding brace means which is normally locked in its extended operating position;

said brace means being releasable to permit folding of the walker;

the said means which forms an elevated pair of handles being the means which provides the forward pair of legs;

the second means being longer than the first menas such that the rear legs are longer than the front legs and extend beyond the front legs when said walker is in its contracted state, and

the walker being open from below with sufficient clearance to clear a toilet seat whereby the user may advance the walker into a position with the walker straddling the seat and then the user may turn around to sit on the seat.

15. A combination as set forth in claim **14** in which an upper portion of each of the two rear legs of the walker is inclined rearwardly and downwardly of the walker to serve as means to be gripped by the user to assist the user to rise to a standing position from said toilet seat.

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