



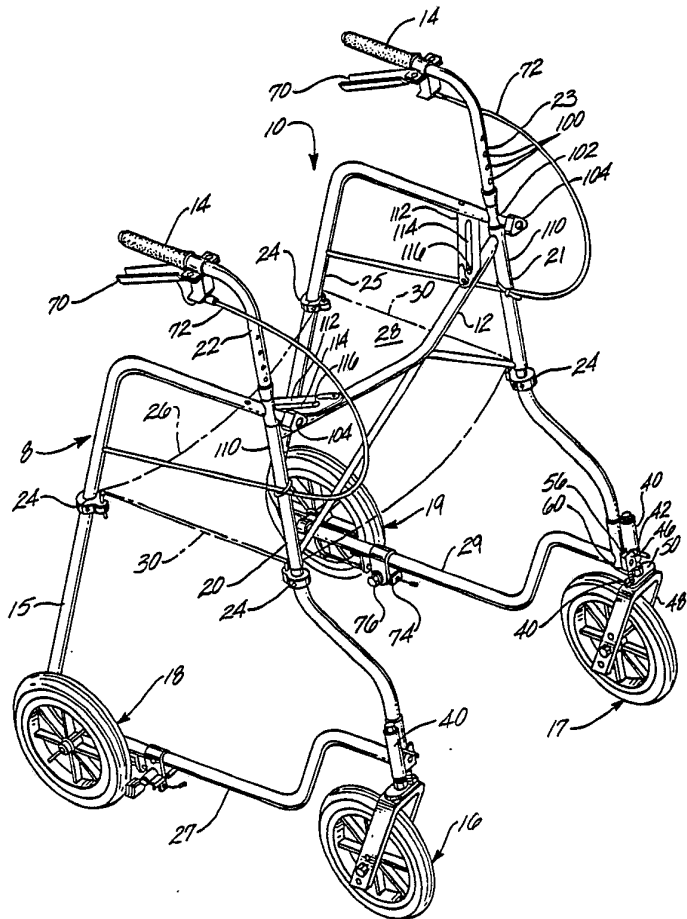
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(54) Title: FOLDABLE ROLLING WALKER

(57) Abstract

A foldable rolling walker having a high cross-bar (12) for easier walking convenience, height adjustable handles (22) centered over offset wheels (16, 17, 18, 19) for greater stability, lockable pivoting front wheels (16, 17) and reversible brakes (74, 76). The overall design is compact, lightweight and very stable. The walker includes a seat (26) removably mounted between the side frames of the walker by collar clamps (24) secured to the frame of the walker.



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FOLDABLE ROLLING WALKER

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FIELD OF THE INVENTION

This invention pertains to the field of walking aids and, more particularly, to a rolling walker with a particularly stable and convenient design that can be folded into a compact flat configuration.

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BACKGROUND OF THE INVENTION

The increasing number of elderly and handicapped who require assistance in walking has created new demands in the field of walkers. Most walkers have handles for the user to grasp which are incorporated into or mounted on a support frame. The design of the support frame must be lightweight, sturdy and stable and at the same time permit the free movement of the user's feet and legs. To further enhance its convenience, utility, and portability, it is also important that the walker be foldable into a compact flat configuration which can be conveniently tucked away in cars, restaurants and other public places. It has proven difficult in the past to satisfy all of these competing requirements, especially with rolling walkers which have the added complexity of wheels and brakes.

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The present invention provides a frame design which overcomes many of the shortcomings of prior rolling walkers, which were either strong but bulky or compact

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1 but unstable. The present invention is lightweight and
stable and folds into a virtually flat configuration.
An expanded wheel base provides an extremely stable
support for the user. The user's weight is centered and
5 balanced evenly over all four wheels enhancing stability
still further. Many important features have been added
to this basic framework design making the walker still
more advantageous as described below.

10 SUMMARY OF THE INVENTION

The present invention provides a rolling walker
having an elevated horizontal cross brace and a side
frame pivotally mounted at each end of the cross brace.
The cross brace is mounted high and forward on the side
15 frames. Each side frame has a front and a rear leg.
The cross brace is located toward the front of the
walker and includes a vertical sleeve at each side
thereof, which receives the front leg of each side frame
in a pivotable relationship. A wheel is attached to
20 each leg of the side frames to support the walker on the
ground. A handle assembly is mounted at the top of each
side frame so as to position the handle substantially
midway between the front and rear wheels for supporting
the weight of the user. The front wheel is offset
25 forward of the cross brace and the pivot axis of the
side frames so that the user's weight is centered over
the wheels.

The side frames pivot toward each other so that the
walker can be folded substantially flat for storage or
30 transit. The front wheels are pivotally mounted but can
be locked into alignment with the rear wheels. The
handles are vertically adjustable to accommodate the
height of the user. The rear wheels include a brake
mechanism which enables the brake pads to be alternately
35 positioned so that the wheels are normally prevented

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1 from rolling unless the hand brakes are operated or the
wheels allowed to roll unless the hand brakes are
applied. A seat is optionally mounted between the side
frames using seat pins at each corner that are received
5 into the seat pin receptacles mounted on the front and
rear legs of the side frames. The seat formed thereby
extends between the side frames and the cross brace
provides a backrest.

A number of aspects of the rolling walker according
10 to the present invention provide important advantages
and benefits. The front wheels of the present invention
incorporate a caster pin-locking system. The heart of
this system is a flip lever which moves between one
position in which the front wheels are locked straight
15 ahead, and a second position in which the wheels are
unlocked and can free-wheel.

Still another advantage is that the push handles
are freely adjustable without having to change any other
component of the walker, including the components of the
20 braking system. The push handles are formed from shaped
tubes in which the lower portion of the tube telescopes
into the frame. Knobs at the front of the walker
unscrew, and removing the knobs allows the tubes to be
raised and lowered to adjust the height. A physical
25 therapist can thus specifically prescribe the height of
each of the push handles. The range of heights
obtainable by adjustment of the handles also means that
the walker can be used by most users regardless of their
actual height.

30 As has been indicated above, the brakes can be
arranged so that the braking system operates on a
squeeze-and-stop principle or a squeeze-and-go
principle. In the latter, the brake acts like a dead-
man switch, so that if the user is weak and can't grasp
35 the brake, the wheels immediately lock, and the user has

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1 a stable platform. The orientation of the brake pads at
the wheels are reversed to obtain the two different
braking approaches. To go from a squeeze-and-stop mode
to a squeeze-and-go mode, the brake pads are removed,
5 inverted and refastened on the walker.

Another advantageous aspect of the braking system
according to the present invention is that the brake
cable enters into the frames and passes interiorly
through the tubing rather than exteriorly, adding to the
10 clean lines and aesthetic appearance of the walker.
Providing sufficient slack in the brake cables enables
the handles to be adjusted up and down without the need
to detach and reattach the brake cables.

The hand brake levers are cup-shaped and have a
15 radius of curvature such that when the brake levers are
operated, the handle portion of the push handle nests
with the cup-shaped brake lever.

A walker according to the present invention, the
walker has a completely open interior and puts the user
20 directly in the center of the walker. This is in
contrast to prior-art rolling walkers where the user is
positioned to the rear of the center of the unit.

The preferred embodiment of the seat is a fabric
sling supported by pins of each corner which crop into
25 receptacles in housings clamped to the framework of the
walker. The seat can also be of a more rigid material
that folds, pivots or is removed entirely so that the
walker can be folded.

Other structural features of importance are the
30 provision of separate caster sockets for mounting the
wheels. Such caster sockets are clamped externally to
the frame of the walker, rather than incorporating wheel
supports into the frame itself.

Prior-art rolling walkers are characterized by the
35 problem that they are heavy and hard to fold. In most

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1 prior-art walkers so equipped, the brake lever throw is
also quite long. Finally, in walkers that are provided
with seats, most have no backrest.

5 The walker incorporating the above features is
safer, easier and more convenient to use than prior-art
designs. The frame structure is stronger and more
stable than prior designs. It is also lightweight,
compact and easy to move. These and other features
10 allow the walker to be adapted to the particular needs
of the user more quickly and more completely than prior
designs.

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1 BRIEF DESCRIPTION OF THE DRAWINGS

 FIG. 1 is a perspective view of a rolling walker according to the present invention;

5 FIG. 2 is a plan view of the walker in the folded configuration;

 FIG. 3A is a front elevation detail view of the front wheel and wheel locking system when the wheel is unlocked;

10 FIG. 3B is a front elevation detail view of the front wheel and wheel locking system when the wheel is locked;

 FIG. 4 is a side elevation detail view of a rear wheel and brake pad mechanism;

15 FIG. 5A is a perspective view of the rear wheel braking system with the brake pad configured in the normally ON position;

 FIG. 5B is a perspective view of the rear wheel braking system with the brake pad configured in the normally OFF position;

20 FIG. 6 is an exploded view of a rear wheel brake pad illustrating the manner in which the rear brake is reconfigured from normally OFF to normally ON;

 FIG. 7 is a detail side elevation view showing the adjustable push handle, brake lever and brake cable; and

25 FIG. 8 is a detail side elevation view of the seat, seat collars and one side frame of the present invention.

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1 DETAILED DESCRIPTION OF THE INVENTION

 The preferred embodiment of the rolling walker according to the present invention is shown in perspective in FIG. 1. The walker includes two side frames 8 and 10 connected by a crossbar assembly 12. The side frames 8, 10 support push handles 14 and have front wheels 16, 17 and rear wheels 18 and 19, respectively, attached to the side frames of the base thereof. The frames are preferably made of an anodized aluminum tubing, but any lightweight, rigid material; for example, plastics or other metal alloys, could be used. In an alternate embodiment of the invention, particularly when the walker is intended to be used in rugged environments, the frames are constructed of heavy-duty steel or other stronger and more rugged materials.

 The side frames are of a special unique design which allows for both greater stability and compact folding. The front legs 20, 21 of frames 8, 10 have a straight portion which receives the push handle tubes 22, 23 in a telescoping relation in and out of the side frames, as shown in FIG. 8. At the base, legs 20, 21 are offset away from the front of the walker and are angled sharply forward so that front wheels 16, 17 are located well forward of push handles 14 to provide a wide wheel base. In conventional walkers, the front wheels are located almost directly below the handles. This makes the walker easier to tip if the user inadvertently leans too far forward.

 Rear wheels 18, 19 are mounted at the rear of the walker and attached to the side frames 8, 10 adjacent the junction of rear legs 15, 25 and lower horizontal braces 27, 29. The specific location of the rear wheels is chosen so that the push handles are centered between the front and rear wheels. While many walkers locate

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1 the push handles directly above the front wheels, other
walker designs locate the push handles too far toward
the rear of the walker. Both locations make the walker
less stable.

5 The distance between the front and rear wheels is
effectively determined by the width of the crossbar
assembly 12. When the side frames are folded, as shown
in FIG. 2B, the rear wheels are pivoted toward each
other until they are essentially in line. The crossbar
10 assembly bows outward slightly forming a space between
the side frame 10 and the crossbar when the side frame
10 is folded. Side frame 8 and its rear wheel 18 fit
into this area when folded which enables the walker to
fold flat with the result that all four wheels are
15 substantially aligned from front to rear of the walker.
If the crossbar assembly were narrower, this space would
be smaller, and side frame 8 would also have to be
smaller in order to fold flat. The dimensions of the
various components of the walker are scaled up or down
20 on a relative basis, depending on the physical size and
stature of the intended user. Thus, it is contemplated
that there will at least be two primary size walkers,
adult and child, for the present invention. Additional
sizes for short or tall adults are also contemplated.

25 The upper vertical portions of legs 20, 21 define
the pivot axes for the folding action of the side
frames. In order to keep the push handles centered
between the wheels, the distance between front and rear
wheels is maintained at somewhat less than double the
30 length of the crossbar. Such a configuration places the
pivot axes of the side frames in the forward portion of
the wheel base.

Clamped to the side frames are four seat pin collar
supports 24. When the user becomes tired and wishes to
35 rest, these seat pin collar or supports allow him to set

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1 up a seat 26 and rest. The seat is comprised of a
flexible sheet material 28 such as canvas or any other
similar material with support rods 30 sewn along each
side. The support rods 30 have pins 51, 53 formed on
5 each end, which fit into receptacles in the clamped
collar pin supports 24. The result is a sturdy,
lightweight sling seat extending between the side
frames. While the preferred embodiment uses a flexible
sheet material, other folding seat designs including a
10 rigid bench support well known in the art could be used
as well.

The seat in the present invention is a substantial
improvement over prior art designs, in that the cross-
brace being elevated and bowed forward, provides a
15 convenient backrest. Many folding seat designs for
invalids have no backrest whatsoever. The cross-brace
can be padded for still greater comfort without
substantially reducing the overall utility of the
invention.

20 Referring to FIGS. 3A and 3B, front wheels 16, 17
are mounted to the side frames on casters 40 so that
they swivel freely. This is a great convenience to
users with reasonably good muscle control, as it is
easier to steer the walker in the desired direction.
25 However, if the user has poor muscle control or has
become fatigued, the swiveling front wheels are a source
of instability and make the walker difficult to control.
In contrast to prior art designs, in the present
invention, the wheels may be allowed to swivel freely or
30 be locked in position with a simple flip of a locking
lever 42.

In the forward position, lever 42 becomes a lock
shaft which locks the front wheels 16, 17 in place. An
extension of lever 42 runs through a housing 46 which is
35 connected to the side frame. Front wheel 16 is

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1 rotatably mounted by forks 48 that end in a top plate
50. Top plate 50 has a hole 52 offset from the pivot
point 54 of the front wheel. When wheel 16 is rotated
to the forward position, hole 52 lies directly beneath
5 the extension end of the lever 42. In the forward
position, the extension reaches into hole 52 and wheels
16, 17 are locked in the forward direction. The
extension is controlled by turning the lever 42. When
the lever is turned forward as shown in FIG. 3A, it
10 rests in the cleft 53 cut into the top surface 56 of
housing 46. When lever 42 is rotated 90°, it rests in a
curved slot 57 in the housing 46 as shown in FIG 3B
unlocking the wheels. A spring 60 against the bottom of
the housing 46 and a ring around the extension biasing
15 and holding the extension in the lowest position allowed
by the lever and preventing the wheels from accidentally
unlocking.

The rear wheels are equipped with a reversible
cable actuated brake. The brakes are operated by unique
20 cup shaped brake levers 70 which are easier to grip than
conventional brake levers. Squeezing the brake levers
70 toward the handles 14 pulls the brake cables 72. The
brake cables are enclosed within the hollow tubing of
the walker throughout most of its length between the
25 handles and the brake pods. The result is improved
safety because the cable is less likely to catch on or
snag on obstructions and an improved, less cluttered
appearance of the walker. Sufficient slack is provided
in the brake cables to enable adjustment of the push
30 handles without requiring adjustment of the brake cables
at the handles or the brake pads.

In the preferred embodiment, the brake pads are
mounted forward of the rear wheels so that the wheels
can be mounted adjacent the rear of the side frames 8
35 and 10, as shown in FIGS. 5A and 5B. Pulling the cable

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1 therefore pulls a lever arm 74 rearward towards the rear
wheel. This lever arm pivots on a central shaft 76 that
is directly connected to the brake pad arm 78. The
brake pad arm moves the brake pad 80 either against or
5 away from the rear wheel tire. A coil spring 82 holds
the brake pad in place when the cable is not being
pulled. The amount of travel on the brake pull 70
required to activate the brakes is determined by the
length of the levers 74 and 78. Preferably, the braking
10 system is arranged with a very short amount of travel
for the brake levers.

FIGS. 5A and 5B illustrate that the brake pad arm
can be mounted in either of two positions on the central
pivot. In FIG. 5A, brake pad arm is oriented so as to
15 extend upwardly from shaft 76 when so positioned, a pull
on the brake cable moves the brake pad away from the
wheel. Coil spring 82 holds the brake against the wheel
until the lever is pulled; the brake in this position is
therefore normally on.

20 In operation, this arrangement of the brake is
desirable if, for example, a user experiences sudden
weakness. When the user becomes weak, his grip on the
brake levers 70 loosens, actuating the brake, stopping
the walker and providing a solid non-moving support.
25 This arrangement of the brake is also desirable for a
user who frequently uses the walker for support in
standing up from a sitting position when the brake
levers are hard to reach. It is also desirable for a
user who stops and rests frequently.

30 As shown in FIG. 5B, the brake pad arm 78 is
inverted and oriented so that it extends downwardly from
shaft 76. In this position, spring 82 holds the brake
pad away from the wheel. In this arrangement, a pull on
the cable 72 pushes the brake pad 50 against the rear
35 wheel tire, stopping the wheel. This is a desirable

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1 arrangement of the braking system for stronger, more
mobile users who do not want to squeeze the brake lever
constantly while walking but desire the capability of
braking the wheels when the walker is to be stopped.

5 The brakes can be quickly placed in either
configuration depending on the needs of the user. In a
third alternative, one brake can be configured as in
FIG. 5A, and the other as in FIG. 5B on the same walker,
thereby combining the advantages of both arrangements.
10 The invention can thus be easily adapted to varying
needs.

As shown in FIGS. 1 and 7, the push handles are
adjustable up and down. The handle support tubes 22
slide in and out of the straight portion of the side
15 frames 20. The support tubes are drilled with a series
of holes 100 and the side frame is drilled with a single
hole 102 to adjust the handles 14 up and down. To
adjust the height of the handles, pin 104 is unscrewed
from the side frame. The push handle support tube is
20 then moved into the desired position with one of the
holes 100 on the support tube aligned with the hole 102
in the side frame. Pin 104 is then reinserted by
screwing it into hole 102 where it passes through
apertures 100 on both sides of the support tube 22 and
25 securely holds the tube in place.

Each push handle is thereby independently
adjustable to a number of discrete positions depending
on the needs of the user. In an alternate embodiment
frictional engagements of the push handle tubes are
30 contemplated permitting positioning of the height of the
push handles at an infinite number of selectable
positions. Again depending on the particular
application, the push handle tubes can be mechanically
linked to cause both handles to be positioned
35 simultaneously rather than independently.

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1 FIG. 2 illustrates the folding action of the
preferred embodiment of the present invention. The side
frames 8 and 10 are mounted to crossbar 12 at pivot axes
110. The pivots allow the rears of the side frames to
5 be moved inward and folded against each other, as shown
in FIG. 7B.

 When the walker is unfolded as shown in FIG. 1, the
side frames are held in place with diagonal brace 112
which can be locked in the unfolded position. Brace 112
10 includes a slot 114 in which a pin 116 fixed to the
cross-brace 12 slides. When the side frames are pushed
towards each other, the diagonal brace pivots on the
side frames and the pin slides in the slot allowing the
side frames to move. The locking mechanism and other
15 details of the diagonal brace are more clearly described
in U.S. Letters Patent 3,945,389 which is hereby
incorporated by reference. As shown in FIG. 2 when the
walker is folded, the front and rear wheels are aligned.
The walker, therefore, need not be carried but can be
20 rolled on its own wheels to its storage location.

 An important aspect of the walker of the present
invention is the inclusion of a removable seat which
enables the conversion of the walker to a mini-
wheelchair. In the presently preferred embodiment a
25 length of flexible sturdy material 26 is removably
mountable between the side frames.

 The length of material is provided with the formed
rods 30 attached along each side of the length of
material. The rod is bent at each end at right angles
30 to define mounting pins 51, 53 at each corner of the
seat.

 As indicated, seat collar supports 24 are clamped
to the side frames at a height intermediate the top and
bottom of the side frames. Collars 24 are split rings
35 adopted to encircle the side frame tubes and to be

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1 clamped onto the side frames by means of clamping screws
extending in a tangential direction through the collar
and bridging a split in the ring.

Collars 24 are formed with extensions 31 so that in
5 plan view the collars have a generally pear shaped
configuration. Each extension 31 has a receptacle 32
drilled in it to receive the mounting pins 51, 53 on the
seat supporting rod 30. The seat is positioned by
10 inserting the pins 51, 53 into openings 32 with the
result that the seat is stretched between the side
frames to provide a sling seat for the user of the
walker as is better seen in the phantom indications in
FIG. 1.

The seat arrangement of the present invention
15 improves on that available in prior art walkers by
providing separate seat collars which are clamped onto
the main frame of the walker itself without in any way
invading or weakening the mechanical integrity of the
framework of the walker. Thus the seat of the present
20 invention is supported by the strongest mechanical
elements of the walker.

In contrast, in the prior art attempts have been to
suspend a removable seat from the spreader tubes or
cross arms of a walker. In such approaches, large hooks
25 are secured to the corners of a sling seat. Such hooks
are then hung over the cross arms to suspend the seat
across the center of the walker. The disadvantage is
that such arrangements concentrate the user's weight in
very small areas resulting in tearing of the seat fabric
30 or bending or deforming of the side arms of the walker.

While this disclosure has described only one
embodiment of the present invention, it will be obvious
to one skilled in the art that many other embodiments
are possible without departing from the spirit and scope
35 of the present invention.

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1 WHAT IS CLAIMED IS:

1. A rolling walker comprising:
 - a) a horizontal cross-brace;
 - 5 b) a side frame mounted at each end of the horizontal cross-brace, each side frame having a front leg and a rear leg;
 - c) a wheel mounted adjacent the bottom of each rear leg supporting the rear end of each of the side frames;
 - 10 d) a wheel mounted at the bottom of each front leg of each of the side frames forward of the cross-brace, supporting the front end of the side frames, said wheel being offset forward of the center line of the pivot axis of each side frame;
 - 15 e) at least one push handle mounted at the top of each side frame and positioned substantially midway between the front and rear wheels for supporting a person so that the person's weight is centered substantially equally between the front and rear wheels.
2. The rolling walker of claim 1 in which the cross-brace connects to the side frames forward of the handles at the top of the side frames.
- 25 3. The rolling walker of claim 1 in which the side frames are pivotally mounted to the cross-brace so that the side frames may be folded towards each other.
4. The rolling walker of claim 3 in which the side frames include locks which secure the side frames in the unfolded position.
- 30 5. The rolling walker of claim 1 in which the front wheels are pivotally mounted so that the walker may be pushed in different directions.
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6. The rolling walker of claim 5 in which the pivoting wheel mounts include locks which secure the wheels in a stationary non-swiveling position.

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7. The rolling walker of claim 1 in which the push handle is adjustable vertically to accommodate the height of different users.

10

8. The rolling walker of claim 1 also comprising at least one brake mounted on the side frame which prevents at least one wheel from turning.

15

9. The rolling walker of claim 8 also comprising a pair of brakes overlock mounted on each side frame and means for reversing the orientation of the brakes to alternately convert the braking system from a normally ON mode to a normally OFF mode.

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10. The rolling walker of claim 1 including a seat supported by the side frames.

25

11. The rolling walker of claim 10 wherein the seat comprises a foldable substantially rectangular sheet having a pin at each corner, said pins removably engaging collar supports clamped to the side frames so that the seat may be extended between the side frames in use and folded to one side for storage.

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- 1 12. A rolling walker comprising:
- a) a cross-brace;
- b) two side frames mounted to opposite ends
of the cross-brace so that the cross-brace connect
5 substantially at the front and top of the side frames
and bows forward from the connection point so that the
side frames can be pivoted towards each other and folded
substantially flat against the cross-brace;
- c) wheels mounted to the rear of the side
10 frames which roll perpendicular to the length of the
side frames, supporting the rear of the walker;
- d) wheels mounted to the front of the side
frames forward of the cross-brace, supporting the front
of the side frame; and
- 15 d) push handles mounted to the top of the
side frames substantially equidistant from the front and
rear wheels of the respective side frame.
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- 30
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Fig. 2

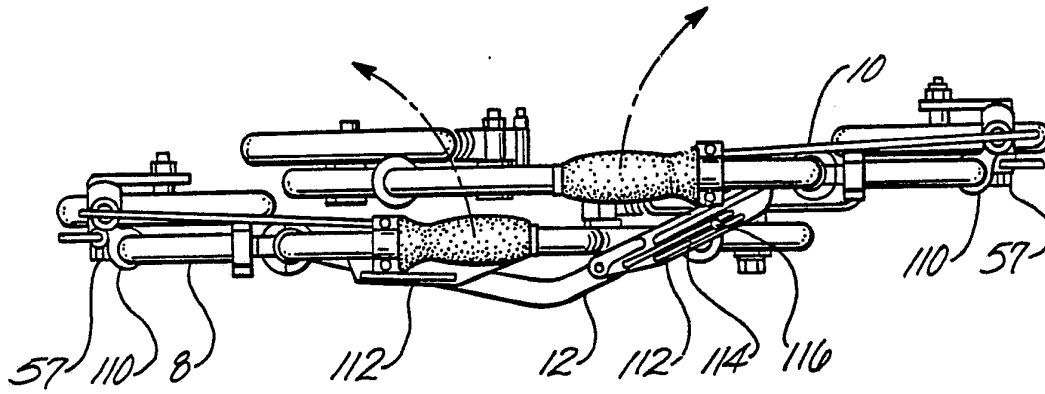


Fig. 3A

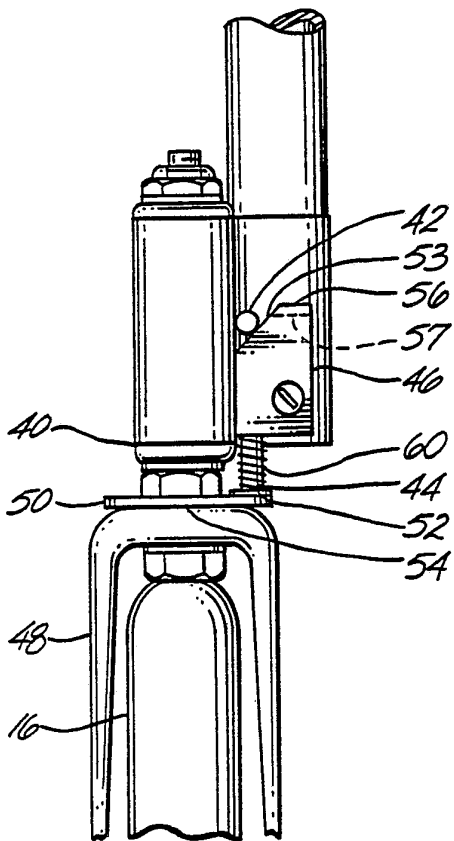
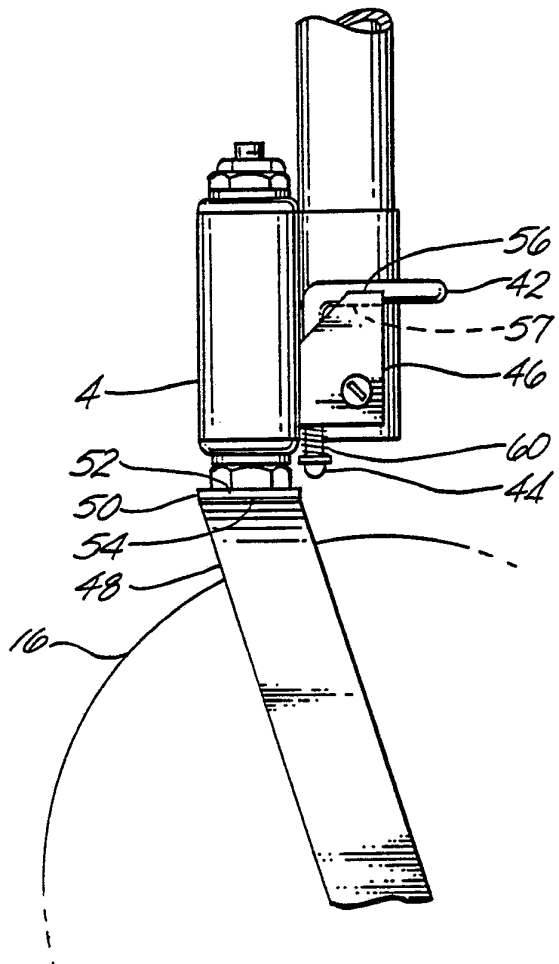


Fig. 3B



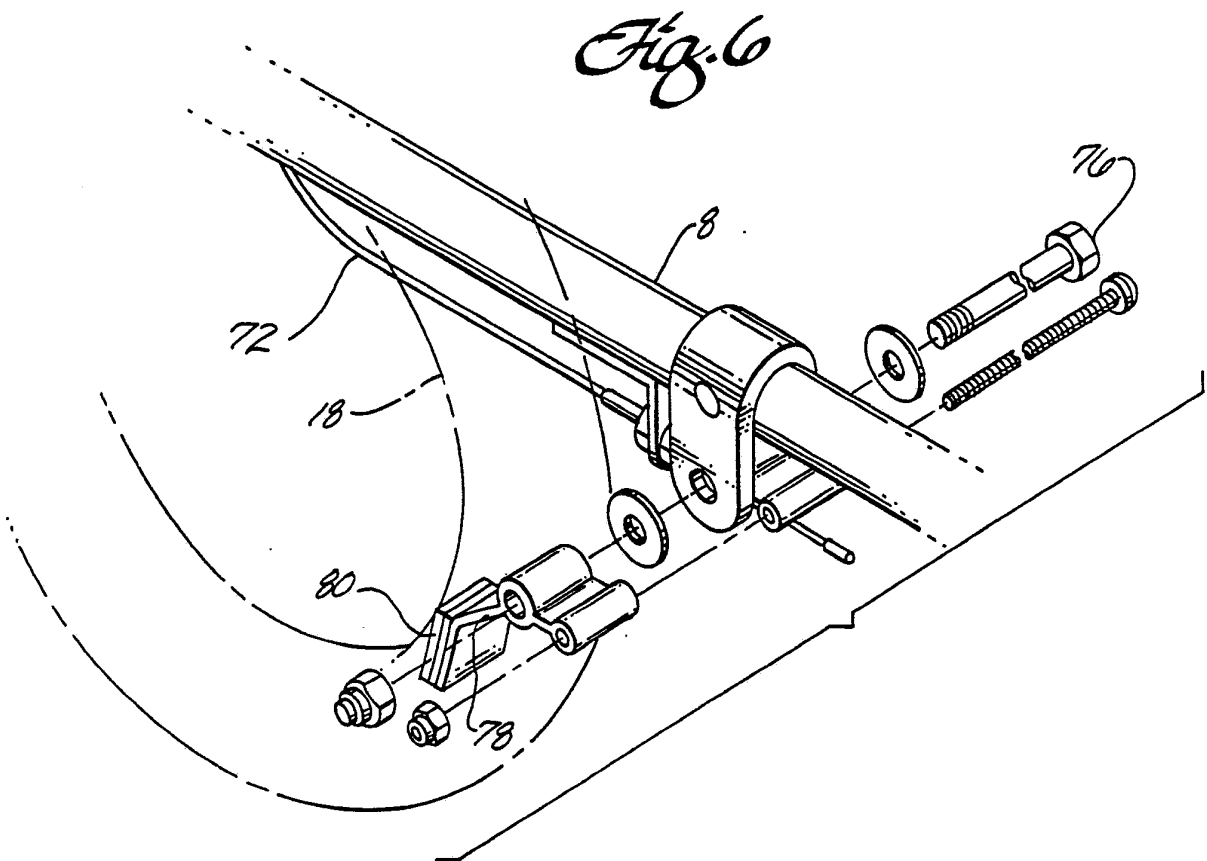
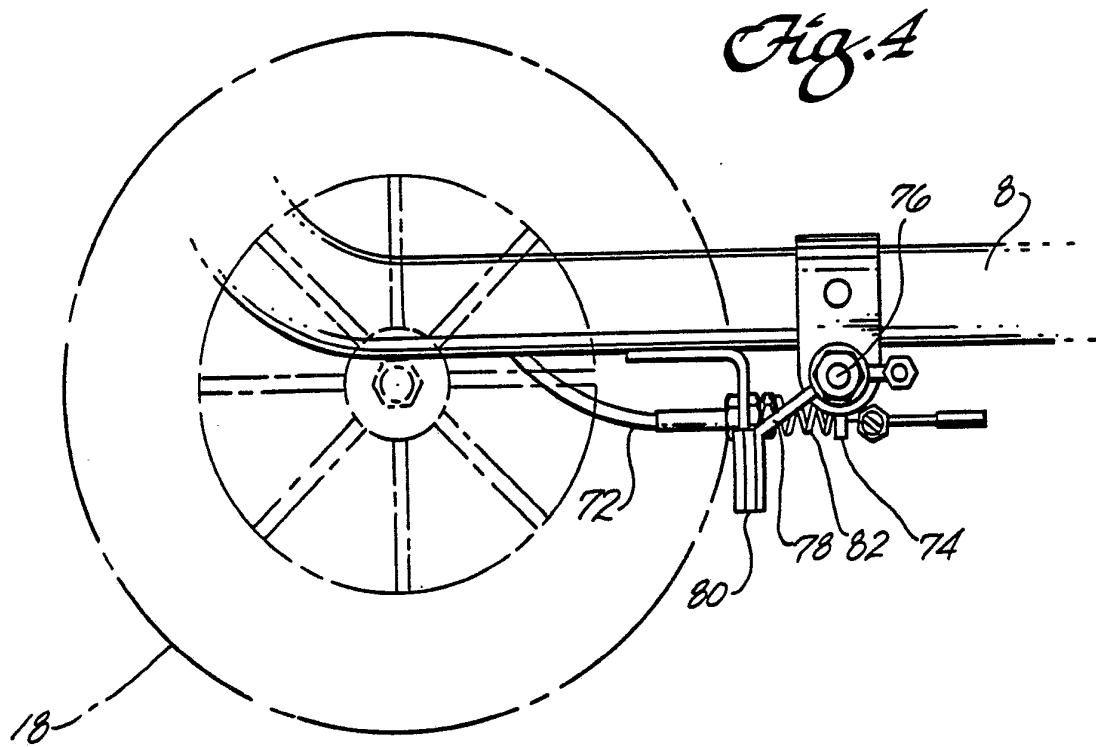
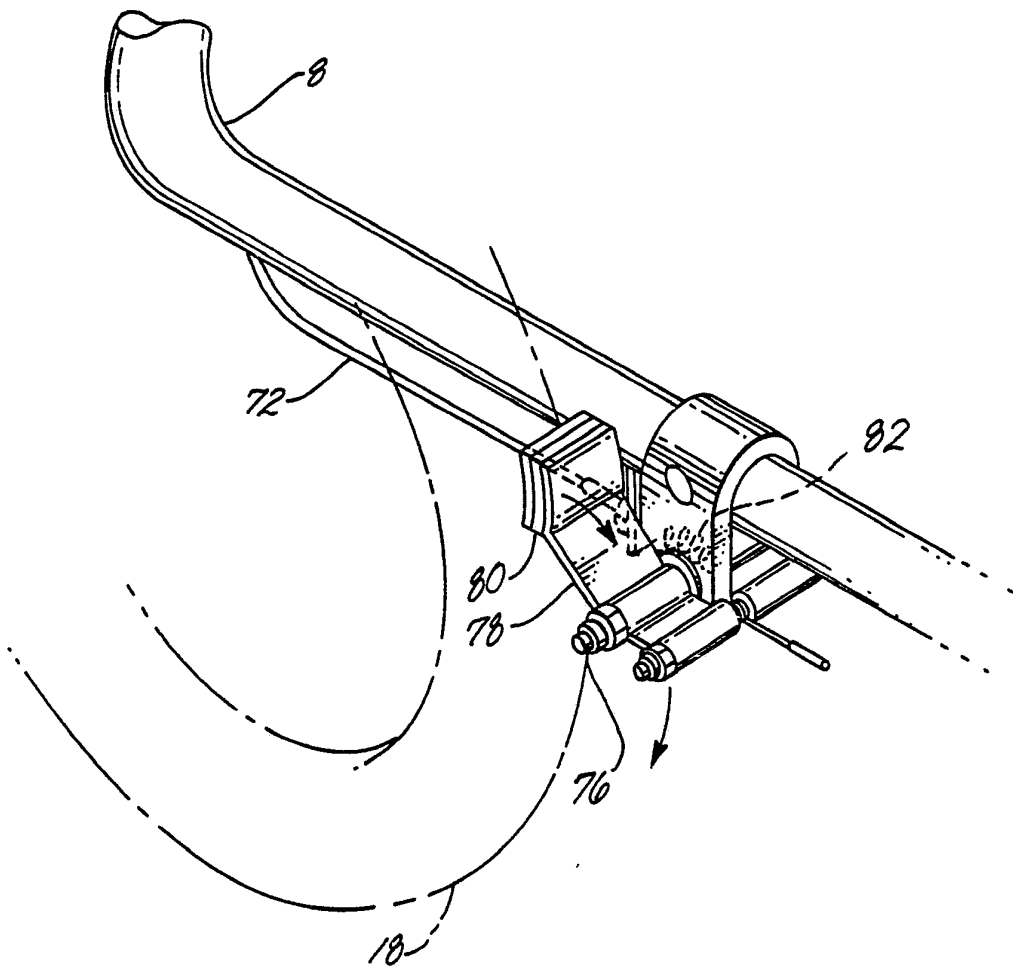


Fig. 5A



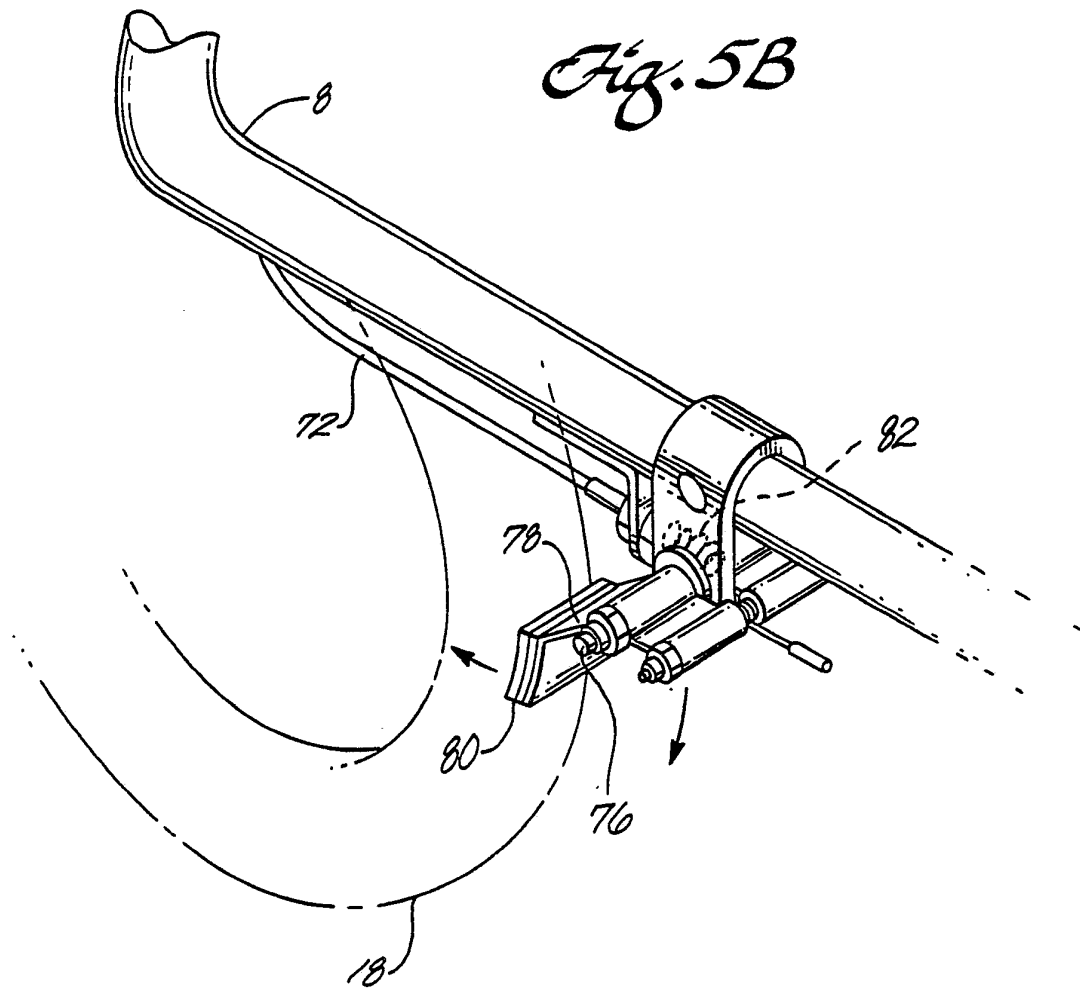
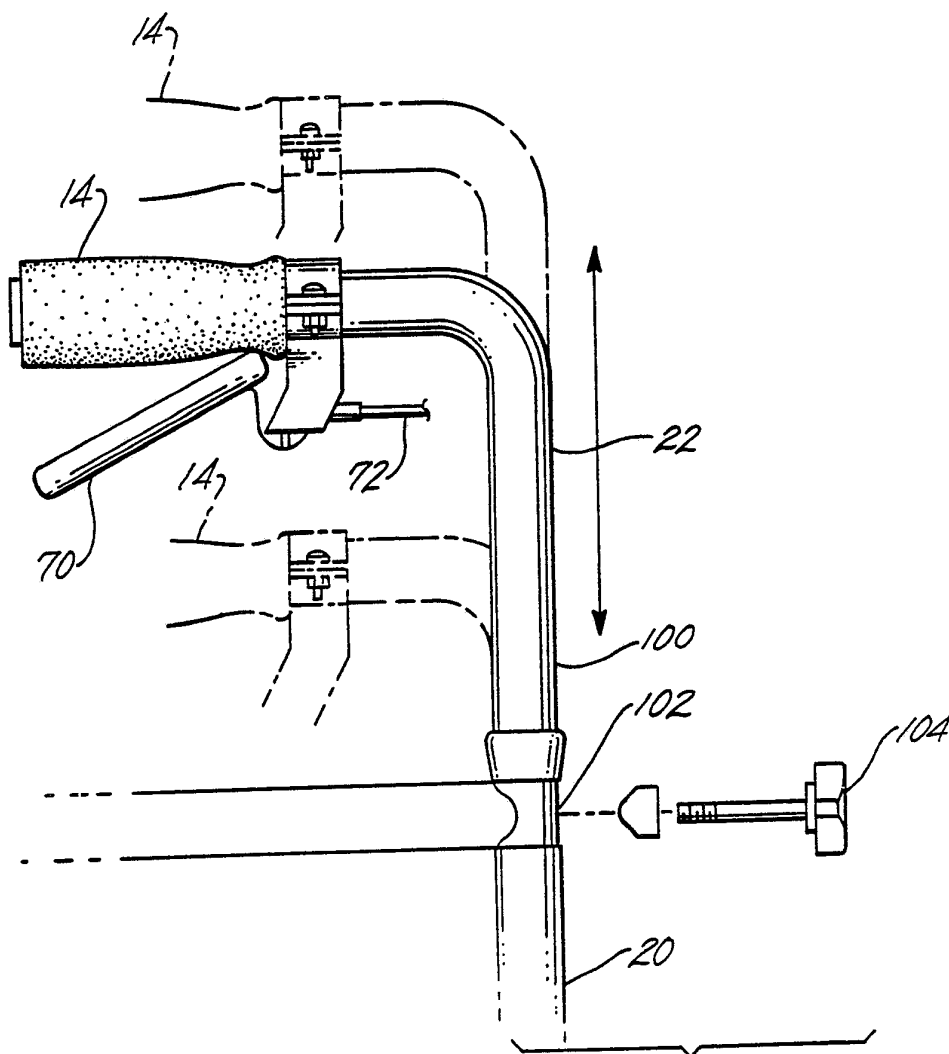
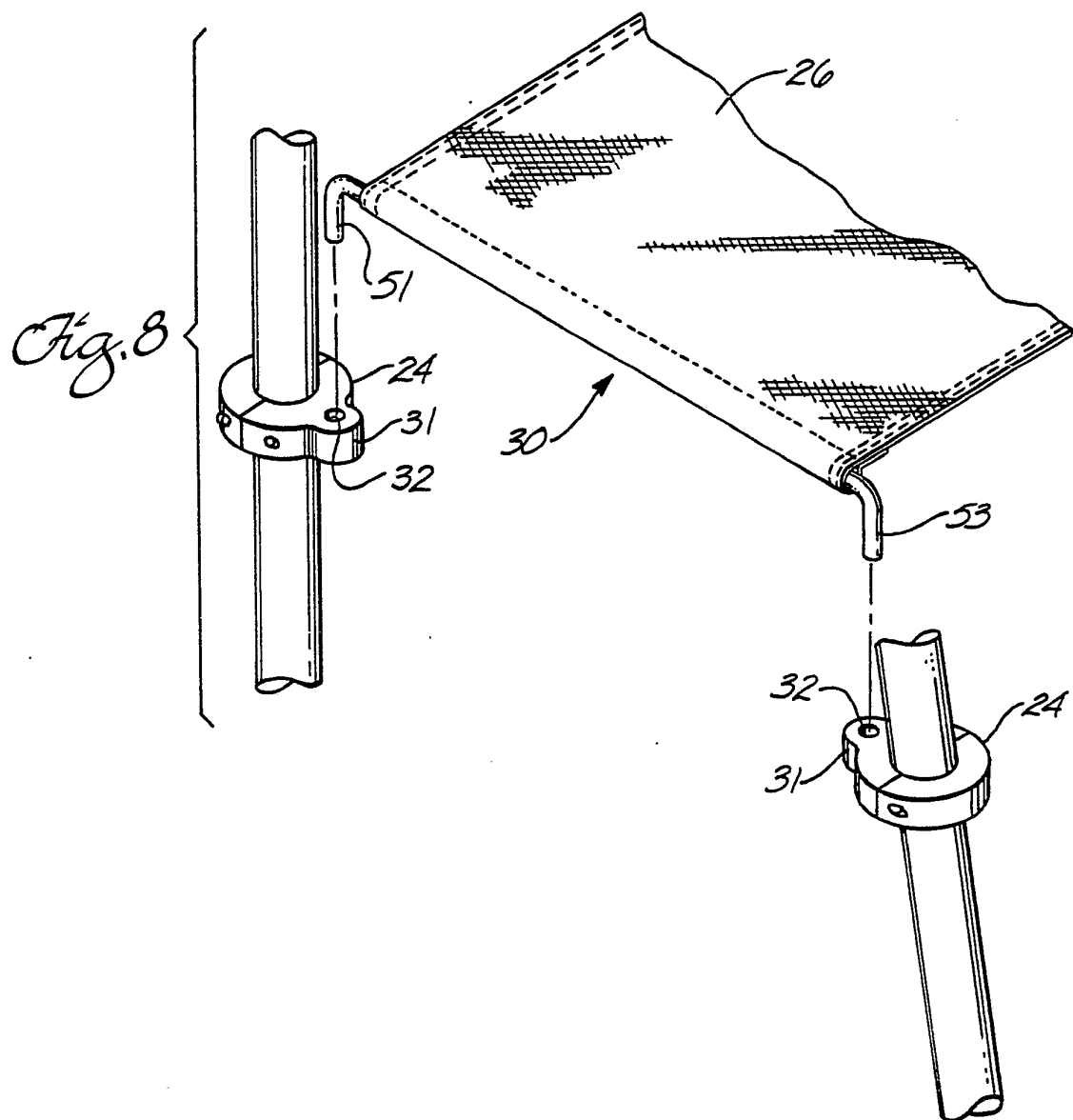


Fig. 7





SUBSTITUTE SHEET

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US88/04650

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC(4)	A63B21/00; A61H3/04	
US CL	272/70.3; 297/6	
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
	272/70.3,70.4; 135/67	
U.S.	297/5,6,441; 280/43.24	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	US,A, 3,237,940 (JOHNSON) 01 March 1966 See the entire document.	1-12
Y	US,A, 3,945,389 (SMITH) 23 MARCH 1976 See the entire document.	1-12
Y	US,A, 188,885 (FREDERICK) 27 March 1877 See figure 3 and column 2 lines 11-14.	6
Y	US,A, 1,917,440 (FINKBEINER) 11 July 1933. See page 1 lines 83-100 and page 2 lines 1-2.	7
Y	US,A, 4,277,100 (BEOUGHER) 07 July, 1981 See column 2, lines 51-63.	10,11
Y	US,A, 4,049,314 (MCGAFFIN) 20 September 1977 shows pin 44 and collar 40 attachment means. See Column 3 lines 37-42, 65-68.	10,11
<p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
02 February 1989		19 APR 1989
International Searching Authority		Signature of Authorized Officer
ISA/US		S.R. C.F.G.W. <i>A.R. Brown</i>