

[54] **FOLDING STROLLER**

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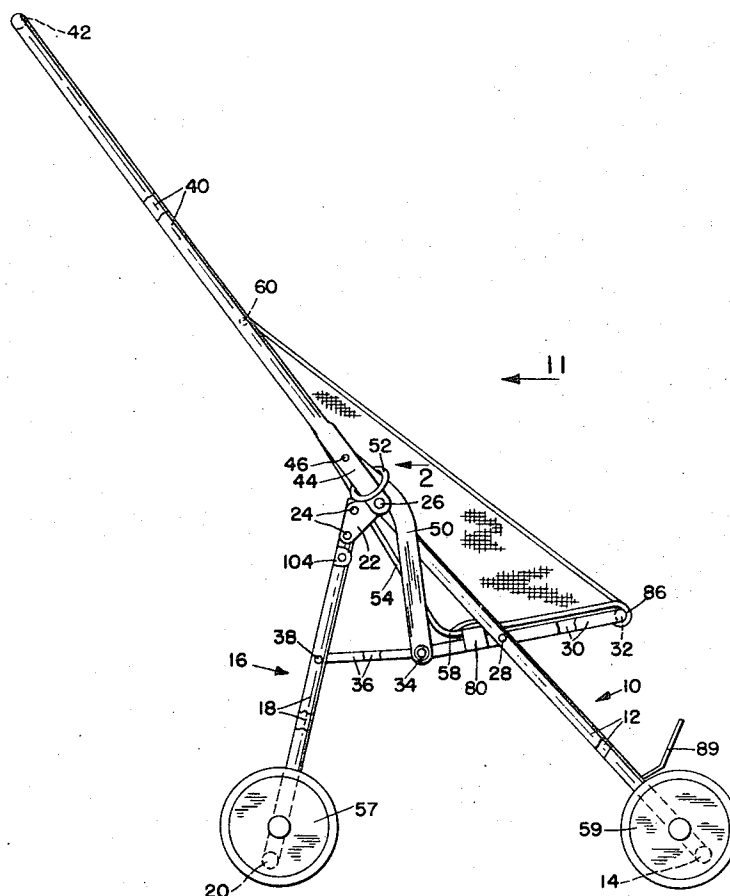
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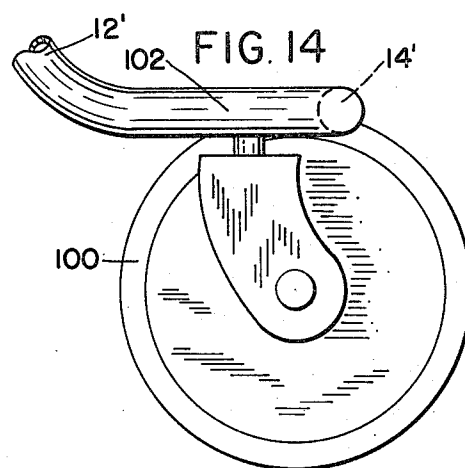
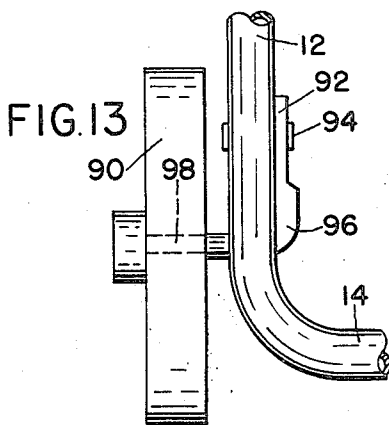
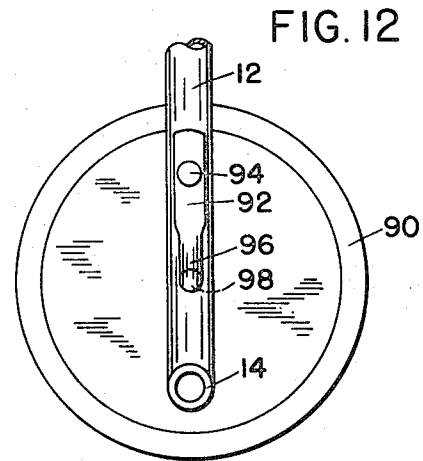
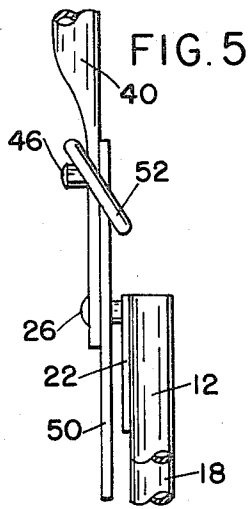
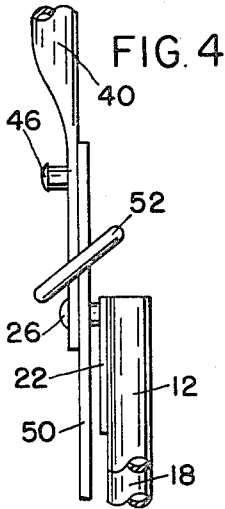
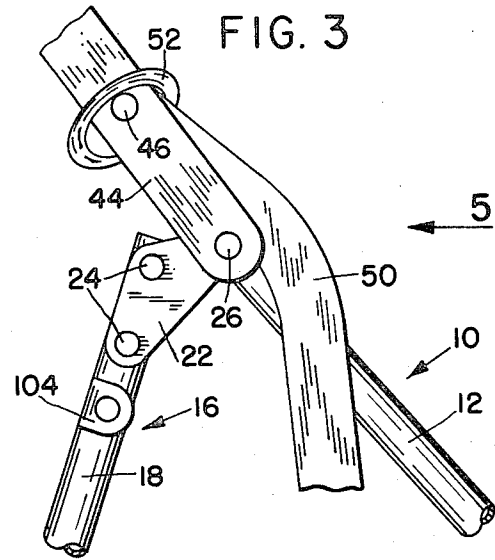
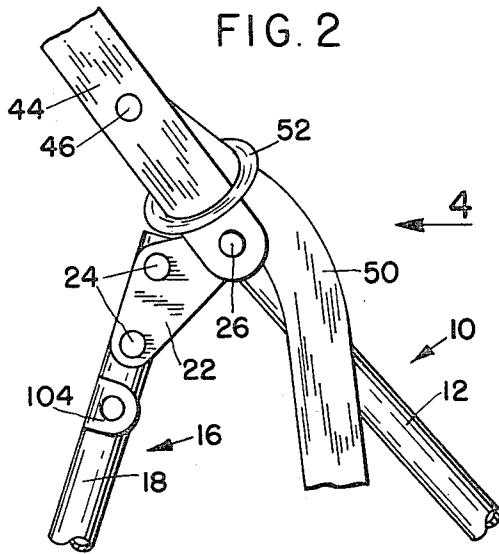
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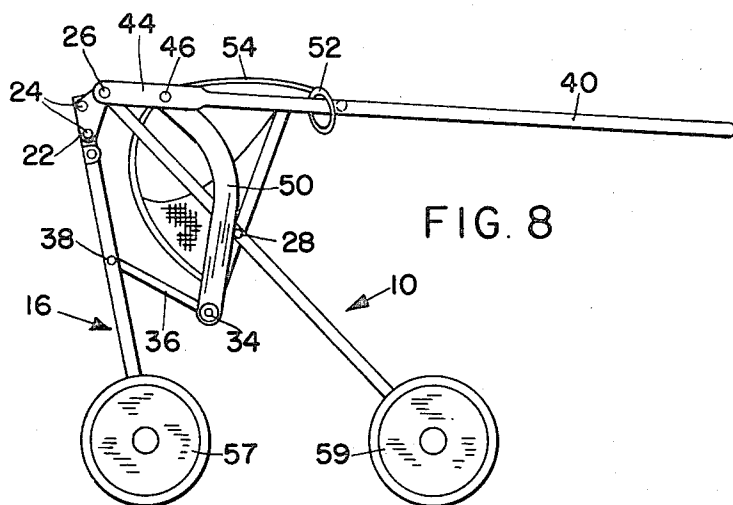
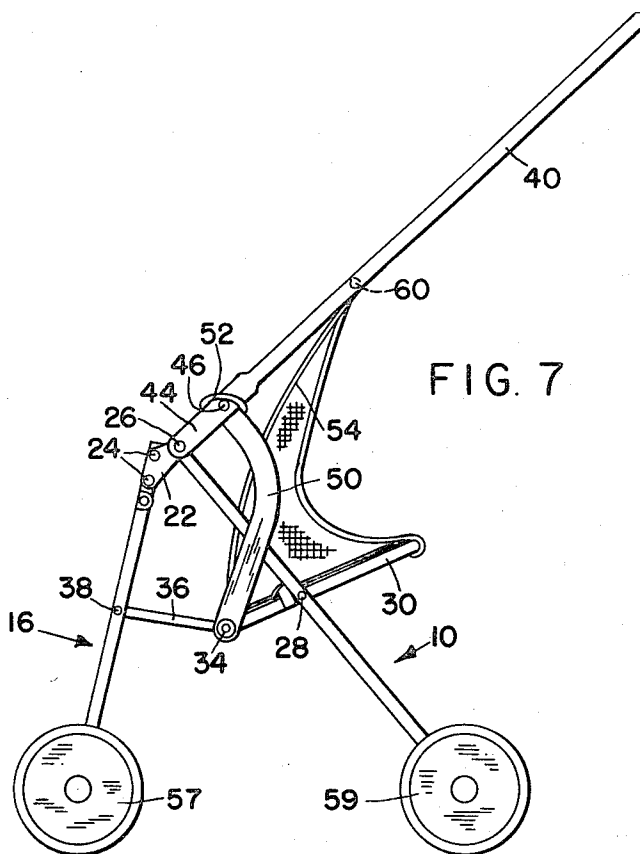
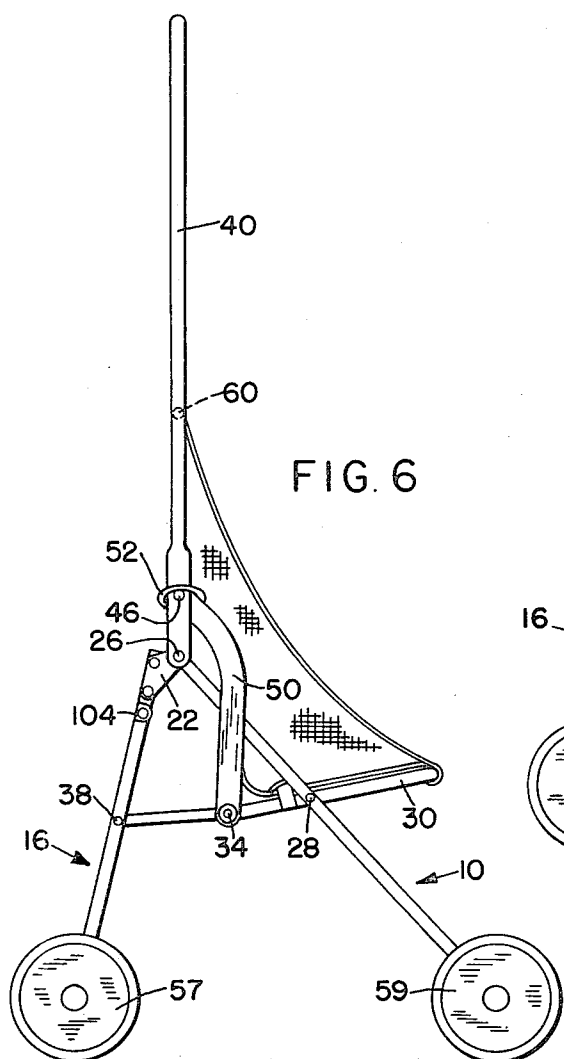
ABSTRACT

A light-weight folding stroller having for its principal characteristic that it is easily folded and erected by a one hand or a one arm operation. A pusher handle is pivoted with respect to a folding wheeled support having a seat, the support comprising a pair of inter-pivoted frames, in combination with a past dead center connection. When the pusher handle is moved to erect condition of the stroller, the connection has a part which overlaps the end of the pusher handle, receiving a gravity actuated loose ring latch which holds the entire structure erect. The rings are easily placed in an inoperative position when hung on pins extending from the sides of the pusher handle, whereupon a single push motion on the pusher handle folds the entire device. Likewise, a single pull on the pusher handle in the opposite direction erects the stroller and the ring latches are automatically actuated by gravity.

20 Claims, 14 Drawing Figures







SHEET 4 OF 4

FIG. 9

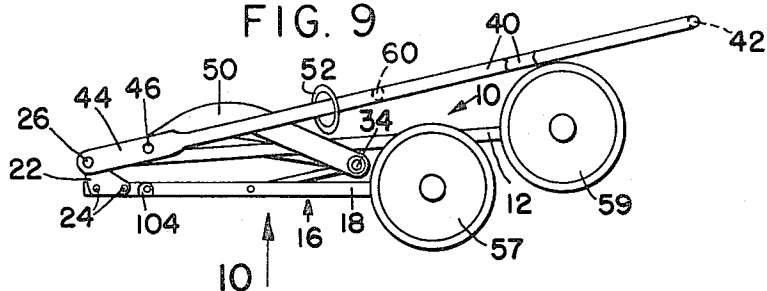


FIG. 10

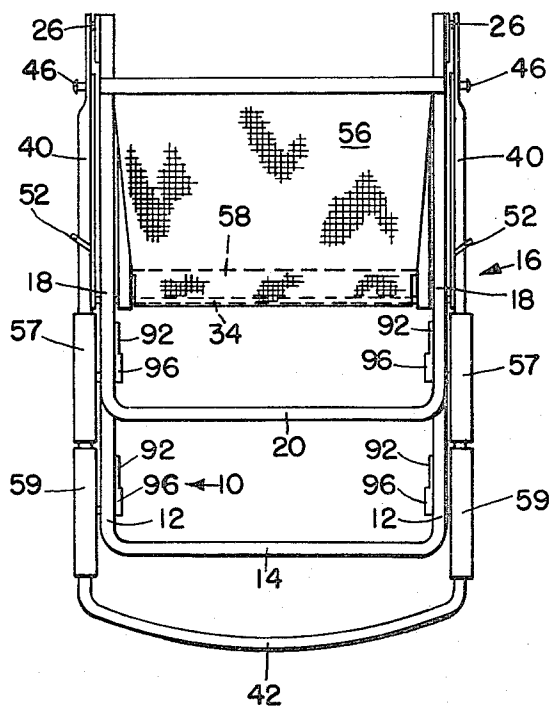
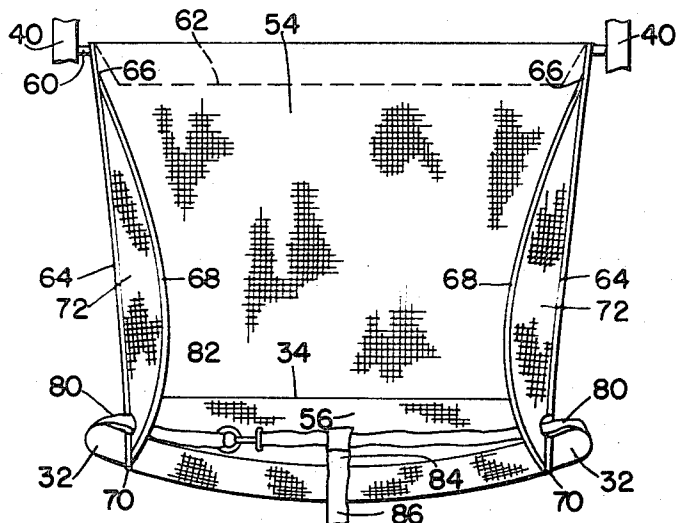


FIG. 11



FOLDING STROLLER

BACKGROUND OF THE INVENTION

Recently it has been a prime consideration in folding strollers to make them as easy to fold and erect as possible while at the same time reducing the weight to a degree still consistent with safety and sturdiness. A nurse is considerably at a loss at times as to where to place an infant in a safe location while necessarily using two hands for the double unlocking arrangement commonly found in these strollers. It has been found necessary to use two hands to both fold and erect any folding stroller that utilizes the usual double lock.

Recently one hand operation strollers have become available but these are for the most part relatively awkward both to operate and to carry, and operating on a principle similar to that found in folding wheel chairs. It is the principal object of the present invention to provide a single lock, easily operable stroller of very light weight but of a high degree of safety and sturdiness, and which follows closely the appearance of the prior art double lock strollers.

SUMMARY OF THE INVENTION

The folding stroller of the present invention embodies a front frame and a rear frame both of which are substantially U-shaped and both having a pair of spaced wheels thereon at the closed ends of the U's. These two U-shaped frames are conveniently formed of tubular material as is most of the stroller. The U frames are interpivotated at their free ends, i.e., the upper ends, to pins which form the centers of past dead center connections, one at each side of the stroller and embodying a bell-crank type of link pivoted at one end to the end of an arm of a U-shaped pusher handle extending in an opposite direction to the front and rear U-shaped frames, said links extending over the aforesaid center pins connecting the front and rear frames and extending downwardly where they are interpivotated with respect to a rod extending across the stroller. The pusher handle has connected thereto a backrest for the seat of the stroller.

The rod connects the rear open ends of the arms of a U-shaped frame for the seat, substantially mid-way between the front and rear U-shaped frames, there being a link at each end of the said rod interpivotated therewith and extending to and interpivotated with the two arms of the rear U-shaped frame.

When the stroller folds, the past dead center connections are broken and in turn break the interpivotated seat construction, moving the seat frame at its forward end upwardly and rearwardly folding it into the backrest member of the seat.

Adjacent the ends of the pusher handle arms the same are flattened and the pins which connect the upper ends of the bell-crank type links with respect to the pusher handle arms extend outwardly for a distance forming an abutment. There is a captive ring on each arm of the U-shaped pusher handle and when the stroller is erected, these pins fall by gravity down past the outwardly extending pins, and encompass the lower ends of the U-shaped pusher handle arms in the flattened area thereof, and also the upper portions of the bell-crank type links preventing them from separating and holding the upper end of the bell-crank type links in a past dead center position with respect to the afore-

said center pin which pivotally interconnects the front and rear frames.

By this means the stroller is held erect and the only latch means comprises the rings, in combination with the past dead center connections.

In order to fold the stroller, the rings are raised slightly and hung on the outwardly extending pins, thus releasing the bell-crank type links from being held locked in past dead center condition, whereupon the pusher handle may be moved forwardly, breaking the past dead center connection, and in turn causing the front and rear frames to approach each other until such time as the seat is completely folded substantially parallel with said front and rear frame and with the pusher handle.

The rear U-shaped frame is shorter than the forward U-shaped frame and folds and the wheels thereof fit inside of the wheels of the latter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in side elevation showing the stroller erect;

FIG. 2 is a enlarged view illustrating a ring in locking condition;

FIG. 3 is a view similar to FIG. 2 showing the ring in unlocking position;

FIG. 4 is a view in elevation looking in the direction of arrow 4 in FIG. 2;

FIG. 5 is a view in elevation looking in the direction of arrow 5 in FIG. 3;

FIG. 6 is a view similar to FIG. 1 illustrating the first step in the folding operation;

FIG. 7 illustrates a further folding action;

FIG. 8 shows the next to the last step;

FIG. 9 shows the stroller folded;

FIG. 10 is a bottom plan view of the completely folded stroller showing it in carrying position;

FIG. 11 is a view in front elevation illustrating the seat construction and looking in the direction of the arrow 11 in FIG. 1;

FIG. 12 is a detail view illustrating a mounting for the wheels;

FIG. 13 is a side view of FIG. 12; and

FIG. 14 is a detail view showing a different mounting for the front wheels.

PREFERRED EMBODIMENT OF THE INVENTION

In the embodiment of the invention disclosed herein there is a front U-shaped frame generally indicated by the reference numeral 10 and comprising a pair of spaced arms 12, 12 connected by a closed end portion 14, forming the U-shape. There is a similar rear frame indicated generally by the reference numeral 16 and comprising arms 18, 18 also connected as by a closed end member 20, forming the rear U-shaped frame. These frames are interpivotated by means of a plate 22 which is solidly connected as by rivets 24 to the arms 18 of the rear frame 16 and by a pivot pin 26 to the arms 12 of the front frame 10. It will be realized that the front frame 10 is longer than the rear frame 16 so that when the stroller is in extended condition as in FIG. 1 the frame 10 is at a lesser angle to the horizontal than is the frame 16.

Pivoted intermediate the arms 12 of the front frame 10 as at 28 there is another U-shaped frame comprising side members 30, 30 also having a closed end member

as at 32 to form the U-shape. The pivot at 28 is intermediate the side members 30, 30 of the seat frame and these members extend to the rear of the front frame member 10, the ends thereof being connected by a rod indicated at 34. On the rod 34 adjacent the ends thereof are a pair of links 36, 36 which extend to the rear being pivoted intermediate the arms 18 of the rear frame 16 as at 38. A U-shaped pusher handle having elongated side members 40, 40 and connected by a closed end member 42. The side members 40, 40 are flattened at their ends as indicated at 44, for a distance inwardly from the extreme ends thereof, which are pivoted on pins 26. Spaced therefrom on the flattened area 44 is an outstanding pin 46 which does not extend out quite as far as the outside dimensions of members 40, the latter being conveniently made of light weight tubular material, and attention is directed to FIGS. 4 and 5 illustrating the relation between the pins and members 40, 40.

Pivoted on the outstanding pin 46 which is fixed position, there is a bell-crank type of link indicated at 50 and this link extends downwardly as seen in FIG. 1 being picoted at its lower end as on the rod 34.

It will be noted that in FIG. 1 the bell-crank type link 50 straddles the pivot 26 and contacts the same forming a past dead center device which must be broken in order to fold the stroller. This can be done by pushing the pusher handle 40 forwardly, i.e., in a clockwise direction in FIG. 1. This action is inhibited by means of relatively loose annular rings 52 loosely slidable, one on each of the side members 40, 40 of the pusher handle. In the position shown in FIG. 1 and also on an enlarged scale in FIG. 2, the ring shown being held in position by gravity wherein it embraces the pusher handle in its flattened area at 44 as well as the upper rearwardly extending end of the bell-type link 50. With the ring in this position, any forward motion of the pusher handle is clearly inhibited by the past dead center connection. That is, the tendency of pusher handle 40 to move clockwise in FIGS. 1 and 2, necessarily puts a strain on the pin 46 tending to urge it in the same direction and this of course then tends to urge the upper end of bell-crank type link 50 in the same direction, which is impossible because the ring does not allow such a motion.

However upon manually lifting the rings to hang on the pins 46 as in FIGS. 3 and 5, the past dead center connection can now be easily broken merely by manually pushing the handle 40, 40 in the clockwise direction as above explained. In this condition, the ring presents no obstacle to the relative motion of the bell-crank type links 50.

When this is done, as seen in FIG. 6, the pusher handle 40, 40 moves relatively speaking to the right as does the upper end of the link 50, and the cloth seat which is to be later described starts to fold. The pivot point at (the rod 34) is not affected in the FIG. 6 position but starts to break downwardly as shown in FIG. 7, so that the seat frame 30 and the rearwardly extending links 36 pivot counterclockwise and clockwise respectively, so that the front frame 10 and the rear frame 16 now start to move toward each other. Continued motion of the pusher handle frame 40 causes the seat frame 30 to move counterclockwise as the pivot point at 30 moves relatively downwardly and forwardly, see FIG. 8. The fabric of the backrest which is indicated in FIG. 8 at 54 now assumes a relatively U or V-shaped formation, be-

cause it is flexible, and eventually when the parts are completely folded, see FIG. 9, the seat frame 30, and seat 56, are folded in a reverse direction completely within the fabric of the backrest 54; and the lower end of frame 16 is substantially nested within the frame 10, it being noted that the respective wheels 57 and 59 are substantially nested, although the members 10 and 16 do not come exactly to a parallel condition but substantially so, and the same is true of the pusher handle 40.

Referring to FIGS. 7 and 8, with the parts substantially in the positions shown, it is possible to merely push in to the right on the rear frame 16 rather than completely pushing the pusher handle 40 downwardly as far as it will go, and as a matter of fact the folding action from either FIG. 7 or FIG. 8 to the finally folded condition of FIG. 9 is extremely easy and may be accomplished by pushing the pusher handle fully downwardly or by lifting the entire device and pushing together the frames 16 and 10.

In addition it will be seen that the following action can be done with one hand because the rings are loose and are easily picked up one at a time by the one hand and hung onto respective pins 46 whereupon the only action then necessary to completely fold the stroller is to push the pusher handle 40 in a clockwise direction as described.

The same thing is true in erecting the stroller. To erect the stroller, the pusher handle 40 is merely grasped along its closed end at 42, see FIG. 9, to move upwardly, i.e., in a counterclockwise direction. The views shown in FIGS. 8, 7, and 6 as well as FIG. 1, will then be repeated, but in this case the rings 52 fall down by gravity automatically past the pins 46 because the latter do not extend out to the fullness of the tubular members 40, 40 and this is plainly illustrated in FIGS. 4 and 5. The action of the rings in this connection is completely automatic and nothing has to be done by the operator.

The seat frame 30 is U-shaped having the forward member 32 forming the forward edge portion thereof and this is preferably bowed slightly in order to form a more comfortable seat, see FIG. 11. The fabric of the seat is folded over the member 32 and sewed to form a seam enclosing the member 32. The seat fabric then extends toward the rear as at 56, FIG. 11, and passes under rod 34 and then upwardly to form the backrest portion 54.

A seam is formed at 58 so that the rod 34 is enclosed by the fabric and forms a taut seat between the member 32 and rod 34 as well as a relatively taut backrest 54 between the rod 34 and a rod 60 extending between the arms 40, 40 of the pusher handle. The backrest 54 is extended to cover rod 60 by a seam 62.

The edges of the backrest 54 and seat 56 are selvaged by a binding which is indicated in FIG. 11 at 64, 64. Under this binding as at 66, 66 another binding 68, 68 extends downwardly being tucked into and secured to the binding 64 adjacent to the forward portion 32 of the seat member 56 as at 70, 70; and additional cloth panels 72, 72 in triangular form are secured between bindings 64 and 68 on both sides of the seat forming side walls for the seat. Because the binding is so stitched to the seat, back and side panels, the side panels naturally fold in toward each other. The panels, folding inwardly, become encompassed by the seat and

the backrest in the fully folded condition of the stroller in FIGS. 8 and 10.

A safety strap is provided. The safety strap comprises an adjustable waist belt connected at its ends to the seat members 30, 30 as at 80, see FIG. 11. This waist band is indicated at 82. It has a crotch connection 84 connected at 86 to the seat, passing over the forward portion of the seat. This provides a very safe waist band because it is connected at key points to the seat, thus positively holding the child in position.

A footrest 89 may be provided as conventional. Also, a canopy or other top can be used and a conventional type of reclining or adjustable back may be substituted on the one motion folding device, if desired.

Referring now to FIGS. 12 and 13, the wheel mounting is illustrated. It will be seen that for instance the frame members 12 extend downwardly well below the axis of the wheels 90 and the cross piece 14 is very low to the ground forming a more solid structure for the stroller. The wheels are mounted by providing flattened plate 92 riveted at 94 to members 12 and then extending as at 96 in full rounded form through the member 12 and forming an axle 98 for the wheels 90.

Another form of mounting the wheels is illustrated in FIG. 14 showing swivel wheels 100 mounted in the manner of casters on the lower portion of the frame at 14' which extends forwardly over the wheels, so that it will be seen that the stroller construction may be adapted to the rigidly mounted wheels of the previous description in FIGS. 12 and 13, but in case that swivel wheels are desired, this can be done merely by changing the front frame from the construction as represented by the reference numeral 12 to those represented by 12' and 14'.

A carrying strap 104 is provided for ease in single handed carrying of the folded stroller. While the stroller is easily carried by the cross member 42 of the pusher handle, or by the front cross piece 32 of the seat, it balances better with fabric strap 104 as a handle. This strap is located just above the cross member 32 in folded condition of the stroller, and is opposite the cross piece 42 of the pusher handle.

I claim:

1. A stroller comprising a front frame, a rear frame, a pusher handle frame and a seat frame, all of said frames including side members, the front and rear frames and the handle frame being pivoted together at their respective end portions, wheels journaled to the lower end portions of said front and rear frames, the seat frame being pivoted intermediate the ends of its side members to the front frame below said respective end portions and having a portion thereof extending toward the rear frame, links pivoted intermediate the ends of the rear frame and also being pivoted with relation to the rearwardly extending portion of the seat frame, and a second link pivoted at one end to the pusher handle frame above said respective end portions and at the other end to the seat frame at the rearwardly extending portion thereof,

the second link comprising a past dead center connection when the stroller is erect and holding the frames against folding.

2. The stroller of claim 1 wherein the pusher handle frame is adapted to break the past dead center connection to fold the frames upon a swinging motion forwardly toward the front frame.

3. The stroller of claim 2 including releasable latching means preventing relative motion of the second link and the pusher handle frame.

4. The stroller of claim 3 wherein the releasable latching means comprises a continuous member slidable on the pusher handle frame and engageable over the second link.

5. The stroller of claim 3 wherein the releasable latching means comprises a movable ring.

6. The stroller of claim 5 wherein the ring is slidable on one of the side elements of the pusher handle frame.

7. The stroller of claim 6 wherein said ring is held by gravity in position latching the pusher handle frame and the second link.

8. The stroller of claim 3 wherein said releasable latching means comprises a gravity-operated ring and including means for supporting the ring in non-latching condition releasing the pusher handle frame for folding the stroller.

9. The stroller of claim 8 wherein said ring supporting means comprises a pin extending laterally from a pusher handle frame side member.

10. The stroller of claim 9 wherein the pusher handle side member has a reduced portion, the pin being located in the reduced portion.

11. The stroller of claim 9 wherein said pin forms the pivot for the second link and the pusher handle.

12. The stroller of claim 10 wherein the pin terminates in a free end short of the corresponding dimension of the respective unreduced portion of the pusher handle frame side element so that the ring when above the pin will fall by gravity past the pin automatically into latching position of the pusher handle side member and the second link.

13. The stroller of claim 11 wherein the pusher handle side member is hollow tubing and the reduced portion is flat.

14. The stroller of claim 1 including transverse members at the lower end portions of the front and rear frames connecting the respective side members, and axles for the wheels located above the said respective transverse members on the front and rear frames.

15. The stroller of claim 14 wherein said axles each comprises a rod having a flattened portion secured to the inside aspect of the respective side members of the front and the rear frames and extending down along the same to a point above the transverse members of the front and rear frames, and terminating in a right angle bend extending through a side member of each of the front and rear frames, protruding to the outside aspects thereof, the wheels being mounted on the protruding portions thereof.

16. The stroller of claim 1 wherein the front frame is provided with a cross member at the lower portion thereof, said cross member being at the ends of the side members of the front frame, and casters depending from said cross member adjacent the side members.

17. The stroller of claim 1 including a carrying strap extending between the side members of the rear frame, and means securing the strap to the side members thereof, said carrying handle being located just above the position of the seat frame in folded condition of the stroller.

18. A folding stroller comprising a front frame including spaced elongated side members, a rear frame comprising spaced elongated side members, means piv-

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oting said frames adjacent corresponding ends thereof, wheels journaled to the other ends of said front and rear frames, a seat frame including side members pivoted between the side members of the front frame below said corresponding ends intermediate the lengths of the side members of the seat frame, a rear cross rod on said seat frame, a link pivoted to said rod and to an intermediate portion of a side member of the rear frame,

a pusher handle frame, means mounting the latter to pivot with respect to the front and rear frames, and a second link pivoted to the pusher frame at a spaced position from the pivot axis of the pusher

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frame, said second link being pivoted at its opposite end to the rear cross rod on the seat frame, and releasable means latching said second link and the pusher frame against folding.

19. The stroller of claim 18 wherein the means pivotally mounting the pusher handle frame and the two pivots of the second link comprise a past dead center locking device, the latching means preventing breaking of the past dead center device until the latching means is released.

20. The stroller of claim 19 wherein the releasable latching means comprises a gravity actuated ring.

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