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(54) **Title:** SIDE-BY-SIDE STROLLER WITH IMPROVED STEERING AND HANDLING

(57) **Abstract:** Improved tandem side-by-side strollers are shown and described. The improved strollers have three frames including two side frames any middle frame. The frames are connected together by two types of spreader bar mechanisms including to horizontal spreader bar mechanisms and to vertical spreader bar mechanisms. Both horizontal and vertical spreader bar mechanisms are used to connect each side frame to the middle frame. The middle frame is pivotally connected to a steering handle assembly. The steering handle assembly is ergonomically designed with one or more cup holders. All three frames include an inverted v- shaped configuration with a front leg and a rear leg. The centralized, ergonomically designed steering handle and overall design of the three frames and spreader bar mechanisms provide for a side-by-side tandem stroller with improved steerability and handling. The stroller also collapses easily for storage and transport.

SIDE-BY-SIDE STROLLER WITH IMPROVED STEERING AND HANDLING

BACKGROUND

Technical Field

[0001] An improved infant stroller is disclosed for carrying two infants is disclosed. The disclosed tandem strollers are arranged in a side-by-side fashion with a central steering column and centralized, ergonomic steering handle for improved steerability and maneuverability.

Description of the Related Art

[0002] Strollers have become essential for use in the transportation of infants and small children. Stroller designs have proliferated, resulting in more ergonomical, stable and less bulky alternatives. However, strollers designed for two or more infants remain awkward and problematic.

[0003] Specifically, the stroller industry's attempted solution has been to offer a double or tandem stroller. Typically, the strollers are arranged in a side-by-side fashion. However, while ideally suited for carrying two infants or small children of approximately the same size, the tandem strollers are awkward to push and control when transporting children of different sizes or weights because of lack of balance and alignment in such situations. Further, because of the width of these tandem strollers, the lack of steerability presents an acute problem when the parent is attempting to maneuver the stroller in a public environment, such as a crowded retail store or a busy restaurant.

[0004] Because tandem strollers are so large and wide, they must be collapsible for transportation and storage purposes. Such collapsible strollers are known as "umbrella" strollers. An umbrella stroller is a stroller that includes lengthwise frames that collapse laterally. The

stroller frames are connected by a spreader bar mechanism that holds the frame components apart and that permit folding of the frames together. Typically, an umbrella stroller is folded by moving the cross bars of a spreader bar of mechanism upwardly so that the frames collapse and permit the side frame halves to move together. For safety purposes, locking mechanisms are generally associated with a spreader bar mechanisms in order to prevent accidental release of the mechanism and premature collapsing of the frames.

[0005] An example of a tandem umbrella stroller can be found in U.S. Patent No. 5,221,106. However, while the design of this patent is collapsible, it suffers from problems commonly associated with tandem strollers, that is a lack of steerability and poor handling. Further, the spreader bar mechanisms are crude, making it difficult to collapse.

[0006] Two more tandem strollers are shown in Figs. 1 and 2. Fig. 1 illustrates an umbrella tandem stroller 10 whereby two steering handles 11, 12 are provided as extensions to the outer side frames 13, 14 respectively. The steerability of the stroller 10 is limited or difficult as the handles 11, 12 are separated by a wide distance thereby necessitating greater strength to turn the stroller 10 to the right or to the left. Thus, the stroller 10 is difficult to steer and requires greater strength than many users have. Even if the user has enough strength to steer the stroller 10, steering the stroller 10 can cause fatigue quickly making the stroller unpleasant to use. Further, the rear wheels are frequently stepped on by the user causing embarrassment and/or possible injury.

[0007] Turning to Fig. 2, the stroller 20 includes three handles 21, 22, 23, attached to the three frames 24, 25, 26 respectively. The handles 21, 22, 23, while not as far apart as the handles 11, 12 shown above in connection with Fig. 1, provide little or no improvement over the steering

handles 11, 12 of Fig 1. Specifically, if the user grabs the pair of handles 21, 22 or the pair 22, 23, the steering force exerted will not be evenly distributed across the stroller 20 and therefore turning the stroller 20 using either the right pair of handles 21, 22 or left pair of handles 22, 23 can be difficult or strenuous, particularly when heavy children are being transported. Further, using the outer handle pair 21, 23 presents the same problems discussed above with respect to awkwardly spaced apart handles 11, 12 of the stroller 10 of Fig. 1. Finally, none of the handles illustrated in Figs. 1 and 2 are ergonomically designed making these strollers difficult and unpleasant to use, particularly in crowded public places.

[0008] Therefore, what is needed is a device that maintains the collapsibility of umbrella, tandem strollers, while providing the carrying capacity of tandem strollers, and that provides improved steering and handling, especially for smaller users who have limited strength.

SUMMARY OF THE DISCLOSURE

[0009] In satisfaction of the aforenoted needs, improved tandem strollers having a side-by-side arrangement are disclosed.

[0010] In an embodiment, a side-by-side tandem stroller is disclosed which comprises two side frames with a middle frame disposed therebetween. Each side frame is connected to the middle frame by a horizontal spreader bar mechanism and a vertical spreader bar mechanism. The middle frame is connected to a steering handle assembly. The middle frame is integrally connected to the steering handle assembly. Each frame is connected to front and rear wheels. The rear wheel or wheels of the middle frame are smaller in diameter and disposed forward of the rear wheel of the side frames to create additional space for the user to step into.

[0011] The centralized steering handle assembly allows the user to maneuver the stroller with their hands at a normal and comfortable width, similar, but even more comfortable to the handle configuration of a single stroller and, in contrast to the uncomfortable position required by the prior art dual strollers as shown in Figs. 1 and 2. The centralized steering mechanism of the dual stroller disclosed herein provides improved steerability, better handling and less effort or strength required to turn the disclosed stroller thereby making life much easier for any parent or caretaker of two small children or babies.

[0012] In a refinement, each side frame and the middle frame comprise a front leg connected at an apex to a rear leg. Each horizontal spreader bar mechanism connects the front leg and rear leg of one of the side frames to the front and rear legs of the middle frame. Each vertical spreader bar mechanism connects the rear leg of one of the side members to the rear leg of the middle frame.

[0013] In another refinement, the rear leg of the middle frame is disputed forward of the rear legs of the side frames to create more space for the user to step into.

[0014] In another refinement, the front leg of the middle frame extends upward beyond the apex of the middle frame and terminates at an upper distal end. The upper distal end of the middle frame is connected to the steering handle.

[0015] In a refinement, the steering handle is pivotally connected to the middle frame. In further refinement of this concept, the steering handle is pivotally connected to the front leg of the middle frame.

[0016] In a refinement, the apex connection between the front and rear legs of the middle and both side frames are rigid connections.

[0017] In a refinement, the connections between in the side frames and the middle frame by the horizontal and vertical spreader bar mechanisms are collapsible, meaning that the side frames can be collapsed toward the middle frame for storage and transport.

[0018] In a refinement, the steering handle is part of a steering handle assembly which may comprise one or more cup holders. In a further refinement of this concept, the steering handle assembly includes two cup holders or a pair of side-by-side cup holders.

[0019] In another refinement, the steering handle is generally oval-shaped or round for ergonomic considerations.

[0020] In a further optional refinement, the steering handle is pivotally connected to the front leg of the middle frame so that it may be pivoted from a generally horizontal position, to a vertical position or towards the front leg of the middle frame. In a further refinement of this concept, the steering handle assembly comprises a ratchet mechanism for adjusting the pivotal position of the steering handle with respect to the front leg of the middle frame and locking the steering handle in place in the chosen position.

[0021] In a refinement, the horizontal spreader bar mechanisms include two legs, one leg connecting the rear leg of its respective side frame to the front leg of the middle frame and another leg connecting the rear leg of the middle frame to a front leg of the side frame. Preferably, each horizontal spreader bar mechanism includes a pivotal connection between the two legs which assists in the collapsing and expanding of the strollers.

[0022] In another refinement, and the vertical spreader bar mechanisms comprise seven legs, including a central vertical leg disposed between three pairs of lateral legs extending from the central vertical leg to the rear leg of our either a side frame or the rear leg of the middle frame.

Pivotal connections are provided between each pair of links that extend laterally outward from the central vertical leg facilitate the collapsing and expanding of the stroller.

[0023] Preferably, the disclosed stroller includes a total of four spreader bar mechanisms including two vertical spreader bar mechanisms connecting the rear leg of the side frames to the rear leg of the middle frame, and two horizontal spreader bar mechanisms for connecting the front and rear legs of the side frames to the front and rear legs of the middle frame.

[0024] In another refinement, a pair of axially connected wheels are attached to lower distal ends of each of the front and rear legs of the middle frame in the front and rear legs of the side frames.

[0025] Preferably, the improved tandem stroller frame disclosed herein provides two infant seating areas, an umbrella for each infant and storage space disposed below each infant.

[0026] Further advantages and features will be apparent from the following detailed description when read in conjunction with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] For a more complete understanding of the disclosed methods and apparatuses, reference should be made to the embodiment illustrated in greater detail on the accompanying drawings, wherein:

[0028] Fig. 1 is a front plan view of a prior art tandem stroller with a pair of steering handles;

[0029] Fig. 2 is a perspective view of another prior art tandem stroller with three separate hook-shaped steering handles;

[0030] Fig. 3 with is a perspective view of a side-by-side tandem stroller frame and steering handle made in accordance with this disclosure;

[0031] Fig. 4 is a front plan view of the stroller frame shown in Fig. 3;

[0032] Fig. 5 is a right side view of the stroller frame of Fig. 3;

[0033] Fig. 6 is a rear plan view of the stroller frame of Fig. 3;

[0034] Fig. 7 is a top plan view of the stroller frame of Fig. 3;

[0035] Fig. 8 is a bottom plan view of the stroller frame of Fig. 3;

[0036] Fig. 9 is a front perspective view of the stroller frame of Fig. 3, with the infant carrying seat and umbrella elements installed;

[0037] Fig. 10 is a side plan view of the stroller frame of Fig. 3, with the infant carrying seat and umbrella elements installed;

[0038] Fig. 11 is a rear perspective view of the stroller frame of Fig. 3, with the infant carrying seat and umbrella elements installed;

[0039] Fig. 12 is a front perspective view of yet another stroller made in accordance with this disclosure;

[0040] Fig. 13 is a front plan view of the stroller shown in Fig. 12;

[0041] Fig. 14 is a right side view of the stroller shown in Fig. 12;

[0042] Fig. 15 is a rear plan view of the stroller shown in Fig. 12;

[0043] Fig. 16 is a top plan view of the stroller shown in Fig. 12; and

[0044] Fig. 17 is a bottom plan view of the stroller shown in Fig. 12.

[0045] It should be understood that the drawings are not necessarily to scale and that the disclosed embodiments are sometimes illustrated diagrammatically and in partial views. In certain instances, details which are not necessary for an understanding of the disclosed methods and apparatuses or which render other details difficult to perceive may have been omitted. It should be understood, of course, that this disclosure is not limited to the particular embodiments illustrated herein.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

[0046] Fig. 3 is a perspective view of a stroller 30 made in accordance with this disclosure. The stroller 30 has three frames, including side frames 31, 32 and a middle frame shown at 33. Each frame 31, 32, 33 includes a front leg 34, 35, 36 connected to a rear leg 37, 38, 39 at an apex 41, 42, 43 respectively. The front leg 36 of the middle frame 33 also serves as a place for attaching the steering handle assembly 44. Each front leg 34, 35, 36 includes a dual wheel assembly 45, 46, 47 respectively. Similarly, each rear of leg 37, 38, 39 is also connected to a rear dual wheel assembly 48, 49, 51 respectively.

[0047] The rear leg 39 and rear wheels 51 of the middle frame 33 are disposed forward of the corresponding rear legs 37, 38 and rear wheels 48, 49 of the side frames 31, 32 to provide an additional space or area for the user to step into. This arrangement makes it easier for the user to avoid stepping on the middle rear wheels 51. See also Fig. 6.

[0048] Turning to Fig. 4, two spreader bar mechanisms are used to connect each side frame 31, 32 to the middle frame 33. The two different spreader bar mechanisms, for a total of four spreader bar mechanisms, include two vertical spreader bar mechanisms 53, 54 and two

horizontal spreader bar mechanisms 55, 56. The spreader bar mechanisms 53, 54, 55, 56 provide stability to the stroller 30 when it is in the open position as shown in Figs. 3-8 and also provide a smooth and easy collapsing of the stroller 30 for storage and transport.

[0049] As shown in Figs. 4 and 6, the vertical spreader bar mechanisms 53, 54 include a central rod 57 disposed between and connected to three pairs of links shown at 58, 59, 61. The links 58, 59, 61 are connected to the central rod 57 by conventional pivotal connections, such as pins or rivets shown at 62, 63, 64 respectively.

[0050] Turning to Figs. 7-8, the horizontal spreader bar mechanisms 55, 56 include two pivotally connected cross bars 66, 67. The cross bars 66, 67 are pivotally connected at 68 by conventional means such as a pin or rivet.

[0051] While only two types of spreader bar mechanisms are shown here, it will be apparent to those skilled in the art that other types of the spreader bar mechanisms are available and can be substituted for the spreader bar mechanisms 53, 54, 55, 56 shown here.

[0052] Returning to Fig. 4, the upper distal end of the front leg 36 of the middle frame 33 is connected to the steering handle assembly 44. Preferably, the steering handle assembly 44 is pivotally connected to the leg 36. In the embodiment 30 illustrated in Figs. 3-8, the steering handle assembly 44 includes an ergonomically shaped oval or round handle 71 with padded grips 72 and at least one cup holder 73. An alternatively shaped handle 71a is shown in Figs. 12-18. Round steering handles can also be used. The handle 71 is preferably pivotally attached to the leg 36 as best seen in Fig. 5. Specifically, the cup holder housing 73 is connected to the upper distal end of the front leg 36 and provides a through hole connection for the handle 71 thereby providing a pivotal connection between the handle 71 and the front leg 36. A ratchet mechanism

may be installed in the housing 73 to provide for a secure positioning of the handle 71. Other types of locking mechanisms will be apparent to those skilled in the art. Further, the pivoting of the steering handles 71, 71a is not essential and fixed handles may be employed. The cup holder housing 73 is preferably a molded complement and, preferably, includes a pair of spaced apart cup receptacles shown at 74 although single cup holders are considered within the scope of this disclosure.

[0053] While the handle 71 includes an oval or semi-circular shape as shown in Figs. 3-8, the shape of the handle 71 can vary and it is anticipated that other ergonomic designs can be used. The padded grips 72 add to the ergonomic benefits of the shaped handle 71.

[0054] Also shown in Figs. 3-8 are the various spring elements used to support the infant seat, umbrella in storage compartment. Specifically, the spring elements shown at 80, 81 shown in Figs. 3-6 support the umbrella canopies 82, the spreader bar mechanisms 83 in combination with the curved forwardly extending rods 84 as shown in Figs.3-8 support the infant carriers 85 and the lower horizontal spreader bar mechanisms 55, 56 support the lower cargo compartments 86. The umbrella component 82, the infant carrier component 85, and the lower cargo component 86 are best seen in Figs. 9-11. These components may be fabricated from canvas, Nylon™ or other materials, both synthetic and natural.

[0055] An additional embodiment 30a is illustrated in Figs. 12-17 with most of the modifications being stylistic. Preferably, the middle rear wheels 51a are smaller and disposed forward of the side rear wheels to help the user avoid stepping on the middle rear wheels 51a. The handle 71amay beshaped differently as is the housing 73a of the steering handle assembly 44a. The design of the canopies 82a and the infant carriers 85a has also been modified.

[0056] While only certain embodiments have been set forth, alternatives and modifications will be apparent from the above description to those skilled in the art. These and other alternatives are considered equivalents and within the spirit and scope of this disclosure and the appended claims.

WHAT IS CLAIMED:

1. A side-by-side tandem stroller comprising:

two side frames with a middle frame disposed therebetween,

each side frame being connected to the middle frame by horizontal spreader bar mechanism and a vertical spreader bar mechanism,

the middle frame being connected to a steering handle.

2. The stroller of claim 1 wherein each side frame and the middle frame comprise a front leg connected at an apex to a rear leg,

each horizontal spreader bar mechanism connecting the front and rear legs of one of the side frames to the front and rear legs of the middle frame,

each vertical spreader bar mechanism connecting the rear leg of one of the side members to the rear leg of the middle frame.

3. The stroller of claim 2 wherein the front leg of the middle frame extends upward beyond the apex of the middle frame and terminates at a upper distal end which is connected to the steering handle.

4. The stroller of claim 3 wherein each rear leg is connected to at least one wheel, the at least one wheel connected to the rear leg of the middle frame being smaller in diameter than the at least one wheel connected to each side frame

5. The stroller of claim 4 wherein the steering handle is a closed loop connected to the middle frame and extends laterally to the right and to the left from the middle frame before extending rearward towards the user.

6. The stroller of claim 5 wherein the steering handle is pivotally connected to the middle frame.

7. The stroller of claim 5 wherein the steering handle is pivotally connected to front leg of the middle frame.

8. The stroller of claim 1 wherein the middle frame comprises a front leg connected to a rear leg at an apex, the front leg of the middle frame extending upward beyond the apex of the middle frame and terminates at an upper distal end which is connected to the steering handle.

9. The stroller of claim 1 wherein the middle frame is connected to a pair of middle rear wheels and each side frame is connected to a pair of rear side wheels, the rear middle wheels being smaller than the rear side wheels.

10. The steering handle of claim 9 wherein the rear middle wheels are disposed forward of the rear side wheels.

11. The stroller of claim 1 wherein each side frame and the middle frame comprise a front leg rigidly connected to a rear leg at an apex,

each horizontal spreader bar mechanism collapsibly connecting the front and rear legs of one of the side frames to the front and rear legs of the middle frame,

each vertical spreader bar mechanism collapsibly connecting the rear leg of one of the side members to the rear leg of the middle frame, the rear legs of the side frames being connected to side rear wheels.

The rear leg of at least one middle rear wheel.

The middle rear wheel being smaller than the side rear wheels.

12. The stroller of claim 12 wherein the middle rear wheel is disposed forward of the side rear wheels.

13. The stroller of claim 1 wherein the steering handle further comprises at least one cup holder.

14. A side-by-side tandem stroller comprising:

two side frames with a middle frame disposed there between,

each side frame being connected to the middle frame by horizontal spreader bar mechanism and a vertical spreader bar mechanism,

each side frame and the middle frame comprise a front leg connected at an apex to a rear leg,

each horizontal spreader bar mechanism connecting the front and rear legs of one of the side frames to the front and rear legs of the middle frame,

each vertical spreader bar mechanism connecting the rear leg of one of the side members to the rear leg of the middle frame,

the front leg of the middle frame being extending beyond the apex of the middle frame and terminating at an upper distal end that is pivotally connected to a steering handle.

15. The stroller of claim 14 wherein the steering handle further comprises at least one cup holder.

16. The stroller of claim 14 wherein the steering handle further comprises a pair of cup holders.

17. The stroller of claim 14 wherein the steering handle forms a closed loop that is connected to the middle frame.

18. The stroller of claim 17 wherein the steering handle is oval-shaped.

19. The stroller of claim 17 wherein the steering handle is round.

20. The stroller of claim 14 wherein the steering handle forms a closed loop that is connected to the middle frame and that extends laterally to the right and to the left from the middle frame.

21. A side-by-side tandem stroller comprising:

two side frames with a middle frame disposed there between,

each side frame being collapsibly connected to the middle frame by horizontal spreader bar mechanism and a vertical spreader bar mechanism,

each side frame and the middle frame comprise a front leg fixedly connected at an apex to a rear leg,

each horizontal spreader bar mechanism collapsibly connecting the front and rear legs of one of the side frames to the front and rear legs of the middle frame,

each vertical spreader bar mechanism connecting the rear leg of one of the side members to the rear leg of the middle frame,

the front leg of the middle frame being extending beyond the apex of the middle frame and terminating at an upper distal end that is pivotally connected to a steering handle assembly,

the steering handle assembly comprising a generally horizontally disposed closed loop and at least one cup holder.

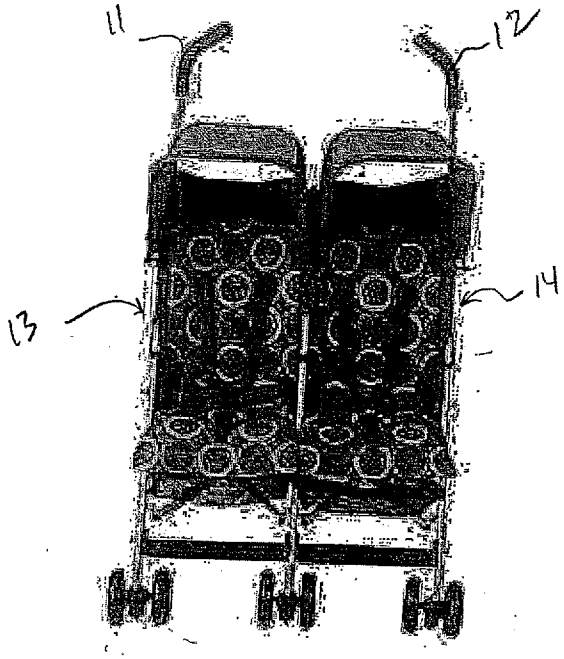

FIG 1
(PRIOR ART)

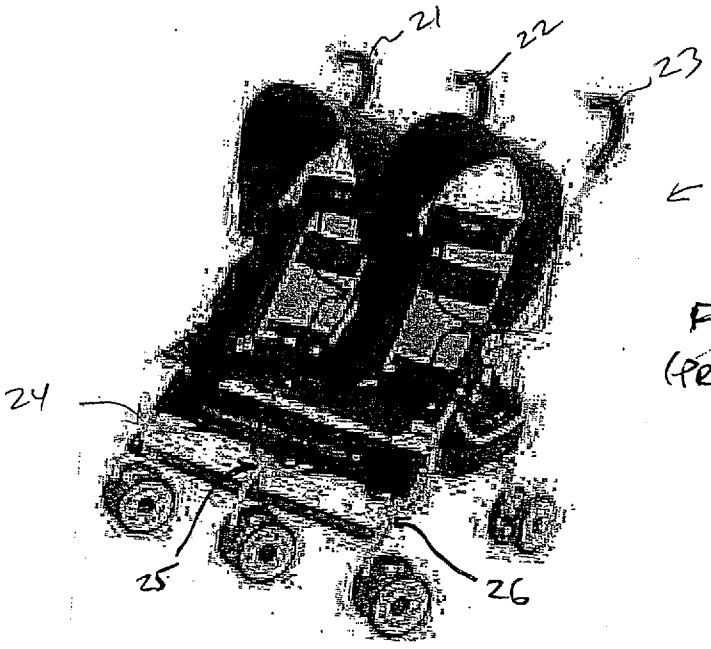

FIG 2
(PRIOR ART)

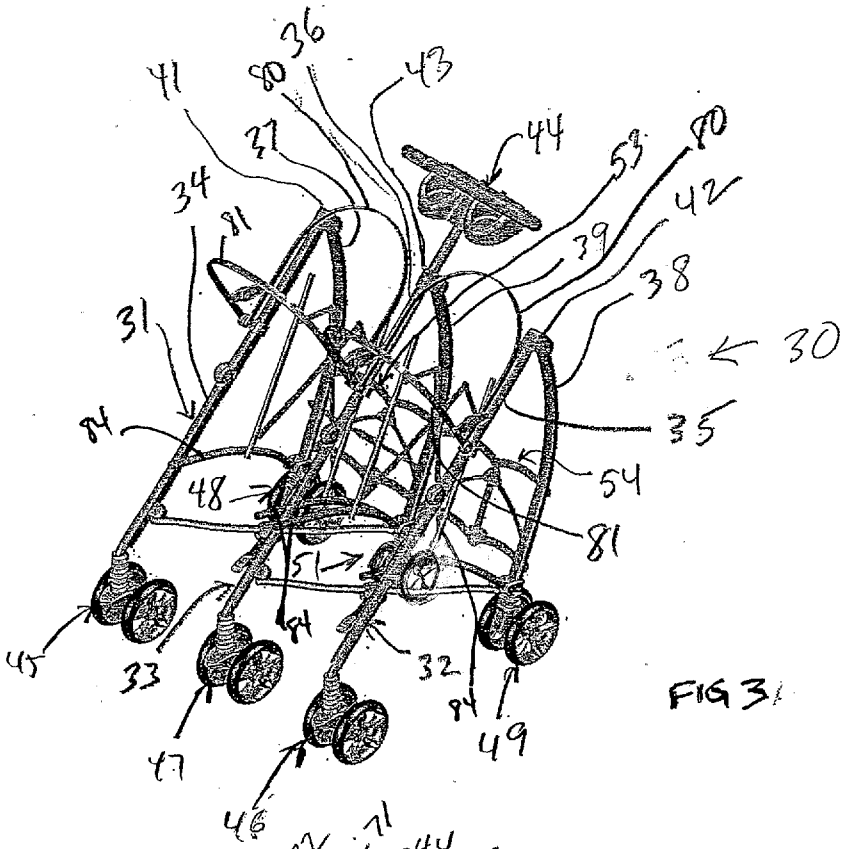
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FIG 3

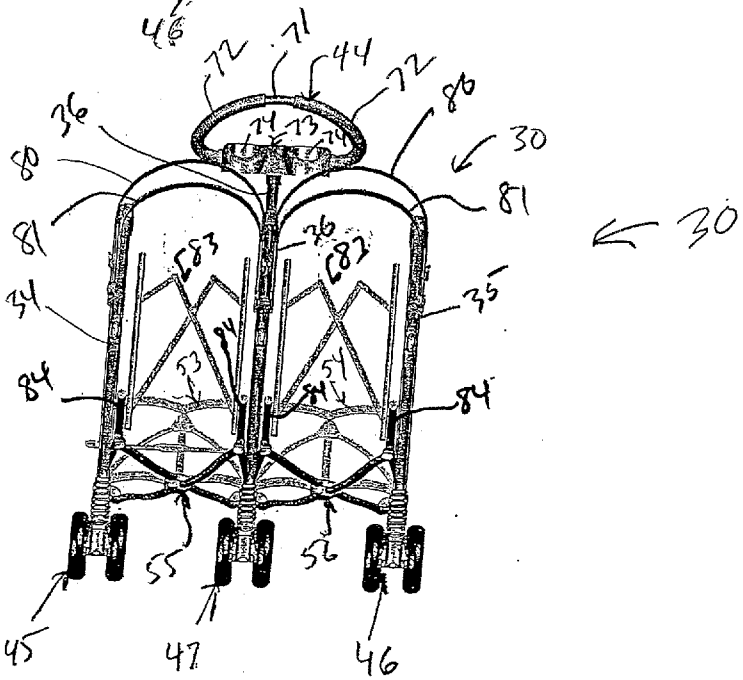
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FIG 4

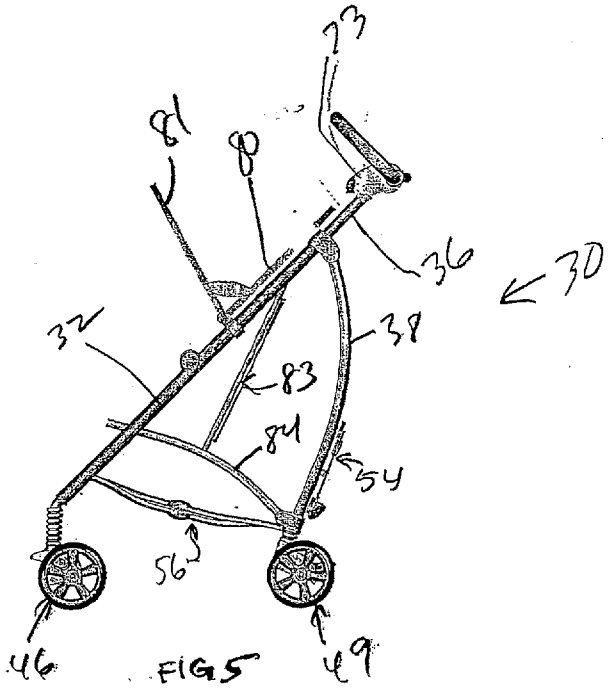
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FIG5

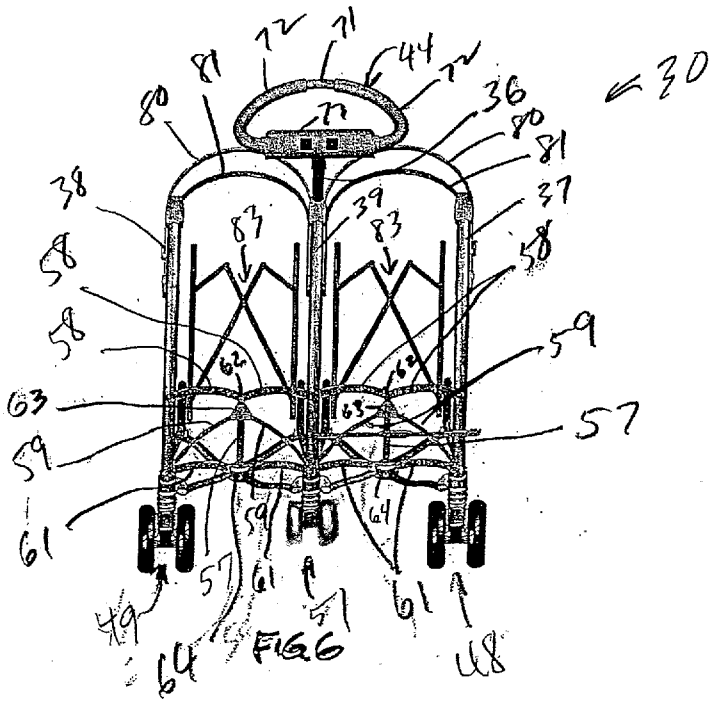
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FIG6

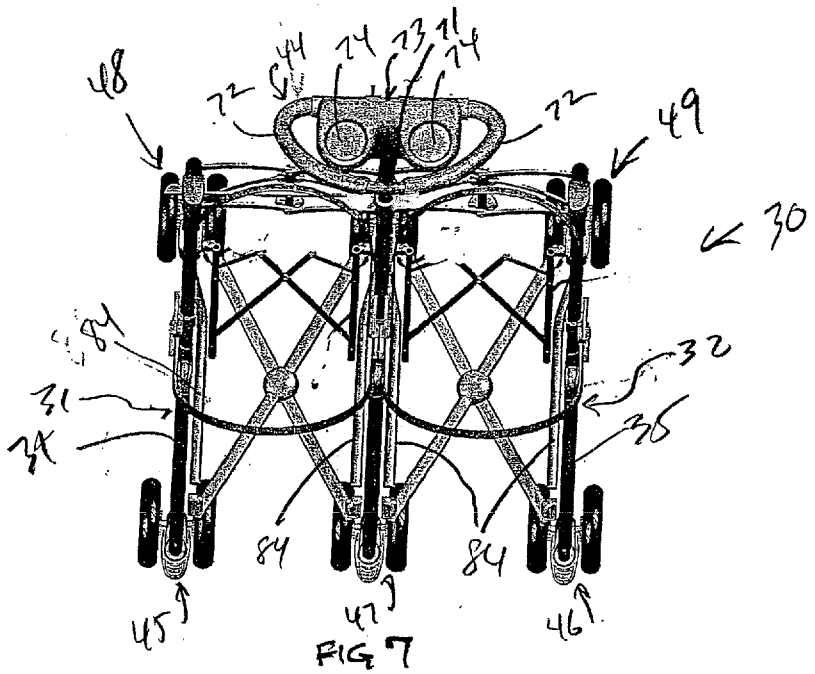
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FIG 7

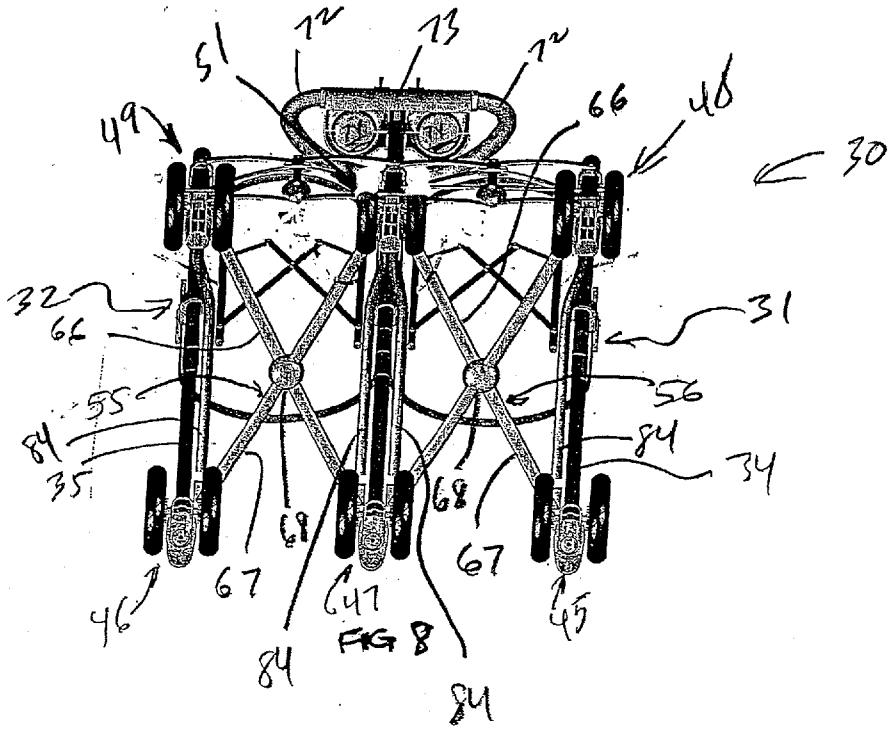
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FIG 8

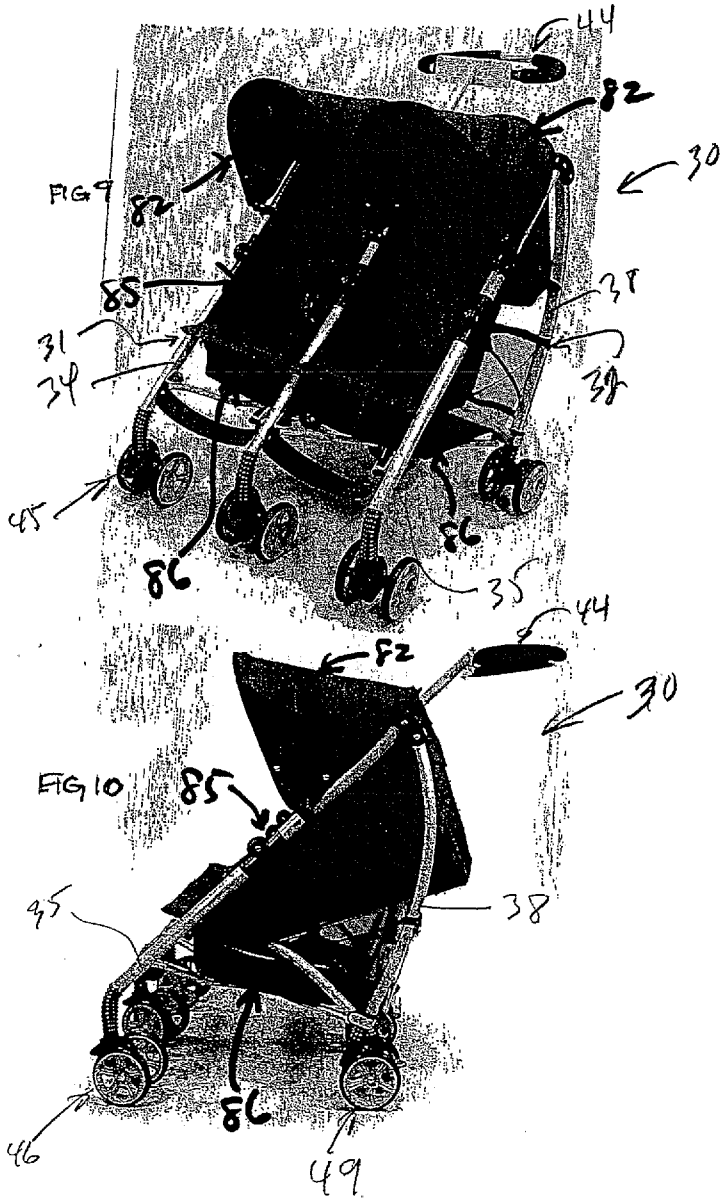
FIG 9
FIG 10
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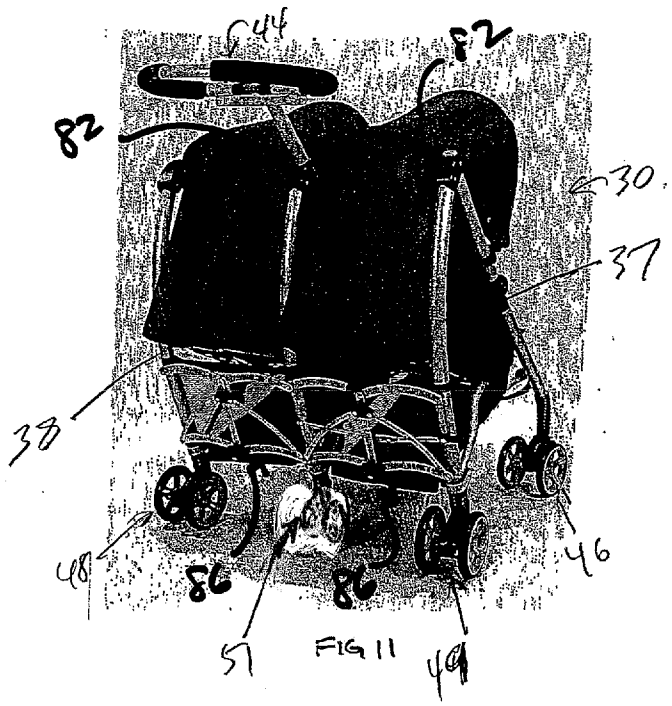
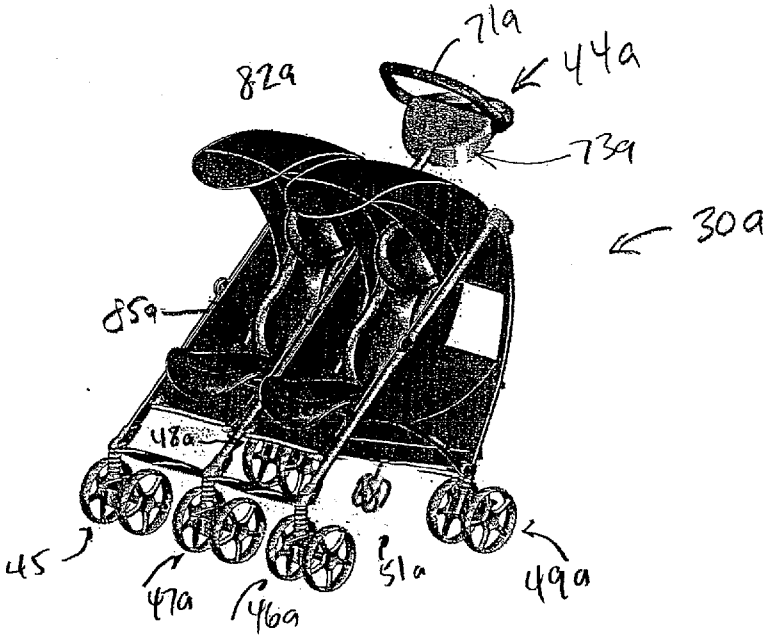


FIG 11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49a

FIG. 12

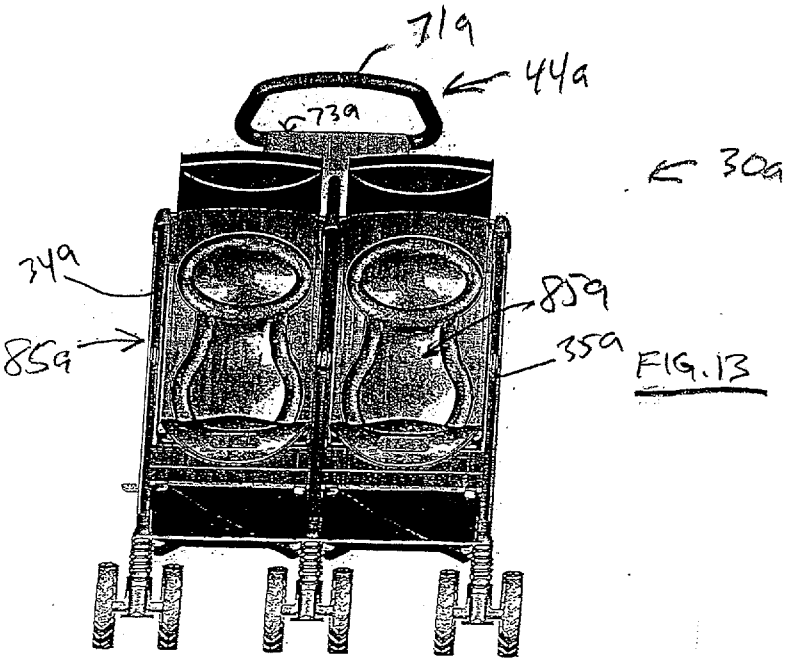
71a
44a
73a
30a
34a
85a
85a
35a

FIG. 13

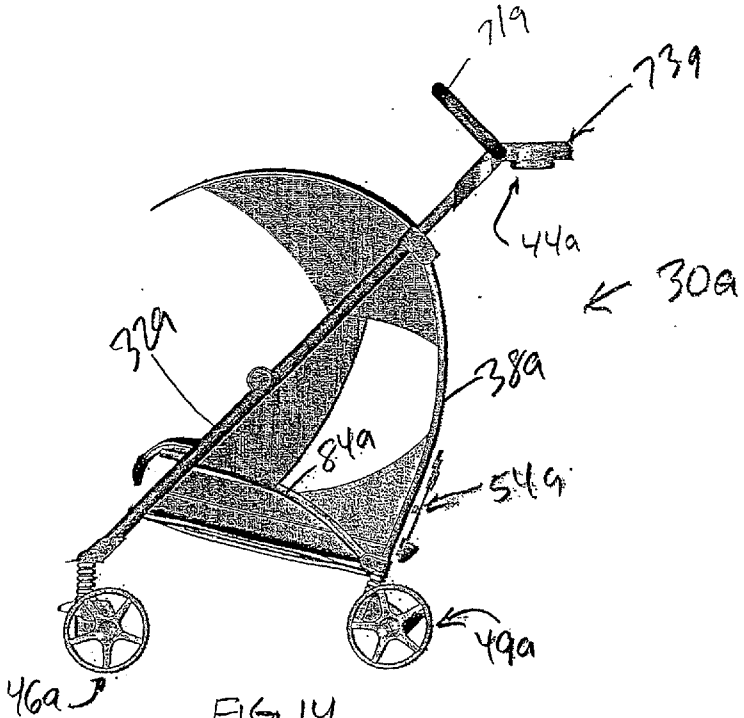
71a
73a
44a
30a
37a
38a
84a
54a
49a
46a

FIG. 14

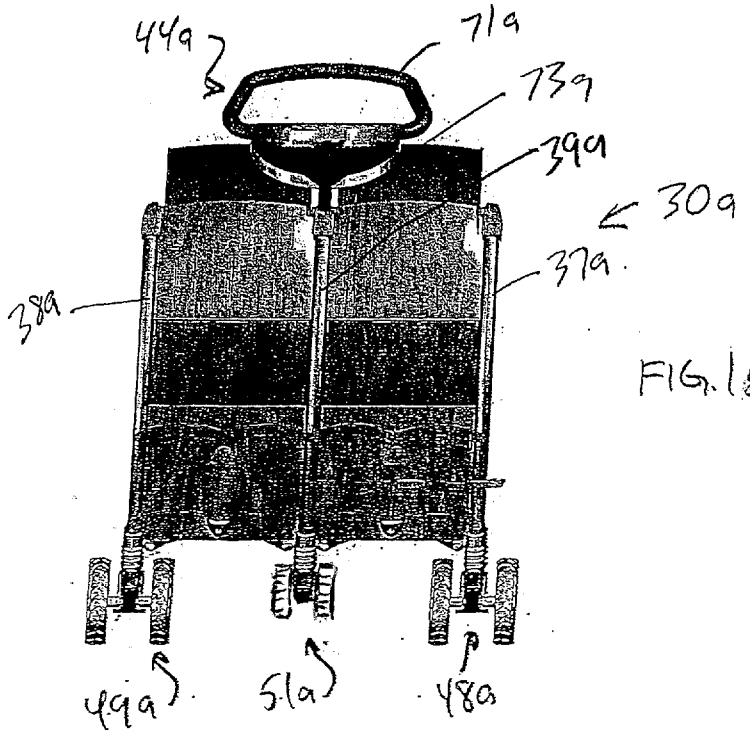
44a
71a
73a
39a
30a
37a
38a
49a
51a
48a

FIG. 15

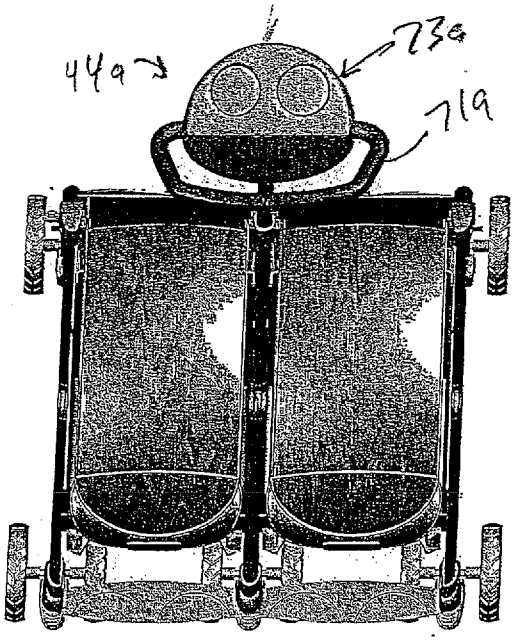

FIG. 16

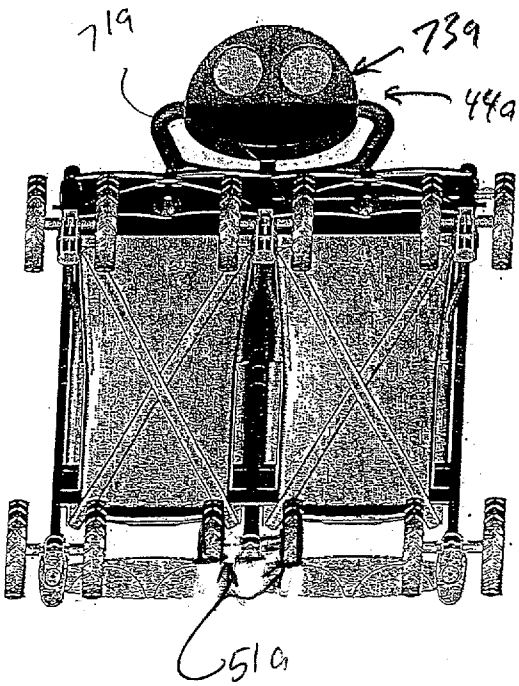

FIG 17