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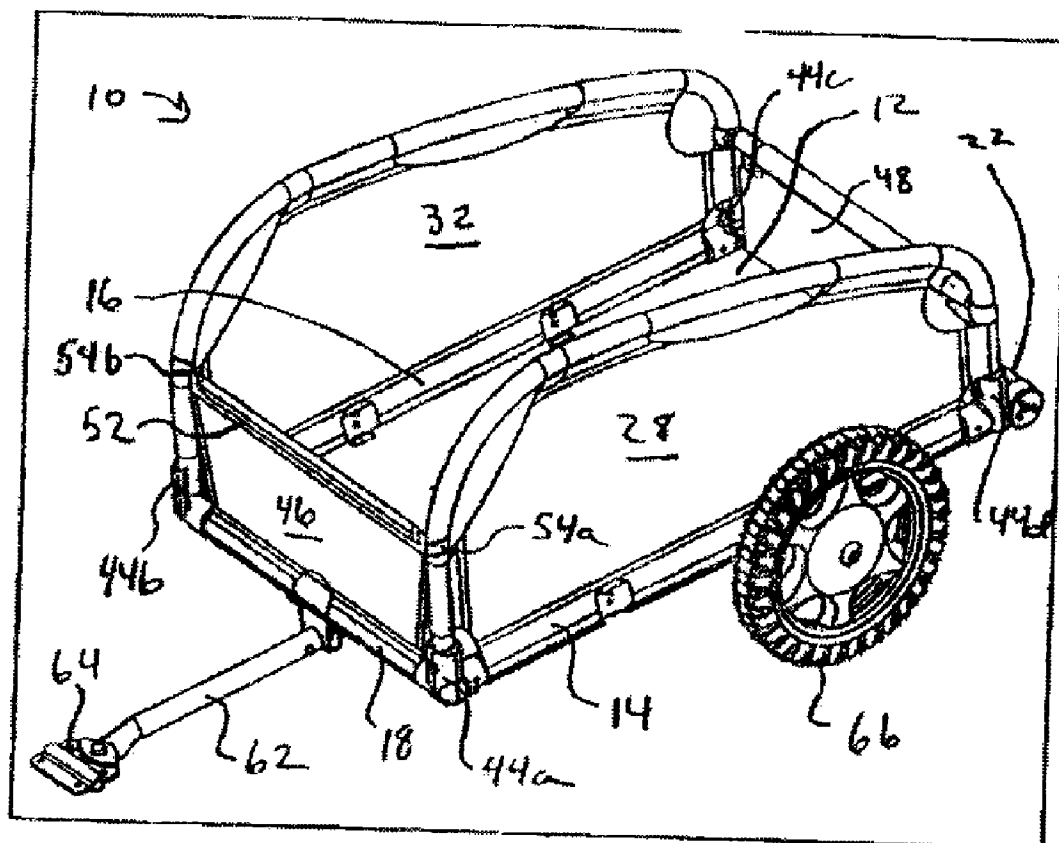
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(57) Abrégé/Abstract:

A folding trailer features a base having a top and a bottom and first and second side rails connected to the base. Front and rear end rails are also connected to the base. First and second sidewalls are pivotally connected to the first and second side rails so as

(57) **Abrégé(suite)/Abstract(continued):**

to pivot between upright and folded positions. Front and rear walls are connected to the front and rear end rails and feature tops which are removably attached to the side walls when they are in the upright position. At least one wheel is rotatably connected to the bottom of the base. A tow bar is pivotally connected to the bottom of the base and pivots between a storage position and a towing position.

ABSTRACT

A folding trailer features a base having a top and a bottom and first and second side rails connected to the base. Front and rear end rails are also connected to the base. First and second sidewalls are pivotally connected to the first and second side rails so as to pivot between upright and folded positions. Front and rear walls are connected to the front and rear end rails and feature tops which are removably attached to the side walls when they are in the upright position. At least one wheel is rotatably connected to the bottom of the base. A tow bar is pivotally connected to the bottom of the base and pivots between a storage position and a towing position.

FOLDING TRAILER

BACKGROUND

[0001] The invention relates generally to trailers for use with wagons, bicycles, tricycles and the like and, more particularly, to such a trailer that folds.

[0002] People often walk or ride a bicycle to places when they do not want to drive. When going such places, or when walking from a parking lot to an event location, people can use wagons or trailers to transport cargo such as children, coolers, picnic baskets, blankets, food, drinks, folding chairs, towels and toys.

BRIEF SUMMARY

[0003] The present invention relates to trailers that can be connected to wagons, bicycles, tricycles, or other wheeled vehicles used for transporting people. Trailers of the present invention preferably have side walls that fold down into a more compact position for storage.

[0004] In one aspect, a folding trailer is provided that includes a base having a top and a bottom, first and second side rails connected to the base, front and rear end rails connected to the base; at least one wheel rotatably connected to the bottom of the base, and a tow bar connected to the bottom of the base, the tow bar being adapted to connect the folding trailer to a vehicle that tows the folding trailer. The folding trailer also includes a first sidewall pivotally connected to the first rail and a second sidewall pivotally connected to the second side rail, each of which has an upright position and a folded position. In at least one embodiment, the base can have a top, a bottom, a first side, a second side, a front end, and a rear end. In such an embodiment, the first side rail can be connected to the first side of the base, and the second side rail can be connected to the second side of the base. The front end rail can be connected to the front end of the base, the first side rail, and the second side rail. Similarly, the rear end rail can be connected to the rear end of the base, the first side rail, and the second side rail.

[0005] In another aspect, a folding trailer is provided that includes a base having a top and a bottom, at least one wheel rotatably connected to the bottom of the base, and a tow bar pivotally connected to the bottom of the base, the tow bar having a storage position and a towing position. The folding trailer also includes first and second sidewalls pivotally connected to the base, each sidewall having an upright position and a folded position. A first clip can be connected to the bottom of the base that retains the tow bar when the tow bar is in the storage position. A second clip can be connected to the bottom of the base that retains the tow bar

1 when the tow bar is in the towing position. The folding trailer can also have a locking
2 mechanism that releasably locks the tow bar in the towing position.

3 BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

5 **[0006]** Specific embodiments of the invention have been chosen for purposes of illustration and
6 description, and are shown in the accompanying drawings, forming a part of the specification.

7 **[0007]** Figure 1A is a top front perspective view of one embodiment a folding trailer of the
8 preset invention, where all of the walls are in an upright position.

9 **[0008]** Figure 1B is a top front perspective view of the embodiment of Figure 1A, where the
10 front wall is in a folded or storage position.

11 **[0009]** Figure 1C is a top front perspective view of the embodiment of Figures 1A-1B, where the
12 front wall and the rear wall are in a folded or storage position.

13 **[0010]** Figure 1D is a top front perspective view of the embodiment of Figures 1A-1C, where all
14 of the walls are in a folded or storage position.

15 **[0011]** Figure 2A is a detail perspective view of one embodiment of a rear wall connected to a
16 side wall by a rear wall clip on one embodiment of a folding trailer of the present invention.

17 **[0012]** Figure 2B is a perspective view of the rear wall clip of Figure 2A.

18 **[0013]** Figure 2C is a transparent view of the rear wall clip of Figure 2B.

19 **[0014]** Figure 3A is a bottom front perspective view of the folding trailer of Figs. 1A-1D,
20 illustrating the tow bar in the towing position.

21 **[0015]** Figure 3B is a bottom front perspective view of the folding trailer of Figs. 1A-1D and 3A,
22 illustrating the tow bar in the storage position.

23 **[0016]** Figure 4A is a detail perspective view of one embodiment of a tow bar and clip having a
24 locking mechanism for use on a folding trailer of the present invention.

25 **[0017]** Figure 4B is a cross-sectional view of the embodiment of Figure 4A along line B.

26 **[0018]** Figure 4C is a cross-sectional view of the embodiment of Figure 4A along line C.

28 DETAILED DESCRIPTION

29 **[0019]** One embodiment of a folding trailer of the present invention is illustrated in general at 10
30 in Figs. 1A-1D and 3A-3B. It should be understood that while the preferred embodiment is
31 described herein in terms of a trailer for a children's wagon, folding trailers of the present
32 invention can be utilized with bicycles, tricycles or other riding vehicles.

33 **[0020]** As illustrated in Figs. 1A-1D, the folding trailer 10 has a base 12. Base 12 has a top, a
34 bottom, a first side, a second side opposite the first side, a front end, and a rear end opposite

1 the front end. Base 12 includes a floor that can be made of any suitable flexible, semi-rigid, or
2 rigid material. Preferably, the floor is formed from a sheet of rigid material, such as particle
3 board, wood, plastic, or any other rigid material that is lightweight. The base can also include
4 sockets 44a-d, and supports under the bottom of the floor, such as, for example, corner
5 supports 102a-d and support rails 104 and 106.

6 **[0021]** The folding trailer 10 has at least one wheel for supporting the trailer in a rolling fashion.
7 As illustrated in Figures 1A-1D and 3A-3B, the folding trailer 10 has two wheels 66 and 68.
8 Alternatively, folding trailers can also have three, four, or more wheels.

9 **[0022]** As illustrated, the folding trailer 10 has first side rail 14 connected to the first side of the
10 base 12, a second side rail 16 connected to the second side of the base 12, a front rail 18
11 connected to the front end of the base 12, and a rear rail 22 connected to the rear end of base
12 12. Preferably, the front and rear end rails each extend from the first side rail to the second side
13 rail, and are each connected to both the first side rail and the second side rail. As shown in
14 Figures 1A-1D and 3A-3B, sockets 44a-d are located at the corners of the base 12 of the folding
15 trailer 10. Each socket receives one end of one side rail and one end of one end rail, thus
16 connecting the two side rails 14 and 16 to the front end rail 18 and the rear end rail. The ends
17 of the rails can be secured in the sockets with fasteners. Each of the side rails and end rails
18 can also be connected to the floor by fasteners. In the illustrated embodiment, the side rails and
19 the end rails are each formed from hollow tubing. The hollow tubing can be any suitable
20 material, including but not limited to aluminum and plastic.

21 **[0023]** Folding trailer 10 has a first sidewall 28 that is pivotally connected to the first side rail 14,
22 and a second sidewall 32 that is pivotally connected to the second side rail 16. The first and
23 second sidewalls have an upright position, shown in Figures 1A-1C, and a folded position,
24 shown in Figure 1D. As illustrated, each sidewall has a frame member and a wall panel
25 connected to the frame member. The frame members 24 and 26 are preferably generally D-
26 shaped, generally C-shaped, or have another curvilinear shape. The frame members can have
27 any cross-sectional shape, but preferably have a cross-section that is substantially circular or
28 substantially square. The frame members 24 and 26 are preferably made of hollow tubing, like
29 the side and end rails of the folding trailer 10. The hollow tubing can be any suitable material,
30 such as aluminum or plastic.

31 **[0024]** The wall panels illustrated in Figures 1A-1D and 3A-3B are connected to a side rail at
32 the bottom, and to a sidewall frame member at the top. The wall panels can be fabric, and can
33 be connected to the sidewall frame members by loop portions 34, 36, 38 and 40, as illustrated in
34 Fig. 1B. While the frame member and fabric construction of the illustrated sidewalls is preferred

1 due to its lightweight, alternative materials and construction techniques may be used. For
2 example, each sidewall can be formed from a single piece of material or from multiple pieces.
3 In one alternative embodiment, single piece rigid panels that are hinged at the bottom, where
4 they connect to the base 12, could be substituted for the sidewall members and fabric sidewalls.

5 **[0025]** As illustrated Figs. 1A-1D, the sidewalls 24 and 26 are mounted in a hinged fashion to
6 an upper portion of sockets 44a-44d. The sockets 44a-44d are preferably constructed of
7 plastic. The upper portion of the sockets preferably have a cross-section that receives the
8 sidewall frame members. For example, when the sidewall frame members have a substantially
9 circular cross-section, the upper portion of the sockets is preferably C-shaped or semi-circular.
10 Similarly, when the sidewall frame members have a substantially square cross-section, the
11 upper portion of the sockets is preferably D-shaped or squared. The upper portion of the
12 sockets is preferably designed to receive the sidewall frame member and form a friction fit
13 therewith, so that the sidewalls are held in place when they are in the upright, vertical unfolded,
14 position illustrated in Figs. 1A-1C. The frame members of each sidewall member 24 and 26
15 preferably snap out of the upper portion of the sockets when the sidewalls are placed in the
16 folded position illustrated in Fig. 1D.

17 **[0026]** The folding trailer 10 has a front wall 46 and a rear wall 48. The front wall 46 has a
18 bottom that is connected to the front end rail 18, and the rear wall 48 has a bottom that is
19 connected to rear end rail 22. In the illustrated embodiment, the front and rear walls are
20 preferably constructed of fabric, or another flexible material, and do not have frame members
21 like those of the sidewalls. Instead, the top of the front wall 46 and the top of the rear wall 48
22 each removably connect to the first side rail and the second side rail when the side rails are in
23 the upright position. The tops of the front and rear walls can be connected to the first and
24 second sidewalls in any suitable manner, including but not limited to ties, hooks, hook and loop
25 fasteners such as Velcro®, snaps, clips, or buttons. When the tops of the front and rear walls
26 are disconnected from the sidewalls, the front and rear walls preferably collapse or fold
27 downwards, and can lie flat on the base 12 of the folding trailer 10. In alternative embodiments,
28 the front and rear walls can have frame members, or can be made from a rigid or semi-rigid
29 material, and can be pivotally connected to the front and rear end rails, respectively.

30 **[0027]** In the illustrated embodiment, front wall 46 has a rod, preferably made of metal, that is
31 sewn into its top edge, indicated at 52 of Figs. 1A and 1B. A pair of straps, indicated at 54a and
32 54b in Fig. 1A, having the male and female sides of snaps attached thereto can be looped
33 around the frame member of each sidewall and snapped to secure the front wall 46 to the
34 sidewalls 24 and 26 when the front wall is in the upright or unfolded configuration illustrated in

Fig. 1A. The rear wall 48 has a rod or tube 55, preferably made of metal, that is sewn into the top edge 56, as shown in Fig. 1B. Each end of the rod or tube 55 of the rear wall 48 can have a clip that attaches to one of the sidewalls 24 and 26 when the rear wall 48 is in the upright or unfolded configuration illustrated in Fig. 1A.

[0028] One type of clip that can be utilized to secure a rear wall 48, or front wall 46, to the sidewalls 28 and 32 is illustrated in Figures 2A-2C. When the sidewall frame members have a circular cross-section, the clip 72 preferably includes a generally C-shaped or semi-circular portion 74 that is sized to receive a sidewall member, as illustrated in Fig. 2A (and Fig. 1A). The generally C-shaped or semi-circular portion 74 can be sized to receive a sidewall member with a friction fit. Additionally, or alternatively, a spring-loaded pin 76 that is actuated by a handle 78 can protrude out of the end of rod or tube 55. As illustrated in Fig. 2C, a compression spring 80 can be positioned behind the handle 78 so that the pin 76 is urged out of the end of rod 55 and into the interior of the C-shaped portion 74. A corresponding opening (not shown) can be formed in the sidewall frame member 26, and can be engaged by the pin 76 when the sidewall 32 and the rear wall 48 are in the upright or unfolded configuration illustrated in Figs. 2A and 1A.

[0029] When it is desired to store the folding trailer 10 or transport it, such as in an automobile, the steps illustrated in Figs. 1B through 1D can be performed to change the folding trailer 10 from its upright position to its folded or storage position. More specifically, as illustrated in Fig. 1B, first the front wall 46 can be disconnected from the sidewalls and can be lowered into a folded or collapsed position on the base 12. As illustrated in Fig. 1C, the rear wall 48 can be disconnected from the sidewall frame members 24 and 26 and lowered into a folded or collapsed position on the base 12. As illustrated in Fig. 1D, the sidewall frame members 24 and 26 can be disconnected from the sockets 44a-44d, and sidewalls 28 and 32 can be moved from their upright position to their folded position. The front and rear walls can be disconnected and lowered in any order, but both are preferably disconnected and lowered prior to the sidewalls being moved into their folded position.

[0030] The tow bar 62 of folding trailer 10 is best illustrated in Figures 3A-3B. The tow bar 62 is pivotally connected to the bottom or underside of the base 12, and has a towing position, shown in Figs. 1A-1C and 3A, and storage position, shown in Figs. 1D and 3B. The tow bar 62 is preferably made of metal, and can be a solid or hollow tube. Tow bar 62 is adapted to connect the folding trailer to a vehicle that tows the folding trailer. In the illustrated embodiment, the tow bar 62 has a connector 64 that connects to the rear axle of a wagon, such as the RADIO FLYER Model 18 steel wagon of Radio Flyer Inc. Alternative connectors that connect the tow bar to a bicycle or tricycle may be substituted for connector 64.

1 **[0031]** As illustrated in Figs. 3A and 3B, the proximal end of the tow bar 62 is connected to the
2 base 12 of the trailer by a pivot 82. Pivot 82 is preferably connected to support rail 104, but can
3 alternatively be connected to the underside of the floor. The tow bar 62 can be pivoted
4 between the positions shown in Figs. 3A and 3B, as indicated by arrows 84 and 86,
5 respectively. The folding trailer 10 can have a first clip 92 connected to the bottom of the base
6 12 that retains the tow bar when the tow bar is in the storage position. The first clip is preferably
7 connected to support rail 106. The folding trailer 10 can also have a second clip 88 connected
8 to the bottom of the base 12 that retains the tow bar when the tow bar is in the towing position.
9 In its towing position, the towing bar preferably protrudes out from underneath the base 12 of
10 folding trailer 10 to facilitate making a connection between the folding trailer 10 and the vehicle
11 that will be towing it. The storage position of the towing bar 62 is preferably approximately 180
12 degrees from the towing position. Additionally, the towing bar 62 is preferably tucked
13 underneath the base 12 of the folding trailer 10 in its storage position, so that towing bar 62
14 does not increase the storage volume needed for storing folding trailer 10.

15 **[0032]** The folding trailer 10 preferably has a locking mechanism that releasably locks the tow
16 bar 62 in the towing position. One type of locking mechanism is illustrated in Figure 4A, and in
17 the cross-sectional views thereof provided in Figs. 4B and 4C. In the illustrated embodiment,
18 the locking mechanism includes a V-shaped spring 98 within the tow bar 62. The V-shaped
19 spring 98 has a pair of inner pins 94a and 94b that protrude through the tow bar, and also has a
20 pair of outer pins 96a and 96b that protrude through the tow bar. Inner pins 94a and 94b are
21 received by a pair of bores in the second clip 88 that receive the pair of inner pins when the tow
22 bar is in the towing position. Outer pins 96a and 96b are preferably located closer to the point
23 of the V-shaped spring than inner pins 94a and 94b, and can be manually squeezed into the
24 towing bar 62 to release inner pins 94a and 94b from the bores in the second clip 88.

25 **[0033]** From the foregoing, it will be appreciated that although specific embodiments of the
26 invention have been described herein for purposes of illustration, various modifications may be
27 made without deviating from the spirit or scope of the invention. It is therefore intended that the
28 foregoing detailed description be regarded as illustrative rather than limiting, and that it be
29 understood that it is the following claims, including all equivalents, that are intended to
30 particularly point out and distinctly claim the subject matter regarded as the invention.

CLAIMS

What is claimed is:

1. A folding trailer comprising:
a base having a top and a bottom;
first and second side rails connected to the base;
front and rear end rails connected to the base;
a first sidewall pivotally connected to the first side rail, the first sidewall having an upright position and a folded position;
a second sidewall pivotally connected to the second side rail, the second sidewall having an upright position and a folded position;
at least one wheel rotatably connected to the bottom of the base; and
a tow bar connected to the bottom of the base, the tow bar being adapted to connect the folding trailer to a vehicle that tows the folding trailer.
2. The folding trailer of claim 1, wherein the base comprises a floor formed from a rigid or semi-rigid material.
3. The folding trailer of claim 1, wherein the base has a first side, a second side, a front end, and a rear end.
4. The folding trailer of claim 3, wherein the first side rail is connected to the first side of the base, and the second side rail is connected to the second side of the base.
5. The folding trailer of claim 4, wherein each end rail is connected to the first side rail, extends from the first side rail to the second side rail, and is connected to the second side rail.
6. The folding trailer of claim 1, wherein the side rails and the end rails are each formed from hollow tubing.
7. The folding trailer of claim 6, wherein the hollow tubing is aluminum, or plastic.
8. The folding trailer of claim 1, wherein each sidewall comprises a frame member and a wall panel connected to the frame member.
9. The folding trailer of claim 1, further comprising:
a front wall having a bottom and a top, the bottom of the front wall being connected to the front rail; and
a rear wall having a bottom and a top, the bottom of the rear wall being connected to the rear end rail.

10. The folding trailer of claim 9, wherein the top of the front wall removably connects to the first sidewall and the second sidewall when the sidewalls are in the upright position.

11. The folding trailer of claim 9, wherein the top of the rear wall removably connects to the first sidewall and the second sidewall when the sidewalls are in the upright position.

12. The folding trailer of claim 1, wherein the tow bar is pivotally connected to the base and has a storage position and a towing position.

13. The folding trailer of claim 12, further comprising a first clip connected to the bottom of the base that retains the tow bar when the tow bar is in the storage position.

14. The folding trailer of claim 12, further comprising a second clip connected to the bottom of the base that retains the tow bar when the tow bar is in the towing position.

15. The folding trailer of claim 14, further comprising a locking mechanism that releasably locks the tow bar in the towing position.

16. The folding trailer of claim 15, wherein the locking mechanism comprises:
a V-shaped spring within the tow bar, the V-shaped spring having a pair of inner pins that protrude through the tow bar and a pair of outer pins that protrude through the tow bar; and
a pair of bores in the second clip that receive the pair of inner pins when the tow bar is in the towing position.

17. A folding trailer comprising:
a base having a top, a bottom, a first side, a second side, a front end, and a rear end;
a first side rail connected to the first side of the base;
a second side rail connected to the second side of the base;
a front end rail connected to the front end of the base, the first side rail, and the second side rail;
a rear end rail connected to the rear end of the base, the first side rail, and the second side rail;
a first sidewall pivotally connected to the first rail, the first sidewall having an upright position and a folded position;
a second sidewall pivotally connected to the second side rail, the second sidewall having an upright position and a folded position;
at least one wheel rotatably connected to the bottom of the base; and
a tow bar connected to the bottom of the base, the tow bar being adapted to connect the folding trailer to a vehicle that tows the folding trailer.

18. The folding trailer of claim 17, further comprising:

a front wall having a bottom and a top, the bottom of the front wall being connected to the front end rail, and the top of the front wall removably connecting to the first sidewall and the second sidewall when the sidewalls are in the upright position; and

a rear wall having a bottom and a top, the bottom of the rear wall being connected to the rear end rail, and the top of the rear wall removably connecting to the first sidewall and the second sidewall when the sidewalls are in the upright position.

19. A folding trailer comprising:

a base having a top and a bottom;

first and second sidewalls pivotally connected to the base, each sidewall having an upright position and a folded position;

at least one wheel rotatably connected to the bottom of the base;

a tow bar pivotally connected to the bottom of the base, the tow bar having a storage position and a towing position;

a first clip connected to the bottom of the base that retains the tow bar when the tow bar is in the storage position; and

a second clip connected to the bottom of the base that retains the tow bar when the tow bar is in the towing position.

20. The folding trailer of claim 19, further comprising a locking mechanism that releasably locks the tow bar in the towing position, the locking mechanism including:

a V-shaped spring within the tow bar, the V-shaped spring having a pair of inner pins that protrude through the tow bar and a pair of outer pins that protrude through the tow bar; and

a pair of bores in the second clip that receive the pair of inner pins when the tow bar is in the towing position.

Fig. 1A

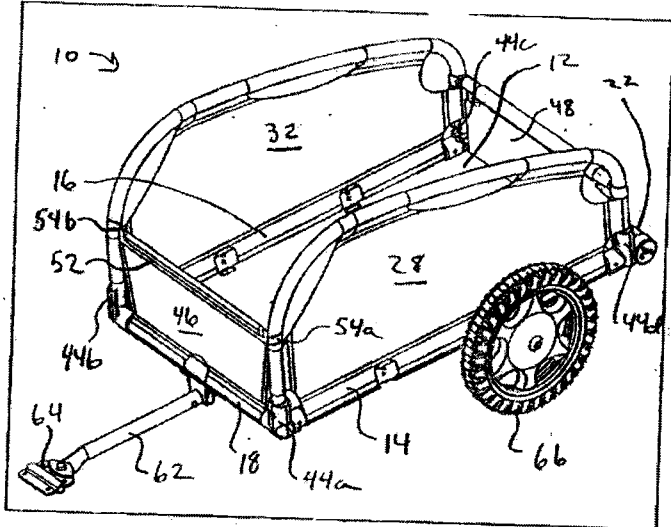


Fig. 1C

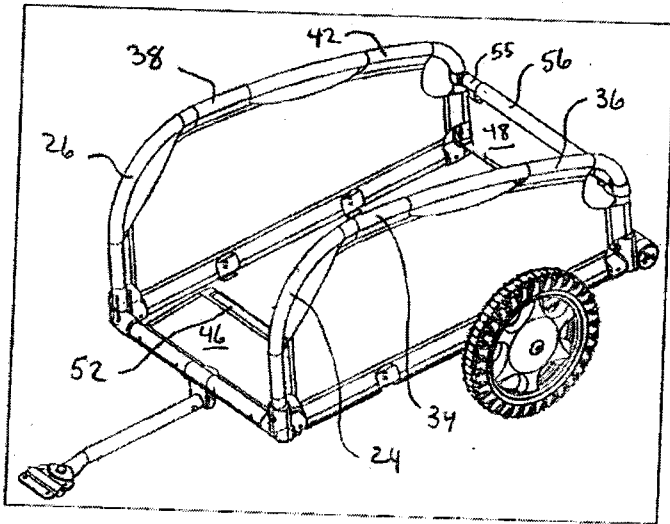
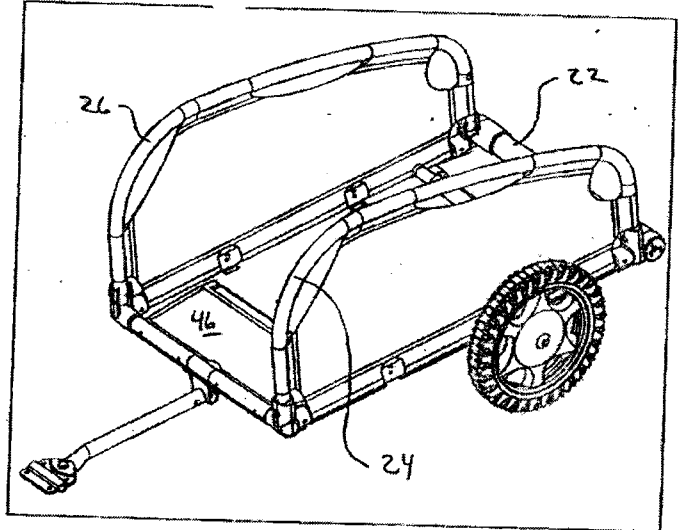


Fig. 1B

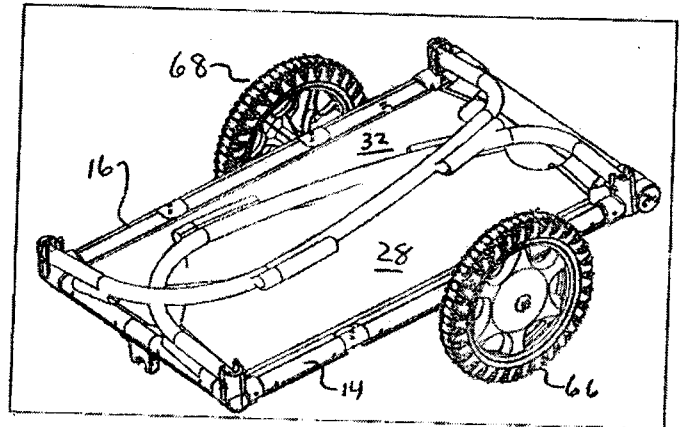
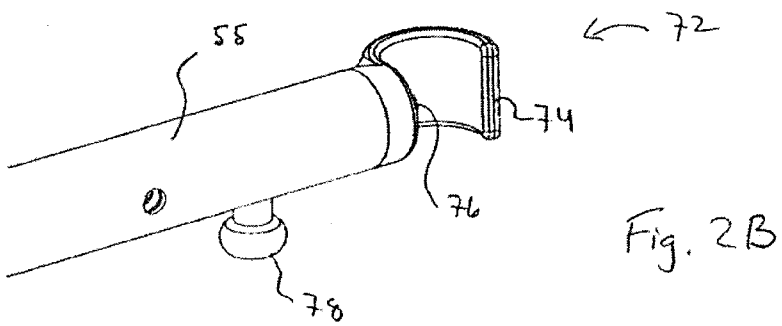
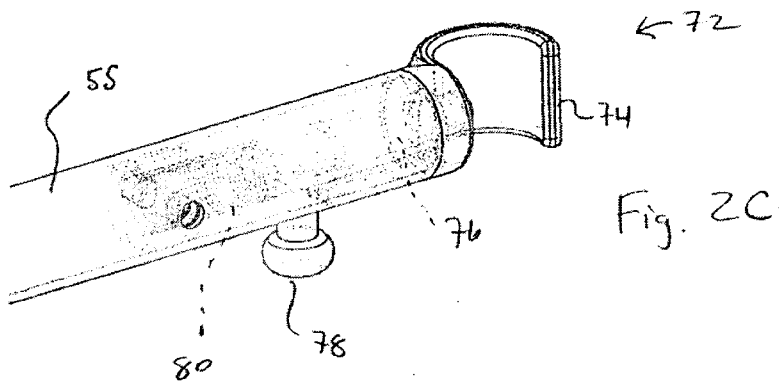
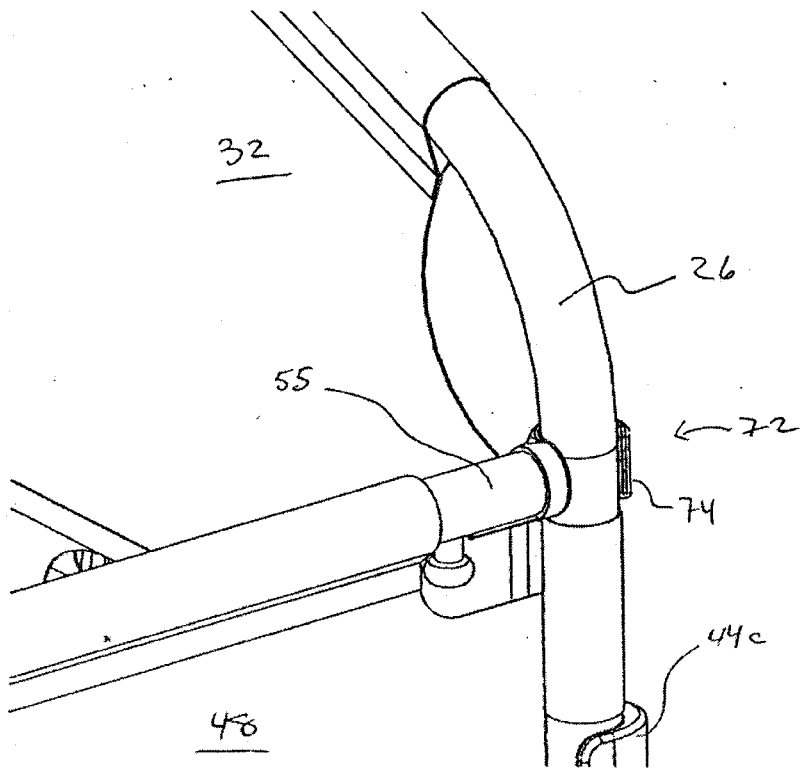


Fig. 1D



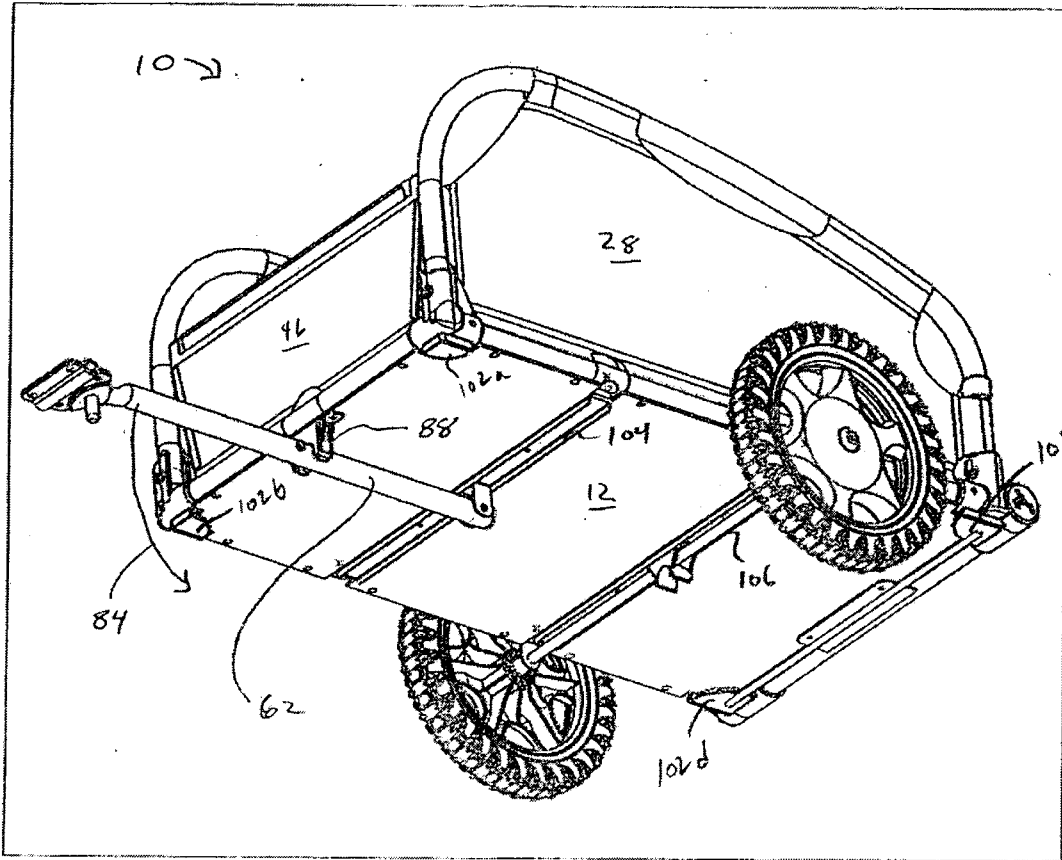


Fig. 3A

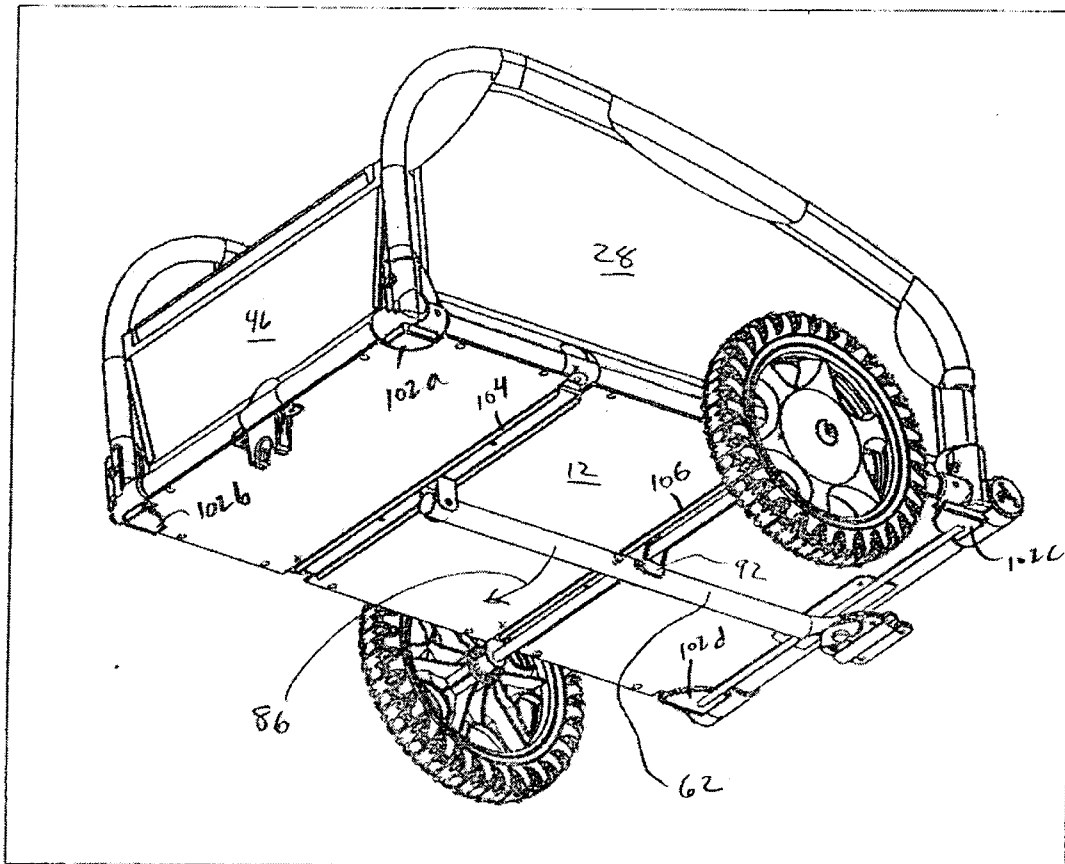


Fig. 3B

Fig. 4A

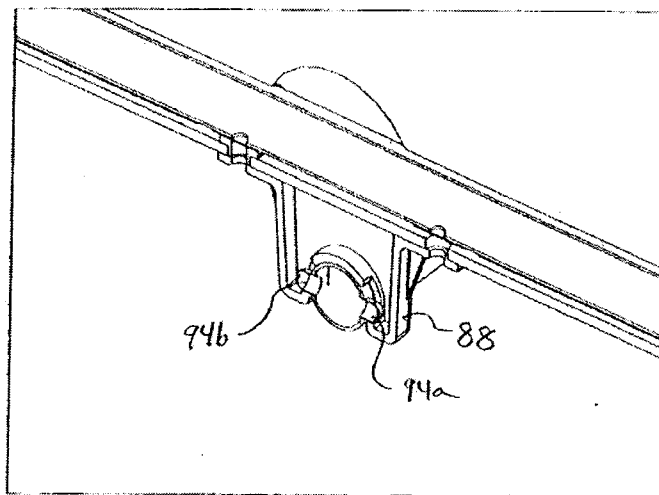
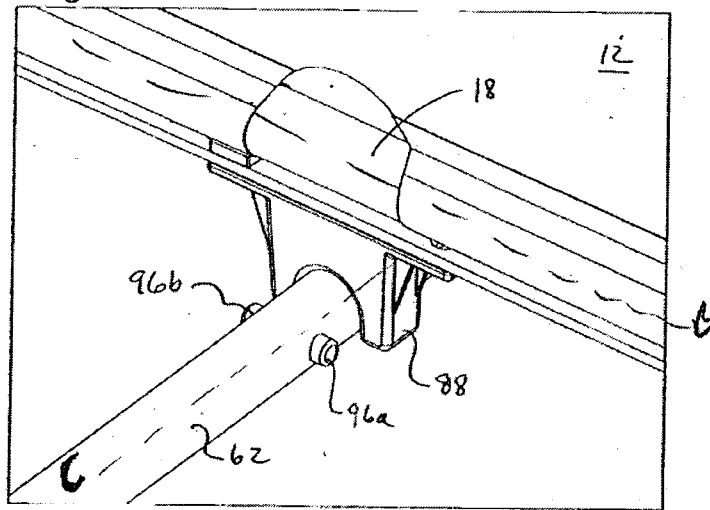


Fig. 4B

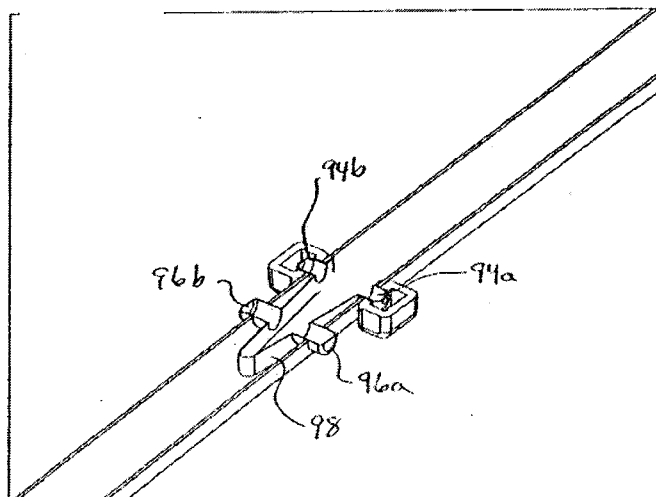


Fig. 4C

