Nov. 8, 1960 L. L. BAUER 2,959,212

SEAT TUBE GUIDE FOR FOLDING WHEEL CHAIRS

Filed July 14, 1958

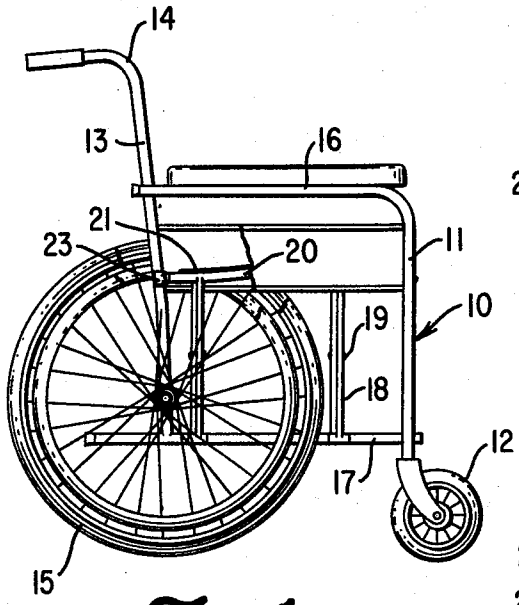


Fig. 1

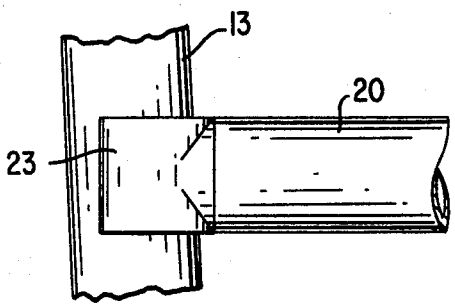


Fig. 2

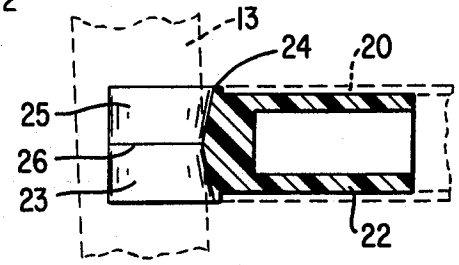


Fig. 4

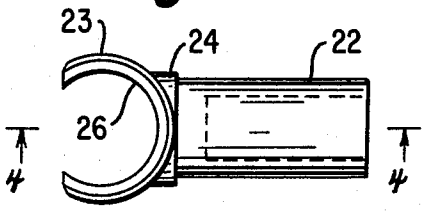


Fig. 3

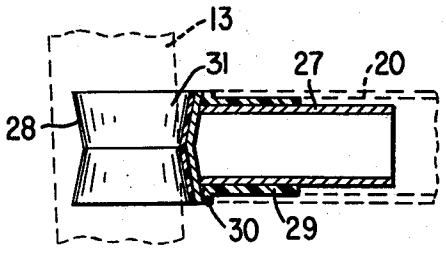


Fig. 7

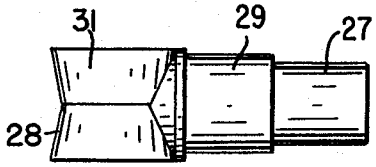


Fig. 5

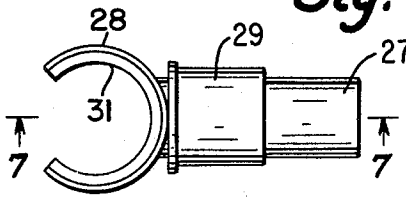


Fig. 6

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SEAT TUBE GUIDE FOR FOLDING WHEEL CHAIRS

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1 Claim. (Cl. 155—191)

This invention relates to folding invalid wheel chairs and an object is to facilitate the folding and unfolding operations with respect to such chairs by providing a simple and inexpensive expedient for imparting relatively free sliding movement between the seat rails and the vertically disposed pusher member when the side frames of the chair are moved relatively inwardly or outwardly either to fold the chair or unfold it to position of use.

Another object is to expedite the sliding movement above mentioned when the pusher rods are inclined from the vertical.

A further object resides in producing a folding chair structure having the advantageous features of construction, arrangement, operation and choice of materials hereinafter more specifically set forth.

For purposes of illustration but not of limitation, embodiments of the invention are shown in the accompanying drawings in which—

Figure 1 is a side elevation of a folding invalid wheel chair embodying the invention;

Figure 2 is an enlarged fragmentary side elevation showing the connection between a seat rail and the respective vertically disposed pusher member;

Figure 3 is an enlarged plan view of the guide member which is carried by a seat rail and which slidingly engages the upright pusher member;

Figure 4 is a longitudinal sectional view on the line 4—4 of Figure 3;

Figure 5 is a side elevation of an alternate form of guide member;

Figure 6 is a plan view of the guide member shown on Figure 5; and

Figure 7 is a longitudinal sectional view on the line 7—7 of Figure 6.

The illustrated embodiment of the invention comprises a folding invalid wheel chair which when not in use may be folded or compacted to occupy a relatively small amount of space to make it adaptable for storage or traveling purposes. When it is desired to be used, the chair can be readily unfolded by moving the side frames apart. In this instance, only one of the side frames is shown, it being understood that an identical side frame is on the opposite side. Wheel chairs of this type are well known in the art and reference is made by way of example to U.S. patent to Lane et al. 2,810,429 dated October 22, 1957.

Each of the side frames **10** includes a front vertically disposed rail **11** on the lower end of which is mounted a caster wheel **12**. At the rear of the frame is a vertically disposed pusher rail **13** which extends upwardly a substantial distance above the front rail **11** and is bent rearwardly to provide a handle part **14** to be grasped to move the chair from place to place. Mounted on the lower portion of the pusher rail **13** is a relatively large wheel **15** which may be provided with a hand rim to enable the occupant to self-propel the chair as will be readily understood. The upper end of the front rail **10** is bent rearwardly to provide a horizontally disposed upper rail **16** which may be suitably secured at its rear end to the

adjacent portion of the pusher rail **13**. Substantially parallel with the upper horizontal rail **16** is a lower horizontally disposed rail **17**, the front end of which is suitably secured to the front rail **11**, the rear end being secured to the pusher rail **13**. In this instance the various rails above described are of metal tubing.

Connecting the side frames are pairs of pivotally connected braces **18** which are pivoted at **19** intermediate their ends. A pair of such braces is disposed at the forward end of the lower rail **17** and another pair being disposed at the rear end portion of this rail. The lower end of each of the braces is connected to a lower rail **17** of one of the side frames. The upper ends of the braces **18** are respectively connected to horizontal seat rails **20** which are also of tubular form, there being one adjacent each of the side frames and these seat rails are connected by a flexible seat panel **21**. Also it will be understood that the upper portions of the pusher rails **13** are connected by a flexible back member. This is not shown on the accompanying drawing since it is well known to those skilled in this art and forms no part of the present invention.

In accordance with this invention, a guide device is provided for guiding the up and down movement of the rear end of each seat rail **20** along the respective vertically disposed pusher rail **13**. As shown in Figures 1 to 4, the guide device comprises a horizontally disposed post or shank portion **22** which fits inside of and is rotatable within the adjacent end of the respective seat rail **20**. At the outer end of the post **22** is an integral substantially C-shaped pusher rail engaging part **23** which partially embraces the respective pusher rail and is slidable up and down thereon. A shoulder **24** is provided at the juncture of the shank or post portion **22** and the C-shaped portion **23** to abut against the outer end of the seat rail and limit the inward movement thereof. In this instance the guide device is an integral structure and fabricated from a plastic material such nylon.

In order to minimize frictional contact and facilitate the sliding action, the inside of the C-shaped portion **23** is flared or tapered inwardly from the top and from the bottom as indicated at **25** to provide a centrally disposed relatively narrow bearing edge portion **26**. Thus this relatively sharp edge portion slides along the respective rail and, since it provides approximately a line contact, relatively little friction is created.

Attention is particularly directed to the fact that the pusher rails **13** are inclined rearwardly about 7° from the vertical. This feature alone makes difficult the up and down movement of the seat rail **20** under ordinary circumstances. However with the use of the guide device as above formed, such sliding movement in the folding and unfolding of the chair is rendered simple. The posts **22** are able readily to slide in and out and to turn as required, and the flared inside of the C-shaped rail-engaging parts automatically accommodate themselves to the inclination of the pusher rails and move thereover substantially free of friction or any binding action.

It will be manifest that when the side panels **10** are moved toward each other, the action of the pivoted braces **18** cause the seat rails **20** to move upwardly relative to the pusher rods **13** so that the guide devices move upwardly along the rails or tubes **13** and because of the line contact between the guide devices and the tubular rails and since the material is of nylon which is substantially anti-friction, this folding action can be achieved readily and simply and without great exertion. Similarly when the side frames **10** are moved apart which causes the seat rails **20** to move downwardly, this action, too, is facilitated due to the structure of the guide devices. Additionally the post portions **22** which are disposed within the end portions of the respective seat rails rotate and slide freely as is neces-

sary due to the relative movement of the parts. Here, too, the relative anti-friction action of the nylon with respect to the metal of the tube is such that the post can turn readily and without requiring lubrication.

In the alternate form shown in Figures 5 to 7, the post portion 27 of the guide device is of metal tubing and secured as by welding to the outer end is a C-shaped element 28 for embracing the respective pusher tube or rail 13. In this instance a portion of the post or shank 27 is covered by a nylon sleeve 29 and similarly the inside of the C-shaped part 28 is covered by a nylon sleeve portion 31 suitably adhered to the C-portion. The C-portion is similarly shaped to that above described so as to provide a substantially line contact between it and the pusher rail. A similar shoulder 30 is provided for engaging the outer end portion of the seat rail 20.

It will be understood that although nylon has been hereinbefore specified as being the material because of its anti-friction properties as well as its strength and ability to withstand the usage to which the part is subjected, other materials such for example as Teflon may be used to advantage and therefore the word "nylon" should cover any plastic or hard rubber or other materials which are non-metallic and which have the desired anti-friction properties.

Numerous changes in details of construction, arrangement, operation and choice of materials may be effected without departing from the spirit of the invention, especially as defined in the appended claim.

What I claim is:

In a folding wheel chair having a pair of laterally spaced upright end frames which can be moved toward each other in folded position or away from each other in position of use and having horizontal seat rails connected by a flexible seat panel, each end frame having a vertically disposed pusher rail along which the respective seat rail is guided during folding and unfolding movements, the improvement which comprises a guide device in the form of a post free to turn within the end portion of each seat rail and a C-shaped part integral with the post embracingly engaging the respective pusher rail for sliding movements thereon, said C-shaped part being tapered inwardly from the top and bottom to form a narrow centrally disposed edge for engaging the pusher rail, thereby to reduce friction and facilitate sliding movement.

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