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(58) Field of search

B7B

(54) Handcart handle height adjusting mechanism

(57) A mechanism for adjusting the height of the handle of a handcart.

The handle (11) comprises an upper rod portion (14) having a grip (16), and a lower rod portion (15) for vertically slidably supporting the upper rod portion (14). The lower rod portion (15) is formed with a vertically extending throughgoing elongated opening (22). The lower rod portion (15) has a pin attached thereto which passes through the elongated opening (22) in the lower rod portion (15) and whose opposite ends project out of the upper rod portion (14). One end of the pin (25) has a knob (26) fixed thereto which is positioned in contact with the outer surface of the upper rod portion (14). The other end of the pin (25) is formed with an external thread which is adapted to engage with an internal thread positioned on the outer surface of the upper rod portion (14). The upper rod portion (14) is formed with elongated cuts (31, 31) which cross the outer peripheral line of a cross-section of the upper rod portion (14) passing through the opposite ends of the pin (25).

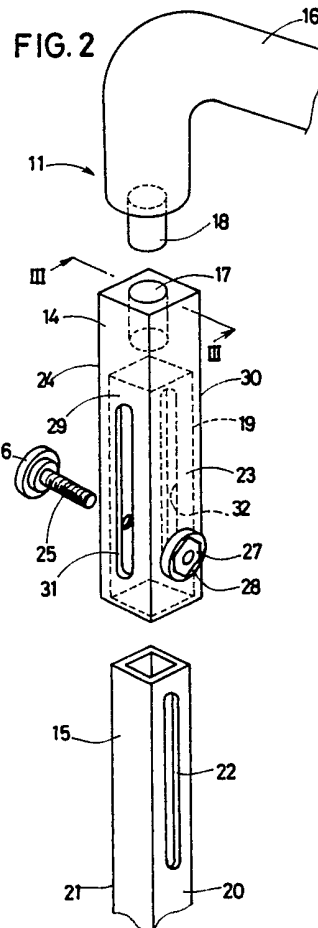
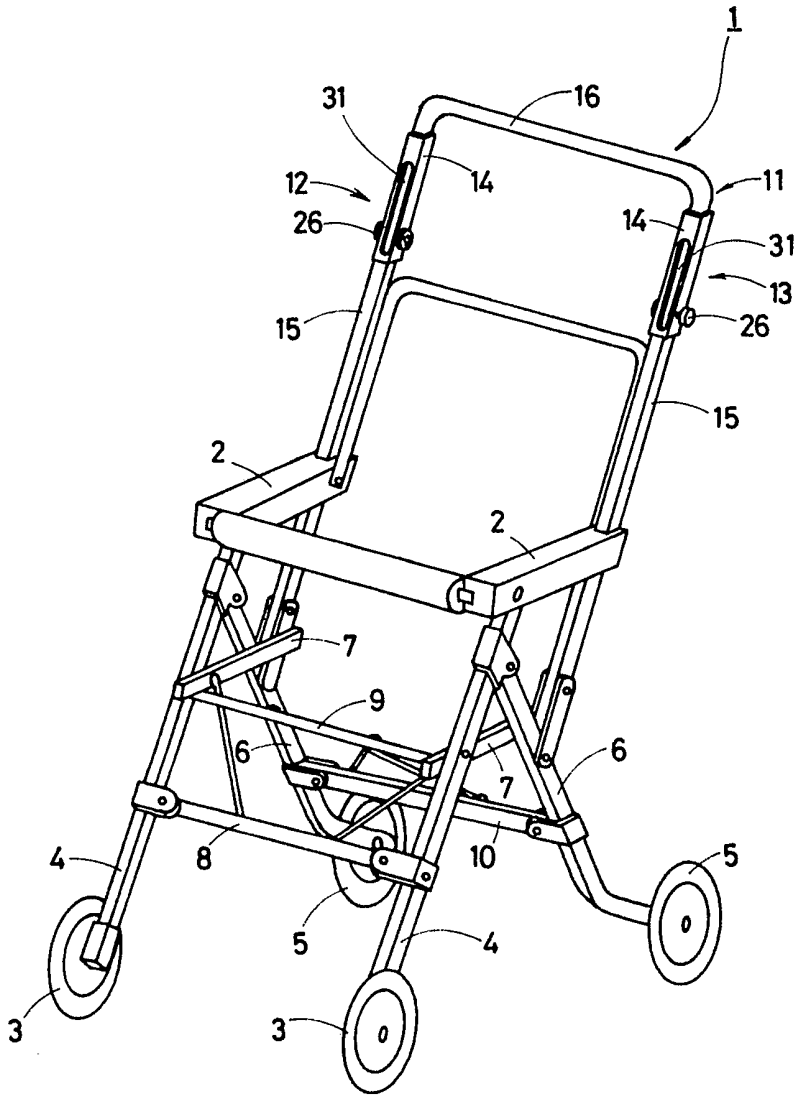


FIG. 1



SPECIFICATION

Handcart handle height adjusting mechanism

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BACKGROUND OF THE INVENTION

Field of the Invention

10 This invention relates to a mechanism for adjusting the height of the handle of the handcart.

DESCRIPTION OF THE PRIOR ART

15 Handcart, such as baby carriages and load carrying vehicles, are provided with a handle for the pusher to push them by hand. Generally, this handle is fixed to the handcart body and its height cannot be adjusted. As a result, there have been various inconveniences. That is, some of the persons who push handcarts are tall and others are short. These persons will feel it very inconvenient that the height of the handle cannot be changed.

25 SUMMARY OF THE INVENTION

Accordingly, an object of this invention is to provide a mechanism enabling the height of the handle of a handcart to be adjusted with ease.

30 According to this invention, the handle of a handcart comprises an upper rod portion having a grip, and a lower rod portion for vertically slidably supporting said upper rod portion. Either of the upper and lower rod portions forms a sleeve and the other forms an insert adapted to be received in the opening in the sleeve. The insert is formed with a vertically extending elongated opening. In connection therewith, the sleeve is provided with a pin which passes through the elongated opening in the sleeve and whose opposite ends project outside the sleeve. One end of the pin has a knob fixed thereto which is positioned in contact with the outer surface of the sleeve, while the other end is formed with an external thread. The external thread engages with an internal thread positioned on the outer surface of the sleeve. Further, the sleeve is formed with elongated cuts which cross the outer peripheral line of a cross-section of the sleeve passing through the opposite ends of the pin.

As described above, according to this invention, the handle to be pushed by hand comprises a sleeve, and an insert received in the opening in said sleeve and slidable relative to said sleeve. Further, the presence of the cuts allows the sleeve to deflect with ease to thereby produce a large amount of friction between the sleeve and the insert; thus, turning the knob makes it possible to inhibit relative slide between the sleeve and the insert. Therefore, the height of the handle can be suitably adjusted according to the stature of the person who pushes the handcart.

These objects and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a baby carriage having an embodiment of this invention applied thereto;

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Fig. 2 is a perspective view showing the principal portions of this invention in disassembled condition; and

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Fig. 3 is a sectional view taken along the line III-III of Fig. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

85 Referring to Fig. 1, a baby carriage 1 comprises handrails 2, front legs 4 each having a front wheel 3, rear legs 6 each having a rear wheel 5, seat support rods 7 for supporting a seat, connecting members 8, 9, and 10 for interconnecting right and left members, and a push rod, i.e., handle 11 connected at its lower end to the rear legs 6. The handle 11 is used when the baby carriage 1 is to be moved. This invention relates to a mechanism for adjusting the height of this handle.

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The push rod 11, in this embodiment, is an inverted U-shape as a whole with mechanisms for adjusting the height of the handle being installed on the right-hand and left-hand sides are shown by the reference numerals 12 and 13. The mechanism 12 on the right-hand side is the same in basic arrangement and also in operation as the mechanism 13 on the left-hand side. Thus, the following description is given using the right-hand side mechanism 12.

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Referring to Figs. 1 and 2, the handle 11 comprises upper rod portions 14, and lower rod portions 15. The upper rod portions 14 have a grip 16 to be gripped by the person who pushes the baby carriage. The upper rod portions 14 and the grip 16 may be fixed together. Alternatively, they may be constructed as follows: The upper end of each upper rod portion 14 is formed with a circular opening 17, while the lower end of the grip 16 is formed with a circular projection 18. Thus, by engaging the opening 17 and the projection 18 with each other, the grip 16 can be attached to the upper rod portion 14. In addition, if the grip 16 is collapsible, the same arrangement may be supplemented with a design which allows the projection 18 to turn inside the opening 17.

The lower rod portion 15 supports the upper rod portion 14 for vertical slide movement. More particularly, the upper rod portion 14 forms a sleeve internally having an opening 19, while the lower rod portion 15 forms an insert adapted to be slidably received in

said opening 19 from one end of the upper rod portion 14. In addition the upper and lower rod portions 14 and 15 are quadrangular in cross-section, in this embodiment.

5 As shown in Fig. 2, the lower rod portion 15 is formed with vertically extending elongated opening 22 which passes from the left-hand side surface 20 to the right-hand surface 21. The upper rod portion 14 is provided with a pin 25 which, when the lower rod portion 10 15 is inside the opening 19 in the upper rod portion 14, extends through the elongated opening 22 in the lower rod portion 14 and whose opposite ends project beyond the left-hand and right-hand side surfaces 23 and 24. 15 This state is seen in Fig. 3. As shown, one end of the pin 25 has a knob 26 fixed thereto which is positioned in contact with the right-hand side surface 24 of the upper rod portion 20 14. The other end of the pin 25 is formed with an external thread adapted to engage with the internal thread of a nut 27 positioned on the left-hand side surface 23 of the upper rod portion 14. Preferably, the left-hand side 25 surface 23 of the upper rod portion 14 is formed with a nut receiving projection 28 for receiving the nut 27 and inhibiting rotation of the nut 27.

Further, the front and back surfaces 29 and 30 30 of the upper rod portion 14 are formed with vertically extending cuts 31 and 32, respectively. These cuts 31 and 32 are positioned so that they cross the outer peripheral line of a cross-section of the upper rod portion 35 14 passing through the opposite ends of the pin 25. In other words, they are positioned so that their upper ends are located above the pin 25 and their lower ends are located below the pin 25.

40 The operation will now be described.

Since the pin 25 with the knob 26 fixed at one end thereof is engaged with the nut 27, turning the knob 26 in a predetermined direction causes the upper rod portion 14 to 45 deflect inwardly, with the result that the right-hand and left-hand side walls 24 and 23 of the upper rod portion 14 move toward each other. In this case, since the cuts 31 and 32 are formed in the front and back walls 29 and 50 30 of the upper rod portion 14, the upper rod portion 14 can be deflected easily even with a small force and the amount and extent of deflection can be increased. Further, since the upper rod portion 14 can be deflected without 55 much effort, damage to the upper rod portion 14 can be minimized. Thus, when the knob 26 is turned by a predetermined amount in a predetermined direction, the right-hand and left-hand side walls 24 and 23 of the upper 60 rod portion 14 are deflected, with the result that the right-hand and left-hand side surfaces 21 and 20 of the lower and portion 15 positioned in the interior are pressed. Therefore, much friction is produced between the 65 right-hand side wall 24 of the upper rod

portion 14 and the right-hand side wall 21 of the lower rod portion 15, and between the left-hand side wall 23 of the upper rod portion 14 and the left-hand side wall 20 of the lower 70 rod portion 15, thereby inhibiting slide movement of the upper rod portion 14.

In addition, to ensure easier deflection of the upper rod portion 14, it is preferable that the upper rod portion 14 be made of a 75 flexible material such as plastics.

When it is desired to change the height of the handle, first the knob 26 is turned in a predetermined direction to widen the distance between the right-hand and left-hand side 80 walls 24 and 23 of the upper rod portion 14. Thereupon, the deflection of the right-hand and left-hand side walls 24 and 23 disappears and so does the friction between the right-hand side wall 24 of the upper rod portion 14 85 and the right-hand side wall 21 of the lower rod portion 15 and between the left-hand side wall 23 of the upper rod portion 14 and the left-hand side wall 20 of the lower rod portion 15; thus, the upper rod portion 14 is allowed 90 to slide with ease on the lower rod portion 15 within the range allowed by the pin 25 moving in the elongated opening 22. Then, the upper rod portion 14 is moved to a suitable position, whereupon the knob 26 is turned in 95 a predetermined direction to inhibit the slide movement. In this way the height of the handle can be easily adjusted.

The handle height adjusting mechanism described with reference to Figs. 1 through 3 is 100 an embodiment of this invention shown by way of example. Therefore, various changes or modifications are possible. A typical modification will now be described.

First, attention is given to the cuts 31 and 105 32. In the illustrated embodiment, the cuts have been formed in the front and back surfaces 29 and 30 of the upper rod portion 14. However, considering that the purpose of the cuts is to allow the upper rod portion 14 110 to deflect with ease, only either the front surface 29 or the back surface 30 may be formed with such cut. Alternatively, a plurality of cuts may be formed in the front surface 29 or the back surface 30 or both. Further, in the 115 illustrated embodiment, the cuts have been shown extending vertically in parallel with the direction of the length of the upper rod portion 14, but they may extend obliquely. In short, so long as they are elongated cuts 120 crossing the outer peripheral line of the cross-section passing through the opposite ends of the pin 25 having the knob 26 at one end thereof, the number, the way they extend or the position may be arbitrarily determined.

125 In the illustrated embodiment, both of the upper and lower rod portions 14 and 15 have been quadrangular in cross-section. However, they may have a circular cross-section. In this case also, there is no possibility of the upper 130 rod portion 14 rotating on the lower rod

portion 15. The reason is that such rotation is inhibited by the fact that the pin 25 attached to the upper rod portion 14 engages with the elongated opening 22 formed in the lower rod portion 15.

In the embodiment described above, the upper rod portion 14 forms a sleeve, while the lower rod portion 15 forms an insert adapted to be received in the opening in the sleeve. However, this arrangement may be reversed. That is, the lower rod portion 15 may form a sleeve and the upper rod portion 14 may form an insert.

Further, a baby carriage has been shown as an example of a handcart to which the invention is applied. However, the type of the baby carriage is not limited to the illustrated type and may be any other one. For example, it may be a baby carriage of the type in which the grip 16 is made collapsible, as described previously. Further, examples of handcarts are not limited to baby carriages and include shopping carts and load carrying vehicles.

Although the present invention has been described and illustrated in detail, it is clearly understood that the same is by way of illustration and example only and is not to be taken by way of limitation, the scope of the present invention being limited only by the terms of the appended claims.

CLAIMS

1. A mechanism for adjusting the height of the handle (11), wherein:

said handle (11) comprises an upper rod portion (14) having a grip (16), and a lower rod portion (15) vertically slidably supporting said upper rod portion (14);

either said upper rod portion (14) or said lower rod portion (15) forms a sleeve, while the other forms an insert adapted to be received in the opening (19) in said sleeve;

said insert is formed with a vertically extending throughgoing elongated opening (22);

said insert has a pin (25) attached thereto which passes through said elongated opening (22) in said insert and whose opposite ends project out of said sleeve;

one end of said pin (25) has a knob (26) fixed thereto which is positioned in contact with the outer surface of said sleeve, while the other end of said pin (25) is formed with an external thread which is adapted to engage with an internal thread positioned on the outer surface of said sleeve; and

said sleeve is formed with elongated cuts (31, 32) which cross the outer peripheral line of a cross-section of the sleeve passing through the opposite ends of said pin (25).

2. An adjustable handle for a handcart which comprises a sleeve, an insert adjustably received within the sleeve, and clamping means for clamping the sleeve onto the insert for holding the insert and sleeve in a desired position, the sleeve having elongate openings

in the wall thereof enabling the sleeve to deform more readily onto the insert under the action of the clamping means.

3. An adjustable handle for a handcart substantially as hereinbefore described with reference to the accompanying drawings.

4. A handcart having an adjustable handle according to any of the preceding claims.

5. A baby carriage substantially as hereinbefore described with reference to the accompanying drawings.

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