

PATENT SPECIFICATION (11)

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(54) COLLAPSIBLE BABY STROLLER

(71) We, RAFFAELE GIORDANI S.p.A., a Joint-stock Company, of Via Cimarosa, 5-Casalecchio di Reno, Province of Bologna, Italy, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a collapsible baby carriage.

Attempts have been made to provide baby carriages of variable dimensions, which are conveniently carried in the manner of a walking stick even on buses or analogous transport means when in the collapsed position.

These carriages are formed by a number of mutually articulated tubular rod elements, which provide both the wheel supports, the handgrips and the seat attachments.

The carriages at present manufactured require numerous component parts such as tubular elements and links and remarkable care in the study of the kinematic movements thereof. Moreover it is necessary to provide numerous articulations to interconnect the tubular elements. These articulations are costly and are in addition the cause of possible breakages and bindings. On the whole therefore the structure of these previous carriages are relatively complex and costly, as well as rather cumbersome. This last drawback is particularly annoying since manoeuvrability should be the basic characteristic of these carriages. Furthermore it should be observed that these previous carriages have a relatively short span between the sides when in open position so that the baby seated therein is in a rather uncomfortable position.

The object of the present invention is to provide a baby stroller whose structure is such that it reduces the above specified inconveniences.

This object is attained by the collapsible baby carriage according to the present invention, comprising an articulated frame supporting a seat and a control rod provided with a handle and movable between two end positions corresponding to the opening and closing condition of the frame, two front

wheels and two rear wheels each of which is rotatably supported on an oscillating arm wherein all the oscillating arms are hinged on a supporting body in which a guide for the control rod is formed, said rod having the end opposite to that provided with the handle projecting below said supporting body and connected with said oscillating arms by means of levers so that by actuating the control rod from one end position into the other, opening and folding up of the oscillating arms is achieved.

Further details of the invention will be more evident from the description of a carriage illustrated by way of an example in the accompanying drawings in which:

Fig. 1 is a rear view of the carriage according to the invention in open position;

Fig. 2 is a lateral view of the carriage illustrated in Fig. 1;

Figs. 2a and 2b show details of pivot elements in perspective views;

Fig. 3 shows the carriage in another folding position;

Fig. 4 is a lateral view of the carriage in folded position or configuration;

Fig. 5 is a rear view of the carriage in folded position;

Fig. 6 shows the structure of the carriage from underneath in open position;

Fig. 7 is a view from underneath of the carriage in folded position;

Fig. 8 shows a structural detail of the carriage according to the invention.

With reference to the above figures, the carriage comprises a rigid supporting body consisting of a back rest 1 having a flat structure, preferably made of sufficiently rigid plastics material, with weight reducing holes 101 and hollow stiffening ribs 201 on the rear side. The lower end of the back rest 1 extends at an angle forwards with respect to the back rest to form a projection 1a on which an arcuated plate 1b is fixed by non visible rivets. On the rear side of the back rest 1 there is provided a supporting body 301 integral with the back rest. As best visible in Fig. 8, on the lower side of the supporting body 301 and of the projection 1a U-shaped recesses 2, 3, 4 and 5 are formed, which are symmetrically arranged with re-

spect to the vertical symmetry plane of the carriage. The recesses 2, 3 extend below the projection 1a and diverge down- and forwards, whereas the recesses 4, 5 extend below the body 301 and diverge down- and rear-wardly.

In the recesses 2-5 the upper ends of oscillating arms 6, 7, 8, 9 are engaged. The arms 6-9 have a hollow rectangular cross-section and are hinged in the recesses 2, 3, 4 and 5 by means of pins 7¹ arranged in holes 3¹, 4¹, 5¹ of the recesses.

The fore arms 6 and 7 are of the same length and are provided at their ends with the front wheels 400 whereas the rear arms 8 and 9 have a minor length than that of the fore arms and are provided at their ends with the rear wheels 401. When the carriage is in operative or open position, the arms 6, 7, 8 and 9 rest against the bottom of the respective recesses 2, 3, 4 and 5 and are prevented by the side walls of these latter from carrying out undesirable swinging or bending movements.

The arms 6-9 are convergent towards a rod 28 which will be described later so that when the arms are folded to form a bundle below the rest back, the wheels 400, 401 may be moved still closer to each other in the folded position of the carriage, without mutual interference, as visible in Fig. 7. This is possible since the fore arms 6, 7 have a greater length than the rear arms 8, 9 so that in folded position the wheels 401 are arranged above the wheels 400, thus reducing the occupied space. In an intermediate position of the oscillating arms 6-9, the ends of levers 23, 24, 25 and 26 are pivoted, whose opposite ends are pivotally connected with appendices of a sleeve member 27. The member 27 is attached by rivets (not shown) to the lower end of the aforementioned tubular control rod 28 which has a square cross-section and which is axially slidable in aligned sleeve guides provided in the members 29 and 30 arranged at a distance from each other on the rear side of the back rest 1 and in the supporting body 301. As visible in Fig. 6, the end portions of the levers 23, 24, 25 and 26 are bent to form pivot-like extensions perpendicular thereto and journaled in holes provided in the respective arms and in the appendices of the member 27. The pivot-like extensions of each lever are parallel to each other and to the hinge axis of the respective arm in the supporting body 301 and projection 1a. Thus for example the two opposite pivot-like extensions of the lever 24 are parallel to each other and to the hinge axis defined by the pivot 7¹ in the supporting body 301 on which arm 7 is hinged.

In this way an articulated lever system is obtained by means of which the arms 6, 7, 8 and 9 may be folded and opened in an um-

brella like manner by axially shifting the control rod 28.

The carriage comprises further component parts designed to support in a collapsible manner the bag like seat thereof. These additional component parts comprise lateral bars 12 and 13 symmetrically arranged at both lateral sides of the rigid back rest 1.

The bars 12 and 13 are linked at the upper end of the rest back 1 by U-shaped links 16 and 17 each hinged with one arm 16¹, 17¹ thereof to the upper ends of bars 12 and 13 respectively and with the other arm 16¹¹, 17¹¹ thereof to the member 20 provided near the upper end of the rigid back rest 1 and cast integral therewith. The arms 16¹ and 16¹¹ are properly inclined with respect to each other as best visible in Fig. 2a in order to perform a combined swinging movement both about the arm 16¹ and 16¹¹. The same considerations apply for arms 17¹ and 17¹¹ and bar 13.

The lower ends of the bars 12 and 13 are linked to the arms 6 and 7, near the lower ends thereof, through L-shaped pivots 10 and 11. The L-shaped pivot 10 is illustrated in Fig. 2b. Pivot 11 is similar in structure. In this way bars 12, 13 may perform a relative swinging movement with respect to the arms 6, 7 about both pivot arms of the pivot 10 while arms 6, 7 oscillate from the folded into the open position.

On the upper zone of the back rest 1 above the member 20 and on the bars 12, 13 the seat 21 is fixed consisting of flexible properly padded material. The seat is formed so as to provide a comfortable support for the baby, in particular so that the back lies on the back rest. A flexible band 22 acting as foot-rest is attached by its ends to the lower portion of the bars 12 and 13.

The rod 28 projects with its upper end above the back rest 1 and on this upper end a block 31 is rigidly provided wherein two handgrips 32 in the shape of umbrella handles can rotate and which serve to push or pull the carriage.

Means for blocking the sliding axial movement of the rod 28 with respect to the back 1 are also provided. Said means consist of a handle 20 rigid to the back 1, on its upper rear portion, and projecting rear-wardly and provided with a mobile lever element 14 having a pin 15 engaging appropriate holes provided in succession along the rod 28. The engagement is maintained by a compression spring situated between the element 14 and the handle 20.

To improve the stability of the carriage in open position, there is provided a foldable cross-piece 150 arranged between and articulated with its opposite ends onto the bars 12 and 13. The cross-piece 150 is made of two sections pivoted in articulated fashion on a connection element 151 at the center of

the cross-piece. In order to aid the opening and closing movements of the articulated cross-piece 150, two forks 152 are provided rigid with the levers 23, 24 and engaging in open position both sections of the articulated cross-piece 150 in an intermediate position thereof.

In folded position the forks 152 are moved away from the cross-piece 50 (Fig. 3).

The operation of the carriage is the following.

To fold the carriage, the handgrips 32 are rotated forwardly until they are mutually juxtaposed (Figures 2, 4 and 5) and then the handle 20 and the handgrips 32 are grasped. The lever element 14 is pressed thereby freeing the pin 15 from the hole of the rod 28 to allow the rod 28 to move axially in its guide sleeves. Then the rod 28 is pushed downwardly so that the levers 23-26 and the oscillating arms rotate to assume a folding position as shown in Figs. 2, 3 and 4. At the same time the bars 12, 13 follow the movement of the fore arms 6, 7 and approach each other close to the side borders of the back rest 1.

It will be appreciated that in the open position the fork 152 is urged to press its upper prong downwardly against the cross-piece 150 as shown in Fig. 2. In this way the carriage is locked in the open position. In addition engagement of the pin 15 in the lower hole of the rod 28 causes additionally locking of the carriage in its open position. At the beginning of the folding action, after having disengaged the pin 15 from its hole on the rod 28 when rod 28 is downwardly pushed, the fork 152 is rotated clockwise as shown in Fig. 2 so that the lower prong of fork 152 pushes the cross-piece 150 upwardly thereby causing the two sections of the cross-piece 150 to fold and disengage from the fork 152. It will be understood that once the carriage is in the folded position indicated in Figures 4 and 5, it is prevented from opening when carried by its handles 32, by inserting the pin 15 of the handle 20 in a hole provided in the rod 28 which is thus blocked in its guide channel 29.

WHAT WE CLAIM IS:—

1. Collapsible baby carriage comprising an articulated frame supporting a seat and a control rod provided with a handle and movable between two end positions corresponding to the opening and closing condition of the frame, two front wheels and two rear wheels each of which is

rotatably supported on an oscillating arm wherein all the oscillating arms are hinged on a supporting body in which a guide for the control rod is formed, said rod having the end opposite to that provided with the handle projecting below said supporting body and connected with said oscillating arms by means of levers so that by actuating the control rod from one end position into the other, opening and folding up of the oscillating arms is achieved.

2. Collapsible baby carriage as claimed in claim 1 wherein the supporting body is rigidly connected with a back rest for the seat and is provided on the rear side with sleeve members for the control rod.

3. Collapsible baby carriage as claimed in claim 2 wherein the oscillating arms supporting the two front wheels have greater length than those supporting the two rear wheels and that the control rod is inclined so that the lower portion extends forward with respect to the upper position.

4. Collapsible baby carriage according to claim 3 wherein on the front oscillating arms two respective lateral bars are articulated, whose upper ends are connected by means of links with the upper portion of the back rest and which, in the opening arrangement of the carriage, form an arm support and that the seat is in the form of a bag which has lateral margins attached to said bars and rests rearward on the back rest and downward on a projection of the supporting body.

5. Collapsible baby carriage according to claim 4 wherein the oscillating arms are hinged on the supporting body so that their oscillation planes are substantially vertical and converging to the control rod.

6. Collapsible baby carriage according to claim 5 wherein on the back rest a lever is articulated and is provided with a pin adapted by means of a spring working on said lever to engage holes provided in the control rod and corresponding to the opening and folding up condition of the carriage.

7. A collapsible baby carriage according to Claim 1 and substantially as hereinbefore described with reference to the accompanying drawings.

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5. Collapsible baby carriage according to claim 4 wherein the oscillating arms are hinged on the supporting body so that their oscillation planes are substantially vertical and converging to the control rod.

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