L. W. TAYLOR.

FOLDING CARRIAGE.

APPLICATION FILED OCT. 12, 1920.

1,438,466.

Patented Dec. 12, 1922.

2 SHEETS—SHEET 1.

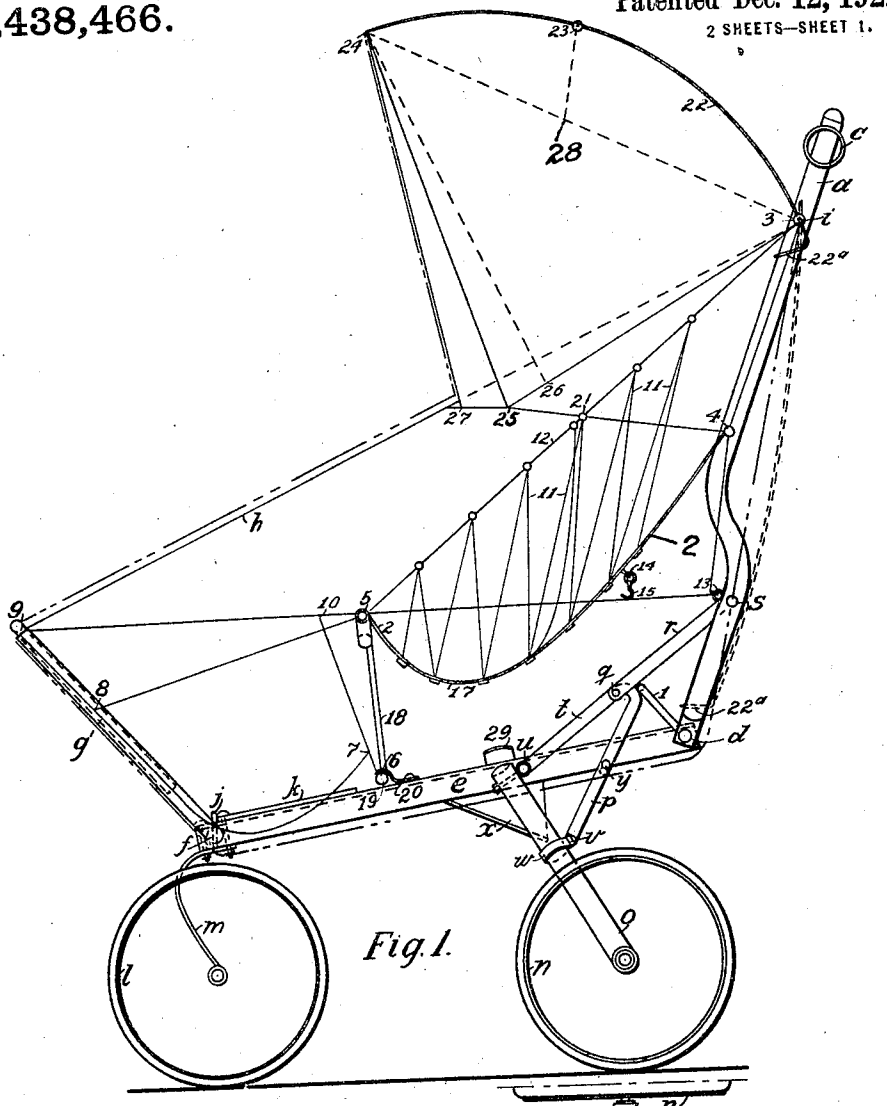


Fig. 1.

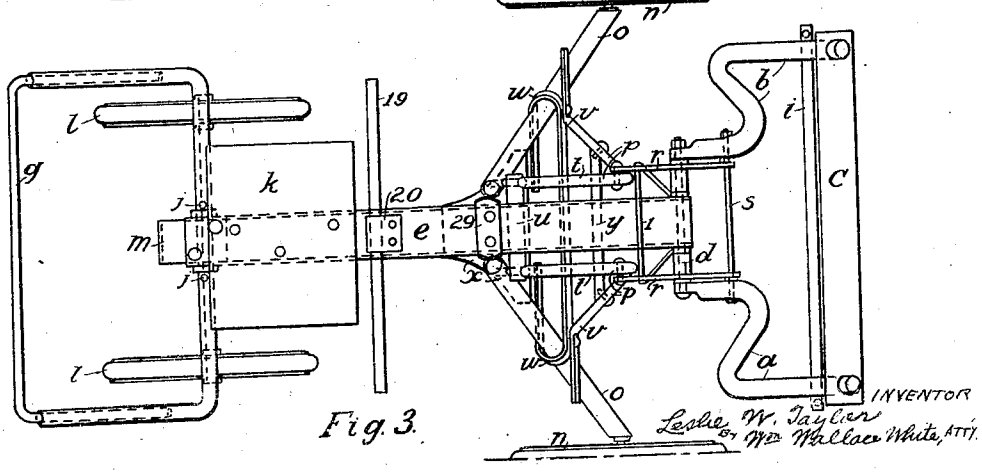


Fig. 3.

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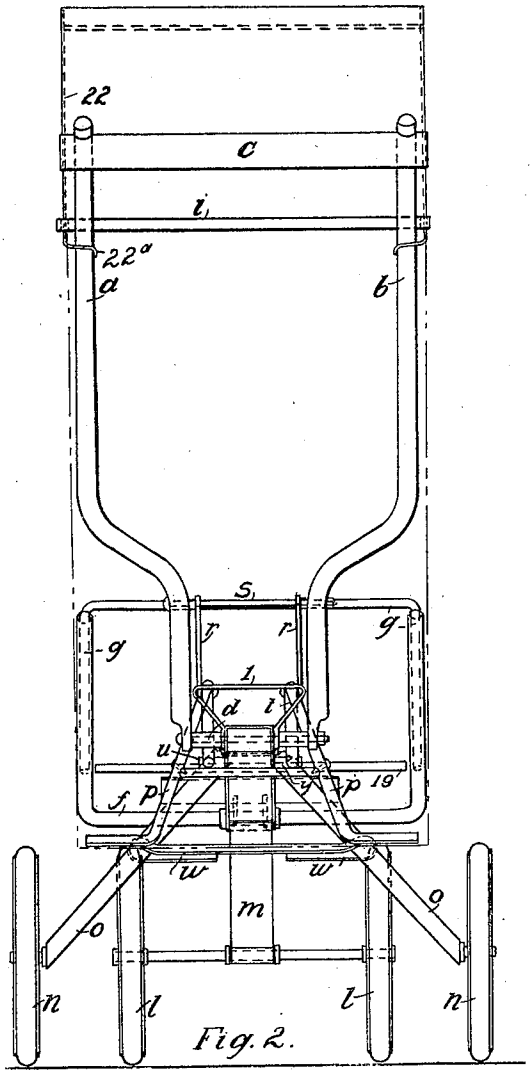


Fig. 2.

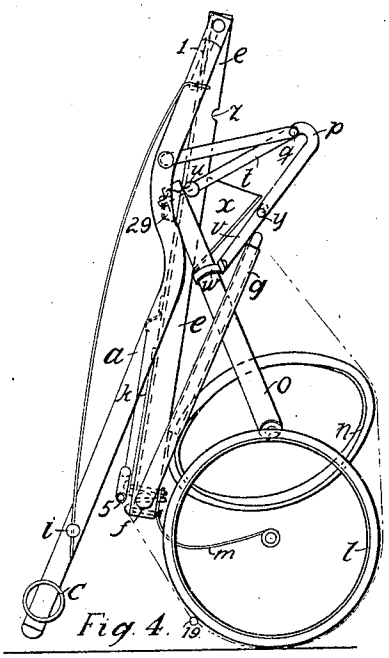


Fig. 4.

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UNITED STATES PATENT OFFICE.

LESLIE WASHBURNE TAYLOR, OF ULVERSTON, ENGLAND.

FOLDING CARRIAGE.

Application filed October 12, 1920. Serial No. 416,354.

To all whom it may concern:

Be it known that I, LESLIE WASHBURNE TAYLOR, a subject of the King of Great Britain and Ireland, residing at Ulverston, Lancashire, England, have invented new and useful Improvements in Folding Carriages, of which the following is a specification.

The present invention relates to folding carriages such as push-chairs, invalid chairs, perambulators and the like.

The object of the invention is to provide a carriage with a deck-chair support, convertible to a hammock, of simple construction which is light, easily folded into a small compass for carrying and unfolded ready for use. A further object of the invention is to provide means for covering the wheels when in a folded condition so as to prevent the wheels from soiling the clothes with which they may come into contact while the carriage is being carried.

Folding chairs are known but the characteristic feature of the invention hereinafter more particularly described resides in the fact that the front wheels always remain in a fixed position whilst the rear wheels are automatically operated by the folding mechanism to take up a folded position between the front wheels in respective planes which converge in the form of the letter V. A further characteristic feature is the provision of a pocket, formed in the fabric of the hammock or support for the occupant of the carriage that is suspended between two members of the collapsible frame which pocket covers the wheels of the carriage when the same is folded. A still further feature of the invention is the formation of the hood which can be fully opened or closed or retained in any intermediate position between the fully opened or totally closed positions.

The particular construction of a carriage in accordance with the invention and of its various parts and the manner in which it is folded up or collapsed and unfolded ready for use will be more readily understood from the following detailed description with reference to the accompanying drawings in which similar reference characters relate to corresponding parts in all the figures.

Figure 1, is an elevation of my invention as embodied by way of example in a child's push-chair and showing the same in its open or unfolded position ready for use.

Figure 2. is an end elevation and Figure 3 a plan of the push-chair shown in Figure 1. the hammock being omitted in these figures for the sake of clearness.

Figure 4. shows the push-chair almost completely collapsed or folded.

Referring to the said drawing it will be seen that the push-chair illustrated therein consists of a framework comprising the rear approximately vertical tubular members *a* and *b*, the upper ends of which pass through the tube *c* which forms the handle, the lower ends converging as shown and pivotally connected at *d* to the rear end of the approximately horizontal member *e* preferably of channel formation. The front of the frame is pivoted to the forward end of the channel *e* at *f* and is formed as shown by an open ended U-shaped tubular member *g*. The rear members *a* and *b* are maintained in a rigid position by the locking mechanism hereinafter described while the front member *g* is held up in the position shown by the tension of the cord *h* connecting it to the cross bar *i* carried by the tubes *a* and *b* and is prevented from falling back further by the projecting pins *j* which bear against the front edge of the footboard *k* attached to the channel *e*. The front wheels *l* are suspended from the fore end of the channel *e* by means of the curved spring *m* attached to their axle midway between the wheels *l* its upper end being bolted to the underside of the channel *e*. Each of the rear wheels *n* is carried by the lower end of the struts *o* the following construction being adopted in order to allow of the folding of the chair as hereinafter more particularly described:—*p* represents two-armed or V-shaped levers the tops or apices of which are pivoted at *q* to the lower ends of the levers *r* the upper ends of which are pivotally connected to the tubes *a* and *b* at *s*. The upper arms *t* of the levers *p* pass through and are secured to the rod *u* rotatably mounted in the channel *e* while the lower ends of the upper arms *t* pass through and secure the struts *o* which pivot thereon in folding and opening. By this construction a universal joint is obtained, the struts *o* pivoting in and out on the levers *p* and forwards and backwards when the rod *u* rotates. The lower arms *v* of the levers *p* are secured to a horizontal tie-bar *w* hooked at each end to receive the struts *o* and prevent these from spreading. *x* is a cam plate attached to the channel *e* in such a position as to spread the struts *o* to bear outwards against the hooks of the tie-bar *w*, and *y* a

cross bar between the two levers p and bearing in a slot z on the underside of the channel e. To prevent the struts o moving forwards and to lock the levers p and r in the position shown in Figure 1. the trip lever 1 is provided which is pivotally mounted on the pin d and bears as shown against the apices of the levers p and the underside of the levers r, and forces these upwards as far as the cross bar y will permit thus locking the entire folding mechanism.

The body supporting member which may be for convenience and is hereafter called "the hammock" consists of a single strip of fabric 2 suspended by coil springs, not shown on the drawing, from the cross bar i and is attached between the members a and b from 3 to 4 and continuing in a curve as shown to 5 thence 6, 7 over the footboard k to 8 and thence to 9, the ends are attached at 3 and 9 on to the members i and g. Two pieces of fabric, 9, 7, 10, are sewn from 9 to 7 one on each side to the side edges of the hammock forming what may be and is hereafter termed "the pocket." The upper portion of the hammock has sides of meshwork as shown consisting of cords 11 passing through the eyelets 12, tied at each end thus allowing the strip of fabric to be stretched horizontally between 5 and 13 by fixing the hook 15 of the rod 14 attached to the fabric, between the levers r over the rod s (Figure 3), the length of the rod 14 corresponding to the width of the hammock with the hook 15 situated midway thereon. If necessary for the support of the head of the child fabric may be substituted for the cords 11. An additional strip of fabric of the same width as the hammock is sewn to the same along its width at 17 and normally lies along 17 to 4, being attached by hooks at 4.

A cord 9, 5, 3, supports the child in the hammock which is attached to the cord at each of these three points. In order to keep the sides of the hammock apart the member 5 is provided as shown which is a bar of bow-shape in order to prevent it bearing on the legs of the child. 18 is a cord attached between 5 and the channel e of such a length as to hold the bar 5 back in the required position (Figure 4) when the pocket is turned inside out over the wheels n and l. This cord 18 also exerts a downward strain on the cord 9, 5, 3 at 5 so that when a child is in the hammock the resultant downward strain at 5 is barely sufficient to relax the strain on 18: 19 is a rod threaded in the seam of the hammock and is fixed in a clip 20 to tighten the fabric between 5, 6, and 10, 7, 6 and thus impart a neat appearance.

Two fabric covers are provided for the chair one on each side (shown for convenience in chain dotted lines in Figures 1, 2, and 4) and attached thereto between the points 9 and 3 by a cord passing through a seam in the edge of the fabric. The outer fabric covers are attached along the sides of the front member g on to a cord attachment to the ends of the levers p up to 4 and 3 and also at s.

The collapsible hood 22 comprises a frame formed of spring wire of U-shape, provided with hooks 22^a at each end to embrace the rear members a and b and distance pieces of stiff wire 23 the ends of which engage the two sides of the U so as to slide freely thereon. The fabric of the hood is attached to the wires 23 to the rod i and to the outer side covers of the chair. It is attached across the front edge of the frame wire at 24, thence over the top and to the cross rod i over which it extends slightly to carry rain drops clear of the chair. The sides of the hood are 24, 25, 3, 23, with a flap extension 24, 25, 26 which can be fixed by a press button to position 24, 25, 27. The sides are sewn to the top fabric along 24, 23, 3 and on to eyelets through which the frame side wires pass. The lower edge of the sides of the hood is attached at 25 and lies on the outside of the outer fabric covers.

The side wires of the frame are strained to a curve 24, 23, 3 by having to conform to the sides of the hood, the upward strain at the point of attachment 25 being taken by the cord h and the cord 27, 25, 4, which is attached to h and to the point 25, but on the inside of the outer cover, down to 4 on members a and b.

The hammock may be adjusted for various positions of the occupant. For an upright sitting position the end 4 of the additional strip of fabric 17, 4, is hooked to the eyelets at 21. In order to form a flat bed this additional strip of fabric 17, 4, is attached on to the member g at 8, the fabric of the pocket being engaged in the hooks and the hook 15 is passed over the rod s (Figure 3). To obtain a reclining position the additional strip 17, 4 may be either as shown on the drawing (Figure 1) or at 17, 8 the latter position affording a leg rest.

A child may sit in the chair "vis-à-vis" or facing the nurse by sliding the prongs of a U-shaped frame into the tubes forming the sides of the frame g and securing the same therein at any desired height by bolts. The top of the pocket spans the space between the ends of the frame g and this being of fabric is comfortable for a child to lean against as hereinafter described.

Two children can occupy the one chair by placing the additional strip either as shown at 17, 4, on the drawing (Figure 1) or at 17, 21. One child sits in the hammock and the other between the first child's legs in the pocket and on the footboard k and leans against the front fabric of the pocket, pass-

ing its legs through the gaps, 10, 6, 5 on each side of the hammock and places its feet on the end of the levers *p* which are for this purpose bent outwards (Figure 3).

The hood will stay in any intermediate position between fully opened and closed: the position being maintained by the bending strain on the side wires. Lateral stability is obtained by the diagonal bracing of the four top corners by tapes. This cross bracing is suspended in the centre at 28 to the centre of the distance piece wire 23 so as not to drag when the hood is closed.

In order to close the hood, the closed position being shown in dotted lines in Figure 1, the front flaps must be in the position 24, 25, 26. The hooks 22ª are detached from the tubes *a* and *b* and are pulled downwardly and attached to the lower end of the same. The wire guiding slots in the rod *i* retain the eyelets through which the wires slide and the fabric of the hood remains in folds between 25, 3 and across the top of the hood above the rod *i*. The distance 25, 3 must be less than from 25, to any point on the curve 24, 23, 3.

In order to collapse or fold up the chair the hood must first be closed in the manner just described, the additional fabric strip must be in either the position shown in Figure 1 or as adopted for the sitting position with the end 4 hooked to the eyelets at 21, the hammock may be in either the reclining or horizontal position. The trip lever 1 is then pulled back and the chair lifted off its rear wheels *n* by the same action the wheels *n* fall together as they pass the cam plate *x* and come between the two front wheels *l* in respective planes which converge in the form of the letter V. To ensure this action a cam plate 29 is provided which synchronizes with the cam *x* acts above the wheel strut hinges and forces the top of these struts apart and the wheels consequently fall together. The rear members *a* and *b* fall downwards and forwards in unison with the movements of the rear wheel struts *o*. The top of the front member *g* drops in a similar manner owing to the tension on the cords relaxing and is drawn by the hand over all four wheels (Figure 4) rod 19 detaches itself and the pocket is thereby turned inside out and covers all four wheels. The hammock and sides fall in vertical folds between their various points of attachment to the frame.

To unfold the chair it is merely necessary to raise it off the ground by the lever 1, draw the front frame *g* back over the wheels and the back members *a* and *b* upwards this also raises the front frame *g* and locks the parts by pressing the trip lever 1 with the foot into required position against the levers *p*. Finally pass the rod 19 under the clip 20.

It will be obvious from the foregoing description that in a folding carriage constructed according to this invention the occupant is supported in a hammock, which more or less conforms to the shape of the body, out of contact with any hard surface and suspended so as to reduce vibration to a minimum. Practically absolute protection is obtained from bad weather conditions especially in respect of the lower limbs which is very important in the case of young children.

The internal structure is completely hidden, the outer covers hiding all the frame-work and giving the vehicle a very attractive appearance and provision is made for two occupants each with a comfortable seat and back and foot rests. It makes a very compact parcel when folded and hangs clear of the body when carried by the bar *y* with the wheels pointing downwards. It is also quite stable when lowered to rest on the ground in the upright position in which it is carried. The weight moreover is centralized immediately below the handle in stable equilibrium which gives comfort in carrying and the large clearance from the ground enables the carrier to mount and descend steps with the carrying arm fully extended. The wheels being covered do not soil the clothes while the portion of the pocket which comes in contact with the wheels is on the reverse side so that used by the occupants of the carriage is out of sight when unfolded and can be easily cleansed by sponging when necessary.

What I claim is:—

1. In a folding carriage the combination with a light collapsible frame-work comprising front and rear approximately vertical members pivotally connectel to an approximately horizontal member, front wheels fixed to said approximately horizontal member, a body carrying member, and means for suspending said body carrying member between said front and rear approximately vertical members of the frame-work of folding mechanism, rear wheels carried by means forming part of said folding mechanism, and means for operating said folding mechanism whereby the rear wheels take up a folded position between the fixed front wheels in respective planes which converge in the form of the letter V.

2. In a folding carriage the combination with a light collapsible frame-work comprising front and rear approximately vertical members pivotally connected to an approximately horizontal member, front wheels fixed to said approximately horizontal member, a body carrying member, and means for suspending said body carrying member between said front and rear approximately vertical members of the frame-work of a pair of struts carrying the rear

wheels, interlocking pivotally mounted levers connected to said struts and means for operating said levers whereby the rear wheels take up a folded position between the fixed front wheels in respective planes which converge in the form of the letter V.

3. A folding carriage comprising the combination with a light collapsible framework carrying fixed front wheels, a body carrying member and means for suspending said body carrying member between two members of the framework of a pair of struts carrying the rear wheels, interlocking pivotably mounted levers connected to said struts, means for operating said levers whereby the rear wheels take up a folded position between the fixed front wheels in respective planes which converge in the form of the letter V, and a pocket formed in the fabric of which said body carrying member is composed, which pocket covers the wheels of the carriage when the same is folded.

4. A folding carriage comprising the combination with a light collapsible framework carrying fixed front wheels, outer covers of fabric wholly enclosing both sides of said framework, a body carrying member and means for suspending said body carrying member between two members of the framework of a pair of struts carrying the rear wheels, interlocking pivotably mounted levers connected to said struts, means for operating said levers whereby the rear wheels take up a folded position between the fixed front wheels in respective planes which converge in the form of the letter V, and a pocket formed in the fabric of which said body carrying member is composed, which pocket covers the wheels of the carriage when the same is folded.

5. In a folding carriage the combination with a light collapsible frame-work comprising front and rear approximately vertical members pivotally connected to an approximately horizontal member, front wheels fixed to said approximately horizontal member, outer covers of fabric wholly enclosing both sides of said frame-work, a body carrying member and means for suspending said body carrying member between said front and rear approximately vertical members of folding mechanism, rear wheels carried by means forming part of said folding mechanism, means for operating said folding mechanism, whereby the rear wheels take up a folded position between the fixed front wheels in respective planes which converge in the form of the letter V and a collapsible hood comprising a hood frame member slidably mounted on a cross bar carried by the aforesaid rear approximately vertical members and a hood fabric member attached to said frame member and the aforesaid outer fabric covers.

In testimony whereof I have signed my name to this specification.

LESLIE WASHBURNE TAYLOR.