

JS 44 (Rev. 3/99)

**CIVIL COVER SHEET**

**APPENDIX H**

The JS-44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

**I. (a) PLAINTIFF**

GRACO CHILDREN'S PRODUCTS, INC.  
150 Oaklands Boulevard  
Exton, PA 19341

(b) County of Resident of First Listed Plaintiff Chester County, PA  
(EXCEPT IN U.S. PLAINTIFF CASES)

(c) Attorney's (Firm Name, Address, and Telephone Number)  
Lynn E. Rzonca, Esquire 215-864-8109  
Melissa E. Scott, Esquire 215-864-8314  
Ballard Spahr Andrews & Ingersoll, LLP  
1735 Market St., 51<sup>st</sup> Fl., Phila., PA 19103

**DEFENDANTS**

CHICCO USA, INC.  
1835 Freedom Road  
Lancaster, PA 17601

County of Residence of First Listed Defendant Lancaster County, PA  
(IN U.S. PLAINTIFF CASES ONLY)

NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED.

Attorneys (If Known)

**II. BASIS OF JURISDICTION** (Place an "X" in One Box Only)

- 1 U.S. Government Plaintiff  
 3 Federal Question (U.S. Government Not a Party)  
 2 U.S. Government Defendant  
 4 Diversity (Indicate Citizenship of Parties in Item III)

**III. CITIZENSHIP OF PRINCIPAL PARTIES** (Place an "X" in One Box for Plaintiff and One Box for Defendant)

	PTF	DEF		PTF	DEF
Citizen of This State	<input type="checkbox"/> 1	<input type="checkbox"/> 1	Incorporated or Principal Place of Business In This State	<input type="checkbox"/> 4	<input type="checkbox"/> 4
Citizen of Another State	<input type="checkbox"/> 2	<input type="checkbox"/> 2	Incorporated and Principal Place Of Business in Another State	<input type="checkbox"/> 5	<input type="checkbox"/> 5
Citizen or Subject of a Foreign Country	<input type="checkbox"/> 3	<input type="checkbox"/> 3	Foreign Nation	<input type="checkbox"/> 6	<input type="checkbox"/> 6

**IV. NATURE OF SUIT** (Place an "X" in One Box Only)

CONTRACT	TORTS	FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES	
<input type="checkbox"/> 110 Insurance <input type="checkbox"/> 120 Marine <input type="checkbox"/> 130 Miller Act <input type="checkbox"/> 140 Negotiable Instrument <input type="checkbox"/> 150 Recovery of Overpayment & Enforcement of Judgment <input type="checkbox"/> 151 Medicare Act <input type="checkbox"/> 152 Recovery of Defaulted Student Loans (Excl. Veterans) <input type="checkbox"/> 153 Recovery of Overpayment of Veteran's Benefits <input type="checkbox"/> 160 Stockholders' Suits <input type="checkbox"/> 190 Other Contract <input type="checkbox"/> 195 Contract Product Liability  <b>REAL PROPERTY</b> <input type="checkbox"/> 210 Land Condemnation <input type="checkbox"/> 220 Foreclosure <input type="checkbox"/> 230 Rent Lease & Ejectment <input type="checkbox"/> 245 Tort Product Liability <input type="checkbox"/> 290 All Other Real Property	<b>PERSONAL INJURY</b> <input type="checkbox"/> 310 Airplane <input type="checkbox"/> 315 Airplane Product Liability <input type="checkbox"/> 320 Assault, Libel & Slander <input type="checkbox"/> 330 Federal Employers' Liability <input type="checkbox"/> 340 Marine <input type="checkbox"/> 345 Marine Product Liability <input type="checkbox"/> 350 Motor Vehicle <input type="checkbox"/> 355 Motor Vehicle Product Liability <input type="checkbox"/> 360 Other Personal Injury  <b>CIVIL RIGHTS</b> <input type="checkbox"/> 441 Voting <input type="checkbox"/> 442 Employment <input type="checkbox"/> 443 Housing/Accommodations <input type="checkbox"/> 444 Welfare <input type="checkbox"/> 440 Other Civil Rights	<b>PERSONAL INJURY</b> <input type="checkbox"/> 362 Personal Injury-Med. Malpractice <input type="checkbox"/> 365 Personal Injury-Product Liability <input type="checkbox"/> 368 Asbestos Personal Injury Product Liability  <b>PERSONAL PROPERTY</b> <input type="checkbox"/> 370 Other Fraud <input type="checkbox"/> 371 Truth in Lending <input type="checkbox"/> 380 Other Personal Property Damage <input type="checkbox"/> 385 Property Damage Product Liability  <b>PRISONER PETITIONS</b> <input type="checkbox"/> 510 Motions to Vacate Sentence Habeas Corpus: <input type="checkbox"/> 530 General <input type="checkbox"/> 535 Death Penalty <input type="checkbox"/> 540 Mandamus & Other <input type="checkbox"/> 550 Civil Rights <input type="checkbox"/> 555 Prison Condition	<input type="checkbox"/> 610 Agriculture <input type="checkbox"/> 620 Other Food & Drug <input type="checkbox"/> 625 Drug Related Seizure of Property 21 USC <input type="checkbox"/> 630 Liquor Laws <input type="checkbox"/> 640 R.R. & Truck <input type="checkbox"/> 650 Airline Regs. <input type="checkbox"/> 660 Occupational Safety/Health <input type="checkbox"/> 690 Other  <b>LABOR</b> <input type="checkbox"/> 710 Fair Labor Standards Act <input type="checkbox"/> 720 Labor/Mgmt. Relations <input type="checkbox"/> 730 Labor/Mgmt Reporting & Disclosure Act <input type="checkbox"/> 740 Railway Labor Act <input type="checkbox"/> 790 Other Labor Litigation <input type="checkbox"/> 791 Empl. Ret. Inc. Security Act	<input type="checkbox"/> 422 Appeal <input type="checkbox"/> 423 Individual 28 USC 157  <b>PROPERTY RIGHTS</b> <input type="checkbox"/> 820 Copyrights <input checked="" type="checkbox"/> 830 Patent <input type="checkbox"/> 840 Trademark  <b>SOCIAL SECURITY</b> <input type="checkbox"/> 861 HIA (1395ff) <input type="checkbox"/> 862 Black Lung (923) <input type="checkbox"/> 863 DIWC/DIWW (405(G)) <input type="checkbox"/> 864 SSID Title XVI <input type="checkbox"/> 765 RSI (405(g))  <b>FEDERAL TAX SUITS</b> <input type="checkbox"/> 870 Taxes (U.S. Plaintiff or Defendant) <input type="checkbox"/> 871 IRS--Third Party 26 USC 7609	<input type="checkbox"/> 400 State Reapportionment <input type="checkbox"/> 410 Antitrust <input type="checkbox"/> 430 Banks and Banking <input type="checkbox"/> 450 Commerce/ICC Rates/etc. <input type="checkbox"/> 460 Deportation <input type="checkbox"/> 470 Racketeer Influenced and Corrupt Organizations <input type="checkbox"/> 810 Selective Service <input type="checkbox"/> 850 Securities/Commodities/Exchange <input type="checkbox"/> 875 Customer Challenge 12 USC 3410 <input type="checkbox"/> 890 Other Statutory Actions <input type="checkbox"/> 891 Agricultural Acts <input type="checkbox"/> 892 Economic Stabilization Act <input type="checkbox"/> 893 Environmental Matters <input type="checkbox"/> 894 Energy Allocation Act <input type="checkbox"/> 895 Freedom of Information Act <input type="checkbox"/> 900 Appeal of Fee Determination Under Equal Access to Justice <input type="checkbox"/> 950 Constitutionality of State Statutes

**V. ORIGIN** (Place an "X" in One Box Only)

- 1 Original Proceeding  
 2 Removed from State Court  
 3 Remanded from Appellate Court  
 4 Reinstated or Reopened  
 5 Transferred from another district (specify)  
 6 Multidistrict Litigation  
 7 Appeal to District Judge from Magistrate Judgment

**VI. CAUSE OF ACTION**

(Cite the U.S. Civil Statute under which you are filing and writ brief statement of cause. (Do not cite jurisdictional statutes unless diversity.)

35 U.S.C. § 101

Brief description of cause:

Patent Infringement

**VII. REQUESTED IN COMPLAINT**

CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23

**DEMAND \$**

CHECK YES only if demanded in complaint:

**JURY DEMAND:**  Yes  No

**VIII. RELATED CASE(S) IF ANY**

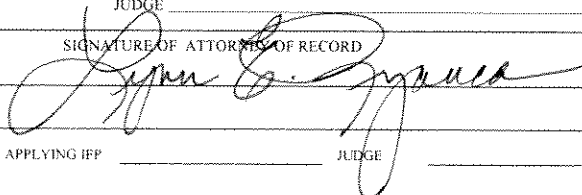
(See instructions):

JUDGE \_\_\_\_\_

DOCKET NUMBER \_\_\_\_\_

DATE  
March 12, 2007

SIGNATURE OF ATTORNEY OF RECORD



FOR OFFICE USE ONLY

RECEIPT # \_\_\_\_\_ AMOUNT \_\_\_\_\_ APPLYING IFP \_\_\_\_\_ JUDGE \_\_\_\_\_ MAG. JUDGE \_\_\_\_\_

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF PENNSYLVANIA**

**CASE MANAGEMENT TRACK DESIGNATION FORM**

GRACO CHILDREN'S PRODUCTS, INC.	:	CIVIL ACTION
	:	
v.	:	
	:	
CHICCO USA, INC.	:	NO.

In accordance with the Civil Justice Expense and Delay Reduction Plan of this court, counsel for plaintiff shall complete a case Management Track Designation Form in all civil cases at the time of filing the complaint and serve a copy on all defendants. (See § 1:03 of the plan set forth on the reverse side of this form.) In the event that a defendant does not agree with the plaintiff regarding said designation, that defendant shall, with its first appearance, submit to the clerk of court and serve on the plaintiff and all other parties, a case management track designation form specifying the track to which that defendant believes the case should be assigned.

**SELECT ONE OF THE FOLLOWING CASE MANAGEMENT TRACKS:**

- (a) Habeas Corpus – Cases brought under 28 U.S.C. §2241 through §2255.
- (b) Social Security – Cases requesting review of a decision of the Secretary of Health and Human Services denying plaintiff Social Security Benefits.
- (c) Arbitration – Cases required to be designated for arbitration under Local Civil Rule 53.2.
- (d) Asbestos – Cases involving claims for personal injury or property damage from exposure to asbestos.
- (e) Special Management – Cases that do not fall into tracks (a) through (d) that are commonly referred to as complex and that need special or intense management by the court. (See reverse side of this form for a detailed explanation of special management cases.)
- (f) Standard Management - Cases that do not fall into any one of the other tracks

3/12/2007 <b>Date</b>	Lynn E. Rzonca <b>Attorney-at-law</b>	Graco Children's Products, Inc. <b>Attorney for</b>
215-864-8109 <b>Telephone</b>	215-864-9278 <b>FAX Number</b>	rzoncal@ballardspahr.com <b>E-Mail Address</b>

UNITED STATES DISTRICT COURT

FOR THE EASTERN DISTRICT OF PENNSYLVANIA - DESIGNATION FORM to be used by counsel to indicate the category of the case for the purpose of assignment to appropriate calendar.

Address of Plaintiff: 150 Oaklands Boulevard, Exton, PA 19341

Address of Defendant: 1835 Freedom Road, Lancaster, PA 17601

Place of Accident, incident or Transaction: \_\_\_\_\_  
*(Use Reverse Side For Additional Space)*

Does this civil action involve a nongovernmental corporate party with any parent corporation and any publicly held corporation owning 10% or more of its stock?  
 (Attach two copies of the Disclosure Statement Form in accordance with Fed.R.Civ.P. 7.1(a)) Yes  No

Does this case involve multidistrict litigation possibilities? Yes  No

RELATED CASE IF ANY

Case Number: \_\_\_\_\_ Judge \_\_\_\_\_ Date Terminated: \_\_\_\_\_

Civil cases are deemed related when yes is answered to any of the following questions:

1. Is this case related to property included in an earlier numbered suit pending or within one year previously terminated action in this court? Yes  No
2. Does this case involve the same issue of fact or grow out of the same transaction as a prior suit pending or within one year previously terminated action in this court? Yes  No
3. Does this case involve the validity or infringement of a patent already in suit or any earlier numbered case pending or within one year previously terminated action in this court? Yes  No

CIVIL: (Place  in ONE CATEGORY ONLY)

A. Federal Questions Cases:

1.  Indemnity Contract, Marine Contract, and All Other Contracts
2.  FELA
3.  Jones Act - Personal Injury
4.  Antitrust
5.  Patent
6.  Labor-Management Relations
7.  Civil Rights
8.  Habeas Corpus
9.  Securities Act(s) Cases
10.  Social Security Review Cases
11.  All other Federal Question Cases  
 (please specify) Telecommunications Act of 1996

B. Diversity Jurisdiction Cases:

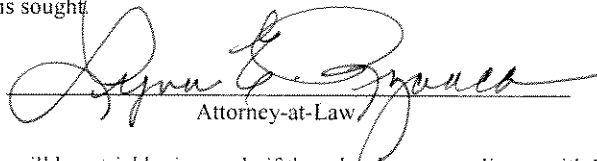
1.  Insurance Contract and Other Contracts
2.  Airplane Personal Injury
3.  Assault, Defamation
4.  Marine Personal Injury
5.  Motor Vehicle Personal Injury
6.  Other Personal Injury (Please specify)
7.  Products Liability
8.  Products Liability - Asbestos
9.  All other Diversity Cases (Please specify)

ARBITRATION CERTIFICATION

(Check appropriate category)

- I, Lynn E. Rzonca, counsel of record do hereby certify:
- Pursuant to Local Civil Rule 53.2, Section 3(c)(2), that, to the best of my knowledge and belief, the damages recoverable in this civil action case exceed the sum of \$150,000.00 exclusive of interest and costs;
- Relief other than monetary damages is sought

DATE: March 12, 2007

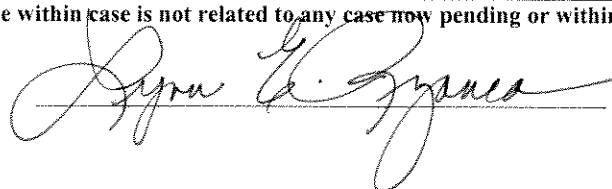
  
 Attorney-at-Law

86747  
 Attorney I.D. #

NOTE: A trial de novo will be a trial by jury only if there has been compliance with F.R.C.P. 38.

I certify that, to my knowledge, the within case is not related to any case now pending or within one year previously termination action in this court except as noted above.

DATE: March 12, 2007



86747

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

GRACO CHILDREN'S PRODUCTS, INC. : CIVIL ACTION  
 :  
v. :  
 :  
CHICCO USA, INC. :  
 :  
 : NO.

**DISCLOSURE STATEMENT FORM**

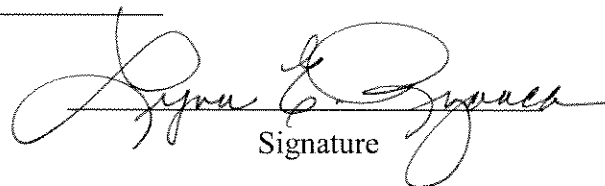
Please check one box:

The nongovernmental corporate party, \_\_\_\_\_, in the above listed civil action does not have any parent corporation and publicly held corporation that owns 10% or more of its stock.

The nongovernmental corporate party, Graco Children's Products, Inc., in the above listed civil action has the following parent corporation(s) and publicly held corporation(s) that owns 10% or more of its stock:

Newell Rubbermaid Inc. (Parent Corporation)  
\_\_\_\_\_  
\_\_\_\_\_

03/12/07  
Date

  
Signature

Counsel for: Graco Children's Products, Inc.

**Federal Rule of Civil Procedure 7.1 Disclosure Statement**

(a) WHO MUST FILE: NONGOVERNMENTAL PARTY. A nongovernmental corporate party to an action or proceeding in a district court must file two copies of a statement that identifies any parent corporation and any publicly held corporation that owns 10% or more of its stock or states that there is no such corporation.

(b) TIME FOR FILING; SUPPLEMENTAL FILING. A party must:

- (1) file the Rule 7.1(a) statement within its first appearance, pleading, petition, motion, response, or other request addressed to the court, and
- (2) promptly file a supplemental statement upon any change in the information that the statement requires.

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

GRACO CHILDREN'S PRODUCTS, INC. : CIVIL ACTION  
 :  
 v. :  
 :  
 CHICCO USA, INC. :  
 :  
 : NO.

**DISCLOSURE STATEMENT FORM**

Please check one box:

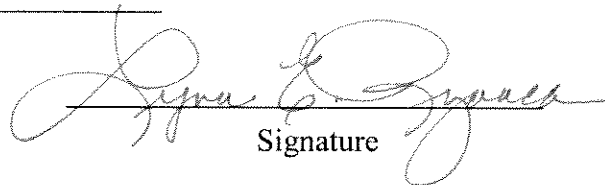
The nongovernmental corporate party, \_\_\_\_\_, in the above listed civil action does not have any parent corporation and publicly held corporation that owns 10% or more of its stock.

The nongovernmental corporate party, Graco Children's Products, Inc., in the above listed civil action has the following parent corporation(s) and publicly held corporation(s) that owns 10% or more of its stock:

Newell Rubbermaid Inc. (Parent Corporation)

03/12/07

Date

  
Signature

Counsel for: Graco Children's Products, Inc.

**Federal Rule of Civil Procedure 7.1 Disclosure Statement**

(a) WHO MUST FILE: NONGOVERNMENTAL PARTY. A nongovernmental corporate party to an action or proceeding in a district court must file two copies of a statement that identifies any parent corporation and any publicly held corporation that owns 10% or more of its stock or states that there is no such corporation.

(b) TIME FOR FILING; SUPPLEMENTAL FILING. A party must:

- (1) file the Rule 7.1(a) statement within its first appearance, pleading, petition, motion, response, or other request addressed to the court, and
- (2) promptly file a supplemental statement upon any change in the information that the statement requires.

IN THE UNITED STATES DISTRICT COURT FOR THE  
EASTERN DISTRICT OF PENNSYLVANIA

GRACO CHILDREN'S PRODUCTS, INC.,	)	
	)	
Plaintiff,	)	
	)	Civil Action
v.	)	No. _____
	)	
CHICCO USA, INC.,	)	JURY TRIAL DEMANDED
	)	
Defendant.	)	

**COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff Graco Children's Products, Inc. ("Graco") complains of Defendant Chicco USA, Inc. ("Chicco") as follows:

**Nature of the Action**

1. This is an action for injunctive relief and damages arising out of Defendant Chicco's infringement of a United States patent owned by Graco.

**Jurisdiction and Venue**

2. This action arises under the patent laws of the United States, 35 U.S.C. § 101, *et seq.* This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 (federal question jurisdiction) and 1338(a) (original jurisdiction under patent laws). Venue lies in the Eastern District of Pennsylvania under 28 U.S.C. §§ 1391 and 1400.

**The Parties**

3. Graco is a Delaware corporation with a place of business in Exton, Pennsylvania. Graco is a leading manufacturer of juvenile products, including children's strollers.

4. On information and belief, Chicco is a New Jersey corporation with its principal

place of business in Lancaster, Pennsylvania. Chicco sells juvenile products, including children's strollers, to retailers and consumers throughout the United States, including, on information and belief, to retailers and consumers in this District.

**Chicco's Acts of Infringement**

5. On November 12, 2002, the United States Patent and Trademark Office issued United States Patent No. 6,478,327 entitled "Foldable Stroller" ("the '327 Patent") to Graco. A copy of the '327 Patent is attached hereto as Exhibit A.

6. At all times relevant hereto, Graco has owned all right, title, and interest in the '327 Patent.

7. Chicco makes, uses, sells, offers for sale and/or imports strollers, including the "Cortina Stroller" and the "Cortina Travel System," that infringe one or more claims of the '327 Patent.

8. On information and belief, Chicco sells and/or offers for sale strollers, including the Cortina Stroller and the Cortina Travel System, in this District.

**COUNT I—PATENT INFRINGEMENT**  
**The '327 Patent**

9. Graco incorporates by reference each of the allegations of the foregoing paragraphs as if fully set forth herein.

10. Chicco makes, uses, sells, offers for sale and/or imports strollers, including the Cortina Stroller and the Cortina Travel System, that infringe one or more claims of the '327 Patent.

11. At all times relevant hereto, Chicco has had full knowledge of the '327 Patent, and Chicco's manufacture, use, sale, offer for sale, and/or importing of strollers, including the Cortina Stroller and the Cortina Travel System, constitutes willful, deliberate infringing activity.

12. Graco has been injured by Chicco's infringement of the '327 Patent.

13. Graco will continue to be injured by Chicco's infringement of the '327 Patent unless the Court enjoins Chicco from further infringement.

14. Chicco's infringement has caused and will continue to cause Graco irreparable harm for which there is no adequate remedy at law.

**PRAYER FOR RELIEF**

WHEREFORE, Graco prays that this Honorable Court:

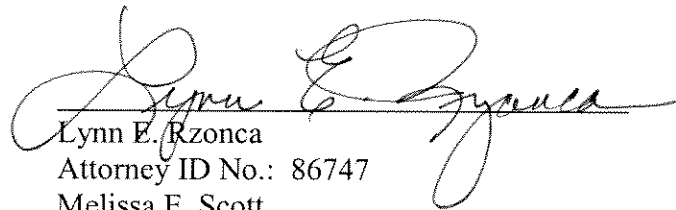
- (a) Enter judgment against Chicco for infringement of the '327 Patent;
- (b) Issue an Order permanently enjoining Chicco, its officers, agents, servants, employees, attorneys, and all those persons in active concert or participation therewith, from making, using, selling, offering for sale, and/or importing certain juvenile products, including the Cortina Stroller and the Cortina Travel System, or otherwise directly or indirectly infringing the '327 Patent;
- (c) Award Graco damages adequate to compensate Graco for Chicco's infringement, together with interest and costs as affixed by the Court; and
- (d) Grant Graco such further relief as this Court deems just under the circumstances.



**DEMAND FOR JURY TRIAL**

Graco respectfully demands trial by jury of all issues properly so triable under applicable law.

Date: March 12, 2007



Lynn E. Rzonca

Attorney ID No.: 86747

Melissa E. Scott

Attorney ID No.: 93420

Ballard Spahr Andrews & Ingersoll, LLP

1735 Market Street, 51<sup>st</sup> Floor

Philadelphia, PA 19103

Phone: (215) 665-8500

Facsimile: (215) 864-8999

*Attorneys for Plaintiff*

**EXHIBIT A**



US006478327B1

(12) **United States Patent**  
**Hartenstine et al.**

(10) **Patent No.:** US 6,478,327 B1  
 (45) **Date of Patent:** Nov. 12, 2002

- (54) **FOLDABLE STROLLER**
- (75) **Inventors:** Curtis M. Hartenstine, Birdsboro, PA (US); Robert T. Pike, West Lawn, PA (US)
- (73) **Assignee:** Graco Children's Products Inc., Exton, PA (US)
- (\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

4,111,454 A	9/1978	Kassai
4,126,331 A	11/1978	Sloan et al.
4,191,397 A	3/1980	Kassai
4,232,897 A	11/1980	Maclaren et al.
4,248,443 A	2/1981	Ohlson
4,317,581 A	3/1982	Kassai
4,335,900 A	6/1982	Fleischer
4,362,315 A	12/1982	Kassai
4,412,688 A	11/1983	Giordani
4,415,180 A	11/1983	Payne, Jr.
4,542,915 A	9/1985	Wheeler, III et al.

(List continued on next page.)

- (21) **Appl. No.:** 09/567,096
- (22) **Filed:** May 8, 2000
- (51) **Int. Cl.<sup>7</sup>** ..... B62B 7/04
- (52) **U.S. Cl.** ..... 280/642; 280/650; 280/47.38; 297/256.16
- (58) **Field of Search** ..... 280/642, 647, 280/650, 47.38, 644, 47.4; 297/250.1, 256.15, 256.16, 252

**FOREIGN PATENT DOCUMENTS**

DE	198 33 857 A1	2/1999
DE	299 10 986 U1	10/1999
EP	0 901 953 A2	3/1999
EP	0 994 004 A2	4/2000
WO	WO 00/06437	2/2000

*Primary Examiner*—Michael Mar

(74) *Attorney, Agent, or Firm*—Foley & Lardner

(56) **References Cited**

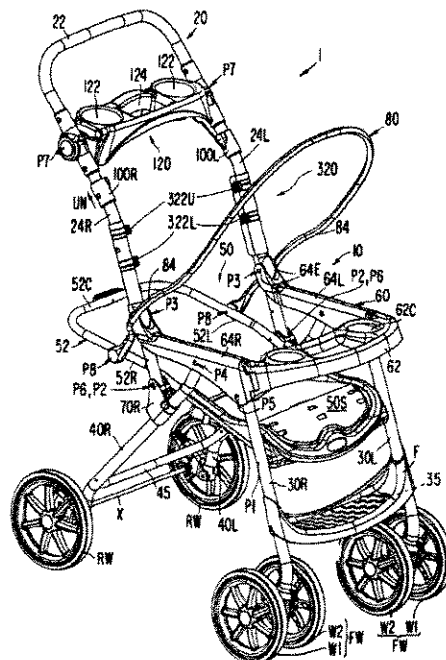
**U.S. PATENT DOCUMENTS**

2,616,719 A	11/1952	Heideman
2,783,053 A	2/1957	Sheldrick et al.
3,112,042 A	11/1963	Leshner
3,168,330 A	2/1965	Smith et al.
3,459,435 A	8/1969	Garner
3,504,926 A	4/1970	Glaser
3,556,546 A	1/1971	Garner
4,023,825 A	5/1977	Kassai
4,046,401 A	9/1977	Kassai

(57) **ABSTRACT**

A stroller has a retractable canopy frame, which can be accomplished by mounting the canopy frame to a seat support frame extending rearwardly beyond the pivoting connection to the stroller rear legs. The stroller also has a remote hinge-lock actuator incorporated into an upper tray connected between the push arm portion of the stroller frame. The stroller also has an infant carrier securing mechanism that allows the infant car carrier to be attached to the stroller and provide at least two tilt positions.

**30 Claims, 7 Drawing Sheets**



## US 6,478,327 B1

Page 2

## U.S. PATENT DOCUMENTS

4,564,212 A	1/1986	Orlandino et al.	5,388,852 A	2/1995	Bigo et al.
4,606,550 A	8/1986	Cone	5,417,450 A	5/1995	Wang
4,610,460 A	9/1986	Kassai	5,427,402 A	6/1995	Huang
4,632,420 A	12/1986	Miyagi	5,454,584 A	10/1995	Haut et al.
4,632,421 A	12/1986	Shamie	5,460,398 A	10/1995	Huang
4,660,850 A	4/1987	Nakao et al.	5,472,224 A	12/1995	Cabagnero
4,706,986 A	11/1987	Nakao et al.	5,478,102 A	12/1995	Huang
4,741,056 A	5/1988	Kassai	5,511,441 A	4/1996	Arai
4,741,551 A	5/1988	Perego	5,524,503 A	6/1996	Ishikura
4,763,911 A	8/1988	Gebhard et al.	5,605,409 A	2/1997	Haut et al.
4,763,919 A	8/1988	Nakao et al.	5,622,377 A	4/1997	Shamie
4,768,795 A	9/1988	Mar	5,645,293 A	7/1997	Cheng
4,770,437 A	9/1988	Glaser	5,664,795 A	9/1997	Huang
4,817,982 A	4/1989	Kassai	5,669,623 A	9/1997	Onishi
4,819,958 A	4/1989	Perego	5,676,386 A	10/1997	Huang
4,832,361 A	5/1989	Nakao et al.	5,718,444 A	2/1998	Huang
4,856,809 A	8/1989	Kohus et al.	5,722,682 A	3/1998	Wang
4,886,289 A	12/1989	Yee et al.	5,727,798 A	3/1998	Walters et al.
4,892,327 A	1/1990	Cabagnero	5,765,855 A	6/1998	Chiu
4,907,818 A	3/1990	Chai	5,765,856 A	6/1998	Kiser
4,924,725 A	5/1990	Takahashi et al.	5,769,447 A	6/1998	Huang
4,930,697 A	6/1990	Takahashi et al.	5,775,718 A	7/1998	Huang
4,953,887 A	9/1990	Takahashi et al.	5,845,666 A	12/1998	Messner
5,056,805 A	10/1991	Wang	5,845,924 A	* 12/1998	Huang ..... 280/642
5,074,575 A	12/1991	Bigo	5,876,057 A	* 3/1999	Huang ..... 280/642
5,087,066 A	2/1992	Mong-Hsing	5,887,935 A	3/1999	Sack
5,110,150 A	5/1992	Chen	5,938,229 A	* 8/1999	Chen et al. .... 280/642
5,143,398 A	9/1992	Teng	5,947,555 A	* 9/1999	Welsh, Jr. et al. .... 280/30 X
5,181,735 A	1/1993	Onishi	5,979,928 A	* 11/1999	Kuo ..... 280/642
5,184,835 A	2/1993	Huang	5,988,669 A	* 11/1999	Freese et al. .... 280/642
5,201,535 A	4/1993	Kato et al.	6,070,890 A	6/2000	Haut et al.
5,205,577 A	4/1993	Liu	6,116,624 A	* 9/2000	Hu ..... 280/642
5,244,228 A	9/1993	Chiu	6,139,046 A	* 10/2000	Aalund et al. .... 280/642
5,246,272 A	9/1993	Kato et al.	6,155,740 A	12/2000	Hartenstine
5,257,799 A	11/1993	Cone et al.	6,273,451 B1	8/2001	Julien et al.
5,362,089 A	11/1994	Jyan-Tsai			

\* cited by examiner

FIG. 1

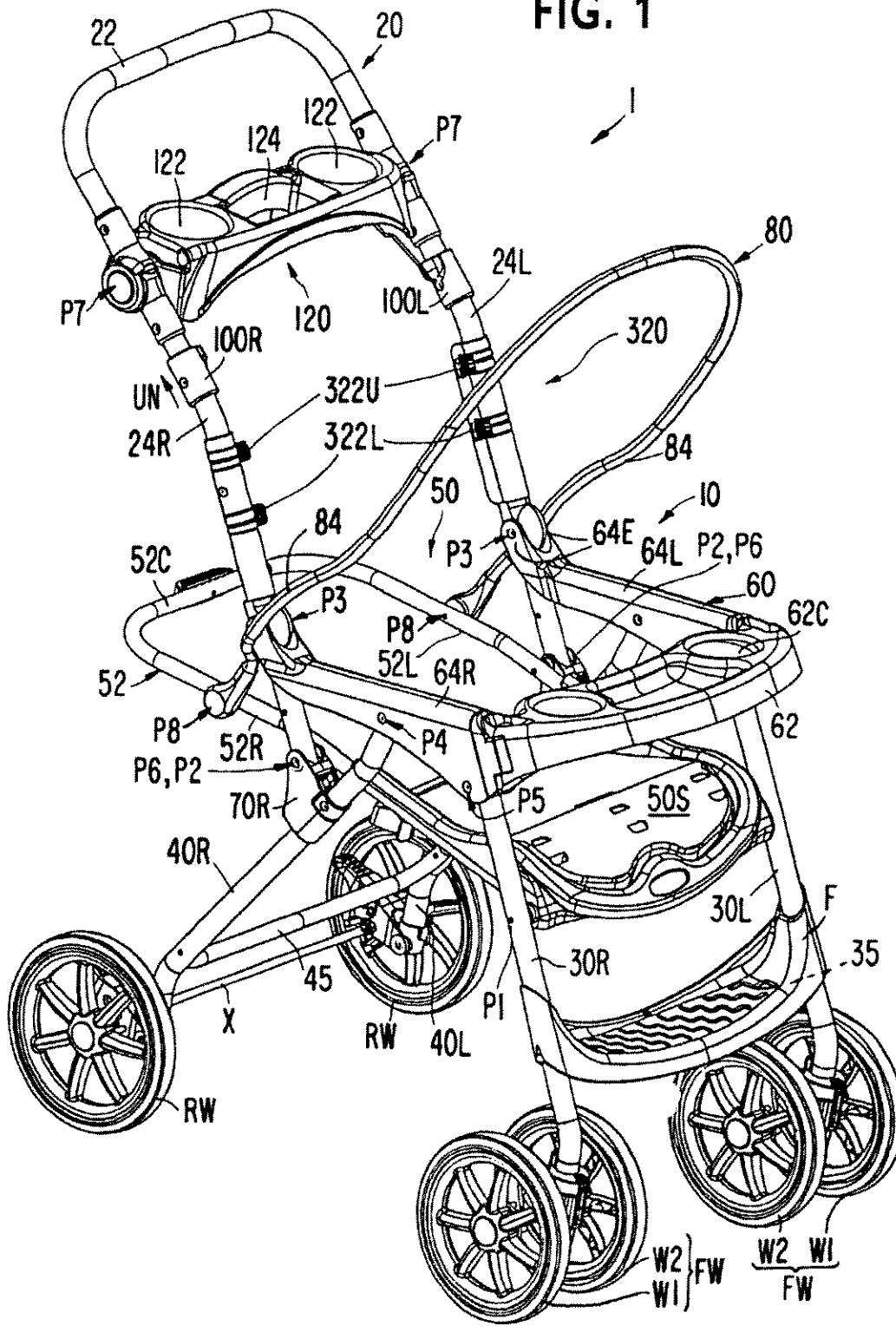


FIG. 1A

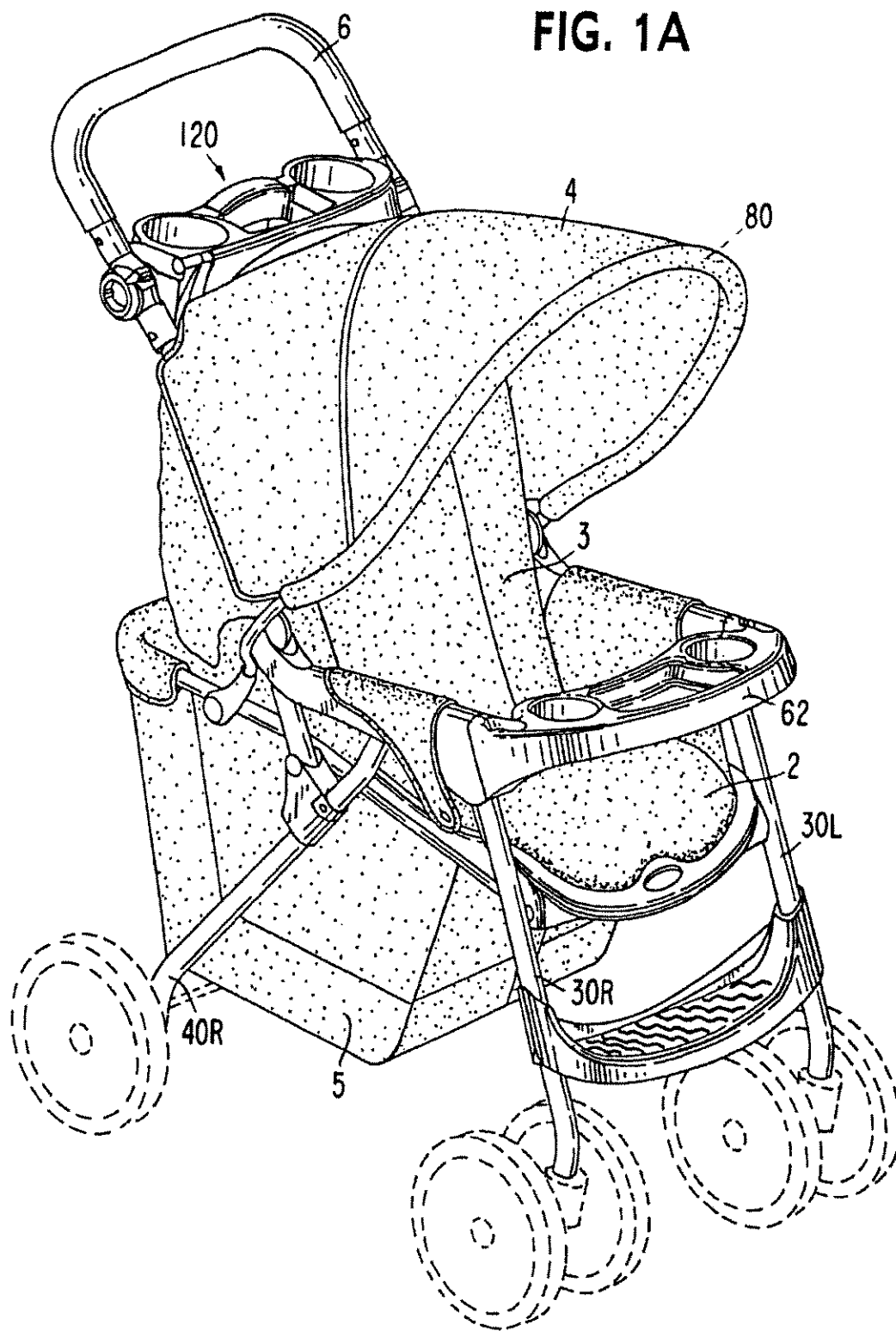


FIG. 2

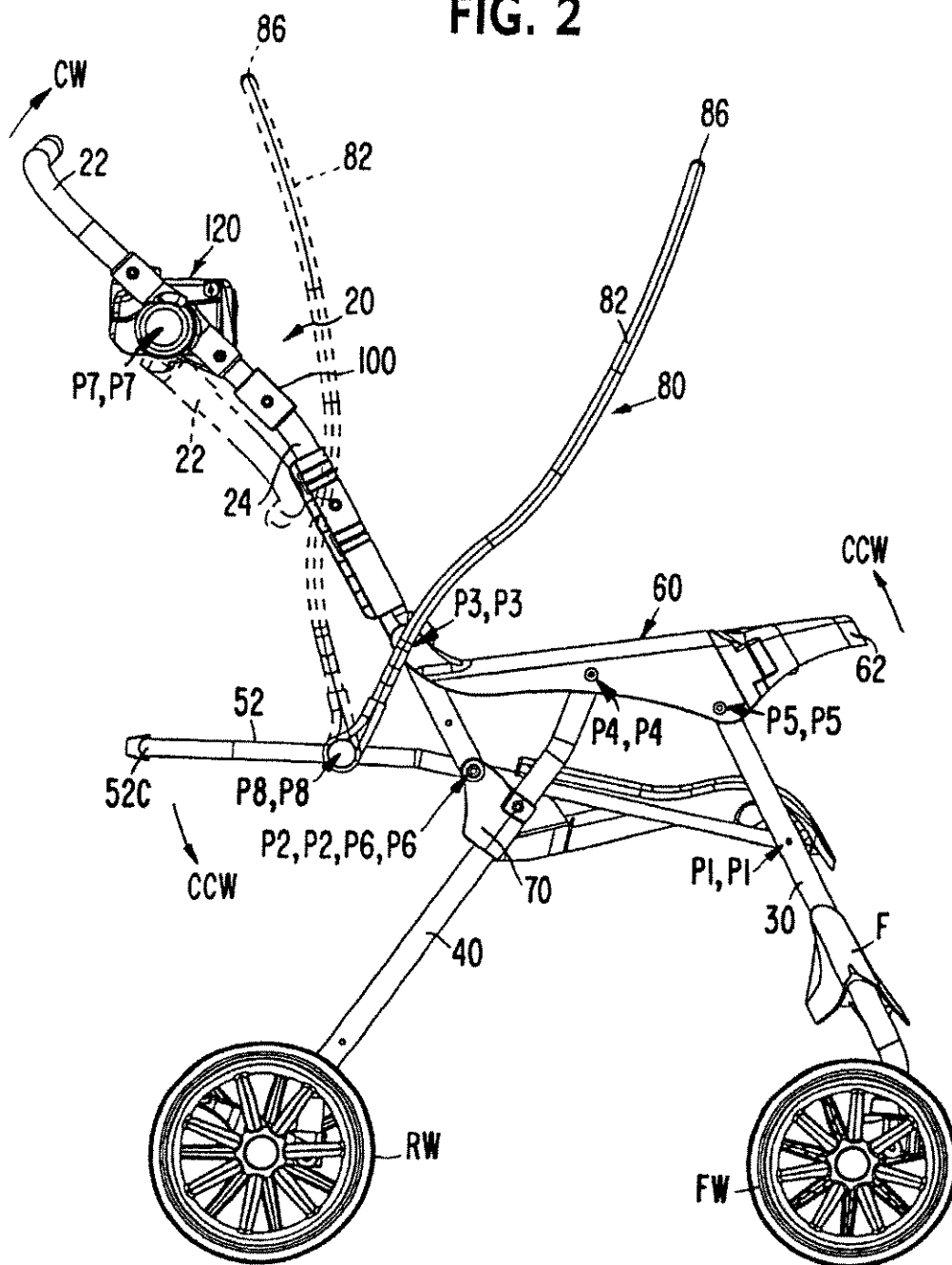


FIG. 3

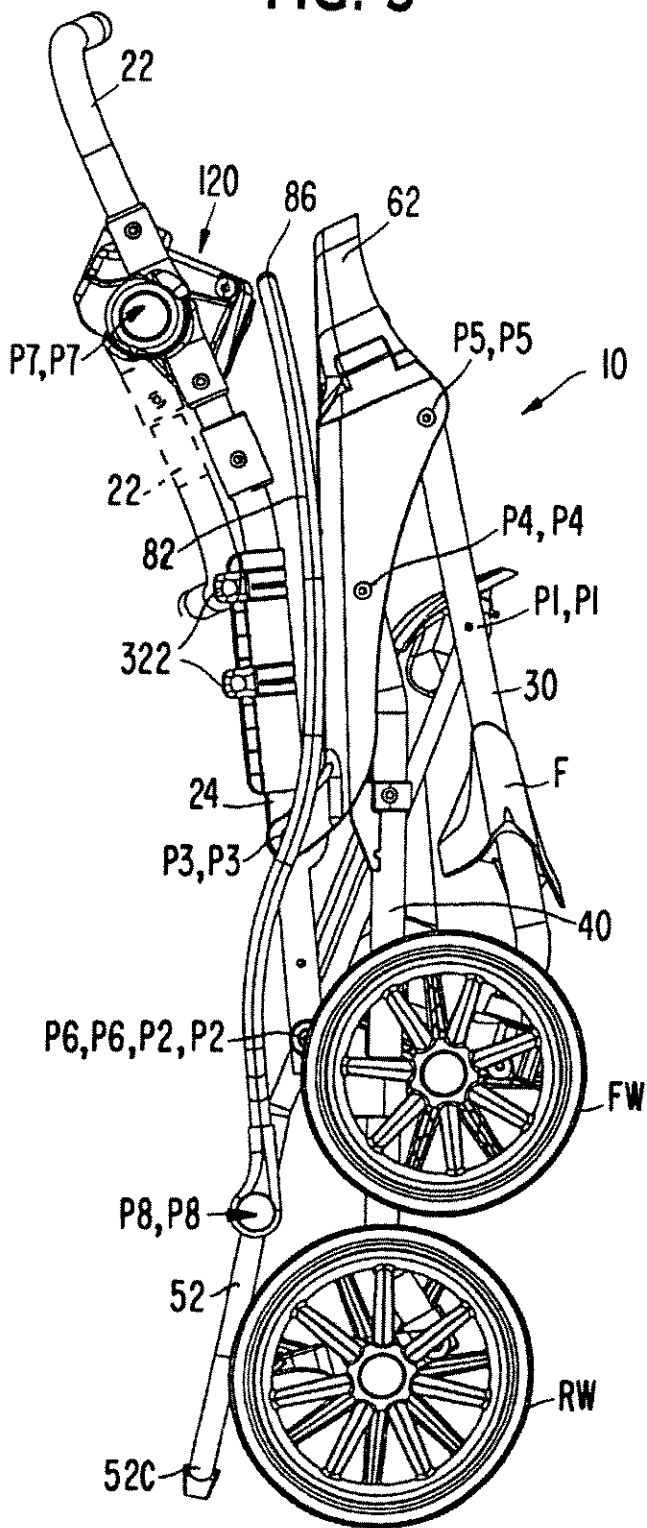




FIG. 4

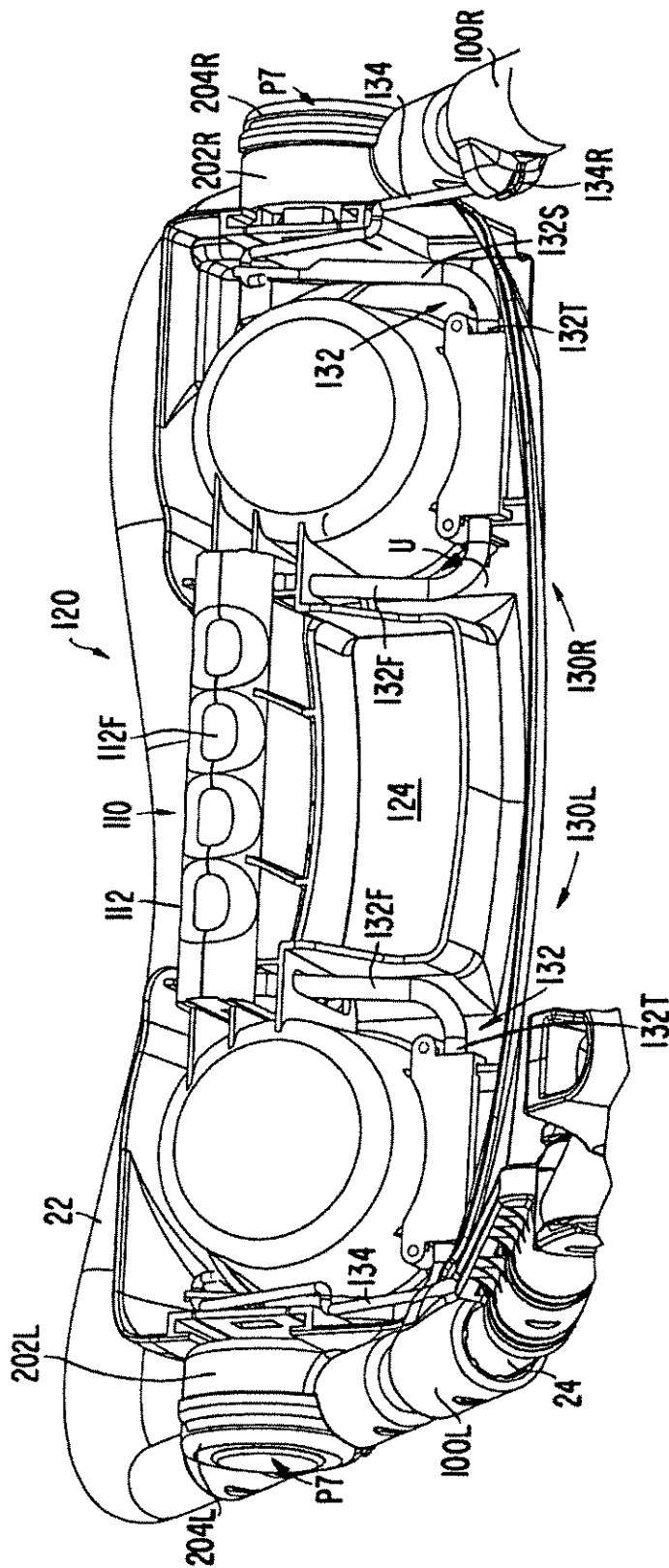


FIG. 5

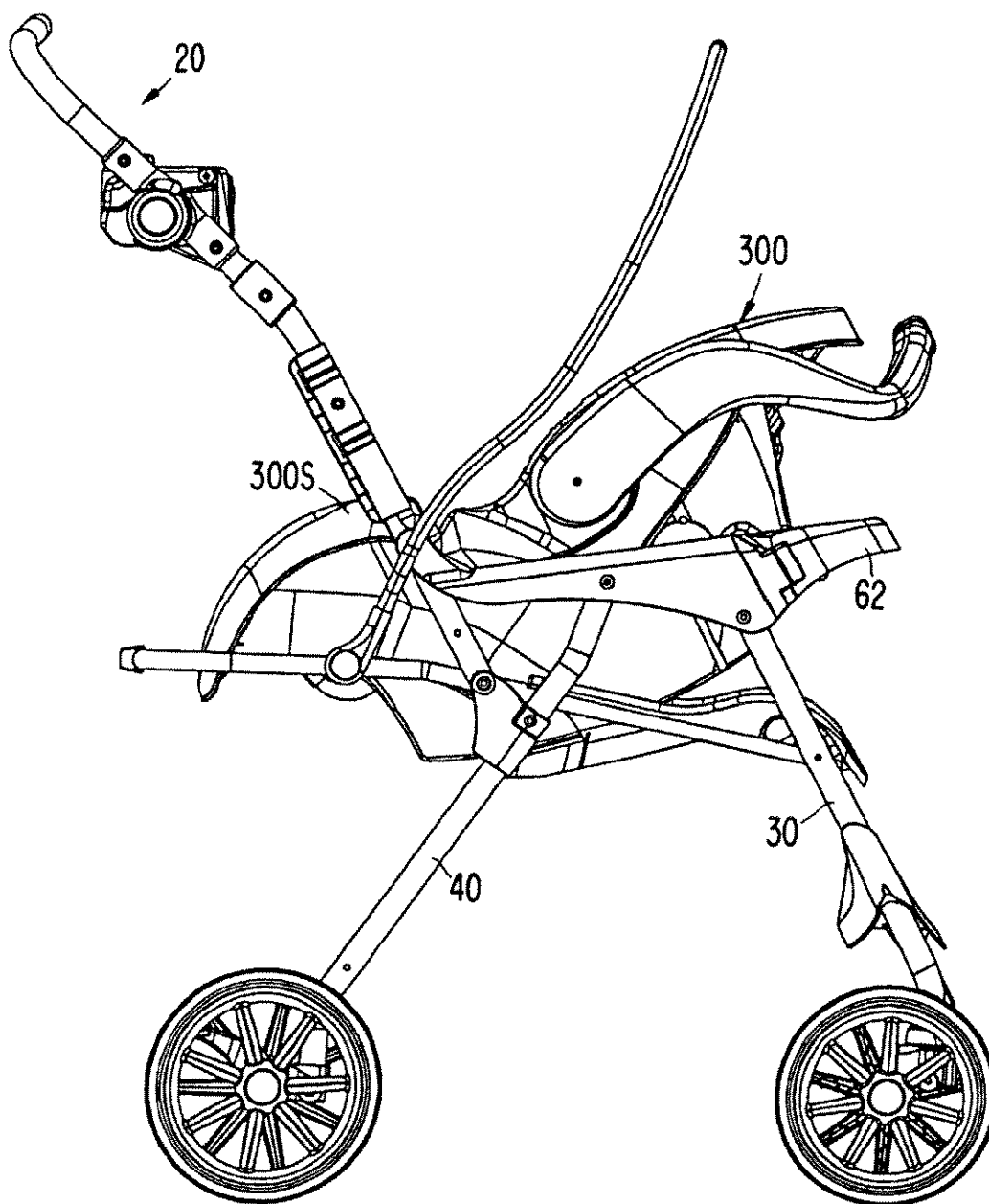
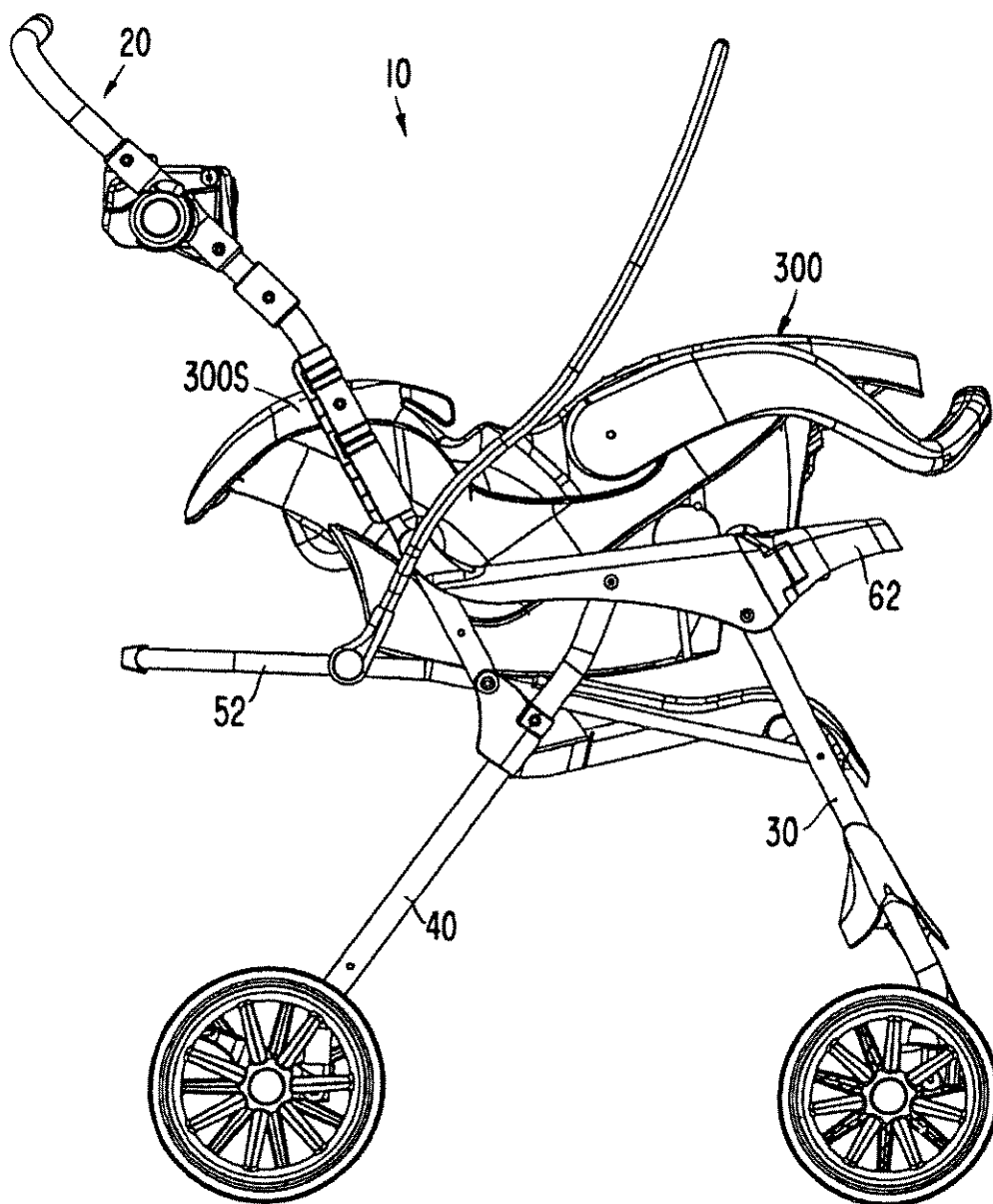


FIG. 6



US 6,478,327 B1

# 1

## FOLDABLE STROLLER

### BACKGROUND

Foldable strollers, such as disclosed in U.S. Pat. No. 5,511,441 issued to Arai; U.S. Pat. No. 5,181,735 issued to Onishi; U.S. Pat. No. 4,953,887 issued to Takahashi, et al.; and U.S. Pat. No. 6,155,740 issued to Hartenstine, have an articulated stroller frame that allows the stroller to fold from its use configuration to its collapsed configuration. These strollers include soft goods made of fabric, such as a seat, back support, canopy, storage basket, etc., covering parts of the stroller frame. The back support can be movably configured between a sitting position and a recumbent or lying position. These strollers also have left- and right-side hinge locks, between the respective left- and right-side push arms of the handlebar frame and the left- and right-side rear legs, to maintain the stroller in the operating configuration.

In such strollers, and other foldable strollers, the canopy frame or bow is typically attached to the push arms or the hinge locks. Consequently, the position of the canopy frame, relative to the push arms, remains fixed at all times, between its open position and its closed position. When the stroller is folded, the canopy frame is at its closed position. But since the canopy frame position is fixed relative to the push arms, if a relatively large canopy is used, the canopy frame can protrude beyond the handlebar. Particularly since a larger canopy is desirable to protect infants from exposure to sunlight, the stroller can become bulkier. Accordingly, there is a need for a stroller that can be made more compact, particularly with the use of a larger canopy.

Further, it is desirable for the stroller to have ergonomically correct handlebar, which typically is the cross bar member extending across the push arms, for comfort and control. For added comfort to the caretaker, the handlebar angle can be adjusted relative to the push arms, as disclosed, for example in U.S. Pat. No. 5,184,835 issued to Huang and U.S. Pat. No. 5,056,805 issued to Wang. Including such an adjustable handlebar, however, makes it more difficult to provide a remote hinge-lock actuator on the handlebar, which typically needs a Bowden cable or similar arrangements to allow for the handlebar to rotate without actuating the hinge locks. In this respect, U.S. Pat. No. 5,775,718 discloses a simple, cable operated remote hinge-lock actuator positioned adjacent to the handlebar. It would be desirable to incorporate a simple cable-operated remote hinge-lock actuator into the existing structure.

Moreover, it would be desirable for the stroller to carry an infant car carrier. While many different configurations for that purpose have been contemplated, there still remains a need for a stroller that is configured to secure an infant car carrier in two or more reclined or tilted positions.

The present invention addresses these needs.

### SUMMARY

The present invention is drawn to a stroller. According to one aspect of the present invention, the stroller can have a retractable canopy, which can be accomplished by mounting the canopy frame to a seat support frame or basket frame extending rearwardly beyond the pivoting connection to the

# 2

stroller rear legs. According to another aspect of the present invention, the stroller can have a remote hinge-lock actuator incorporated into an upper or parent tray formed between its push bar arms. According to another aspect of the present invention, the stroller can have an infant carrier securing mechanism that allows the infant car carrier to be attached to the stroller and provide at least two tilt positions.

A foldable stroller can comprise a foldable stroller frame convertible between an operating position and a folded position. The stroller frame can have front left, front right, rear left, and rear right legs, a handlebar frame pivotally connected to the rear left and right legs, and a seat support frame pivotally connected to the front left and right legs and rear left and right legs. The seat support frame has a portion that pivots downwardly when the frame is folded.

The stroller frame can further include left and right hinge locks fixedly mounted respectively to the rear left and right legs. The ends of the handlebar frame can be pivotally connected to the left and right hinge locks.

The stroller frame can further include a tray assembly comprising a front tray and left and right side arms connected to the front tray. The left and right side arms can be pivotally connected to the handlebar frame. The front and rear left and right legs can be pivotally connected to the left side arm, and the front and rear right legs can be pivotally connected to the right side arm.

The seat support frame can comprise a cross arm and left and right arms extending from the cross arm. The left arm is pivotally connected to the front left leg and the left hinge lock and the right arm is pivotally connected to the front right leg and the right hinge lock.

The push arms can be pivotally connected to the hinge locks. The left push arm and the left arms can be pivotally connected to the left hinge lock about a common axis, and the right push arm and the right arm are pivotally connected to the right hinge lock about a common axis. The left and right arms can extend rearwardly beyond the common axes of the left and right hinge locks. The portion of the seat support frame that pivots downwardly when the frame is folded can include the left and right arms extending beyond the common axes. The cross arm can connect the ends of left and right arms extending beyond the common axes.

The handlebar frame can comprise a handlebar and left and right push arms connected to the handle bar. Specifically, the handlebar can be pivotally connected to the left and right push arms respectively about left and right pivot assemblies. The handlebar can be pivotally movable to reduce the length of the handlebar frame during storage.

According to one aspect of the present invention, a canopy frame can be connected to the portion of the seat support frame that pivots downwardly so that as the stroller frame is folded, the portion of the seat support frame pivoting downwardly pulls the canopy frame downwardly. Specifically, the canopy frame can be pivotally connected to the left and right arms extending beyond the common axes. A portion of the canopy spaced furthest from the pivotal connection to the seat support frame can be positioned below the front tray, and can be positioned between the handlebar frame and the tray when the stroller is folded.

According to another aspect of the invention, the stroller or the stroller frame can include an upper tray mounted to

US 6,478,327 B1

3

the handlebar frame and a one-hand actuator for unlocking the left and right hinge locks mounted to the upper tray. The upper tray can have at least one container holding compartment and an opening for inserting operator's fingers. The actuator can be mounted to the underside of the upper tray for a movement between a pushed, actuated position and un-actuated position.

The stroller can further include left and right hinge-lock actuating members movably mounted to the left and right push arms and operatively connected respectively to the left and right hinge locks. The actuator can comprise a handle and left and right linkage assemblies connecting the handle to the left and right actuating members. Each of the left and right linkage assemblies can comprise a substantially U-shaped cross linkage and a push rod connected to the cross linkage. The cross linkage can have first, second, and third arms. The third arm can be pivotally journaled to the underside of the upper tray and join the first and second arms. The first arm can connect to one side of the handle and the second arm can pivotally connect to the push rod, which can connect to the respective left or right actuating member.

According to another aspect of the invention, the stroller can include an infant carrier securing mechanism connected to the handlebar frame, or alternatively, means for mounting an infant carrier in a rearwardly facing direction and providing at least two recline positions. The securing mechanism is adapted to engage front portions of the infant carrier to provide the two recline positions.

The securing mechanism can comprise a plurality of stops movably mounted to the left and right push arms. Each stop can be rotatably mounted between an engage position and a disengage position, which is rotated away from the engage position. There can be a pair of lower stops and a pair of upper stops, respectively mounted rotatably to the left and right push arms. The infant carrier can be adapted to engage the lower stops to provide a first recline position for the infant carrier and can be adapted to engage the upper stops and the lower stops to provide a second recline position, which can be more reclined than the first position.

Another aspect of the invention resides in a method of retracting a canopy of a stroller when it is folded, comprising providing a foldable stroller of the type described above and mounting a canopy frame to the portion of the seat support frame that pivots downwardly so that, as the stroller frame is being folded, the seat support frame pivoting downwardly pulls down the canopy frame.

#### BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present invention will become more apparent from the following description, appended claims, and accompanying exemplary embodiments shown in the drawings, which are briefly described below.

FIG. 1 is a perspective view of a foldable stroller in its operating position, with the soft goods removed to reveal a stroller frame.

FIG. 1A is a perspective view of a foldable stroller of FIG. 1 with the soft goods in place.

FIG. 2 is a side view of the foldable stroller of FIG. 1.

FIG. 3 is a side view of the foldable stroller of FIG. 1 in the folded position.

4

FIG. 4 is a detailed perspective view of a parent tray and a remote hinge-lock actuator.

FIG. 5 is a side view of the foldable stroller of FIG. 1, with an infant car carrier mounted thereto and positioned at an infant upright position.

FIG. 6 is a side view of the foldable stroller of FIG. 1, with the infant carrier mounted thereto and positioned at an infant reclined position.

#### DETAILED DESCRIPTION

Although references are made here to directions in describing the structure, they are made relative to the drawings (as normally viewed) for convenience. The directions, such as left, right, upper, lower, inward, outward, etc., are not intended to be taken literally or limit the present invention in any form. Moreover, the numerical nomenclatures, first, second, third, fourth, etc., are used solely for purposes of tracking the structural elements. These numerical nomenclatures are not intended to be taken literally or to limit their associated elements.

FIG. 1 shows the perspective view of the foldable stroller 1 according to one embodiment of the present invention. To more clearly reveal the stroller frame 10, the stroller 1 (in FIGS. 1 and 2-6) is shown without the associated "soft goods," such as seat cushion 2, seat back support 3, canopy 4, basket 5, hand grip 6, etc., which are typically made of cloth or plastic or both, or a flexible material. The stroller 1 with the soft goods in place is shown in FIG. 1A. The stroller 1 is generally intended for transporting children, but the inventive principles can be applied to all types of wheeled transports, including carts or carriages having a foldable frame.

The stroller 1 includes a stroller frame 10 that is convertible between an operating or use position (shown in FIGS. 1, 1A, and 2), and a folded or stowed position (shown in FIG. 3). In the folded position, the stroller 1 is folded to a generally flattened configuration for storage. In the operating position, the stroller 1 is configured to receive and transport a passenger in a manner well understood by those skilled in the art.

Referring to FIGS. 1 and 2, the stroller frame 10 can have the basic fundamental frame configuration, similar to the ones identified previously in U.S. Pat. Nos. 6,155,740; 5,511,441; 5,181,735; and 4,953,887, the disclosures of which are incorporated herein by reference. The stroller frame 10 according to the present invention includes a handlebar frame 20, legs 30R, 30L, 40R, 40L, a passenger support or frame 50, a tray assembly 60, and a pair of hinge locks 70. In the drawings, a letter "P" or "Px" (where x represents a number) designates a pivotal connection, a pivot, or pivotal mount, or any conventional pivoting configuration, which can include pins, shaft, bolt, rivet, bearings, etc.

The handlebar frame 20 comprises a handlebar 22 and right and left push arms 24R, 24L (collectively 24) extending from the handlebar 22. The handlebar 22 and the push arms 24 form a generally U-shaped frame. The handlebar 22 can be ergonomically configured for comfort, such as described in U.S. Pat. Nos. 5,454,584 and 5,605,409 issued to Haut, et al., the disclosures of which are incorporated herein by reference. The handlebar frame 20 can include an

US 6,478,327 B1

5

angle adjuster **200** for pivotally positioning the handlebar **22** relative to the push arms **24**. The inner operative workings of the angle adjuster is omitted for brevity, particularly since any known angle adjuster can be used, such as the ones disclosed in aforementioned U.S. Pat. No. 5,184,835 issued to Huang and U.S. Pat. No. 5,056,805 issued to Wang, the disclosures of which are incorporated herein by reference. In the present embodiment, the angle adjuster **200** is adapted to provide a greater rotation capability so that the handlebar can be flipped over close to the push arms **24**, as shown in phantom in FIG. 3.

The legs **30R, 30L, 40R, 40L** can be described in terms of front legs **30**, which include a front right (FR) leg **30R** and a front left (FL) leg **30L**, and rear legs **40**, which include a rear right (RR) leg **40R** and a rear left (RL) leg **40L**. Each leg **30R, 30L, 40R, 40L** has a lower end to which at least one rotatable wheel **W** is mounted. As shown, the front legs **30** each can have a pair of rotatable front wheels **W1, W2** (collectively **FW**). The rear legs **40** can be reinforced with a cross brace **45**, which extends between the rear wheels **RW**, above the rear wheel axle **X**. Similarly, the front legs **30** can be reinforced with a cross brace **35** (hidden inside the foot rest **F**) extending between the front wheels **W**.

The passenger support **50** includes a substantially U-shaped seat support frame **52**. A back support (not shown), which can comprise a soft good (fabric) or frame type with a reclining latch (not shown), can be connected to the seat support frame **52**. The seat support frame **52** has a cross arm **52C** joined to left and right arms **52L, 52R**. The seat support frame arms **52L, 52R** are pivotally mounted to the respective front legs **30L, 30R** at pivots **P1**, and are pivotally mounted to the hinge locks **70** at pivots **P2**, as better illustrated in FIG. 2. The hinge locks **70** are fixedly mounted to the rear legs **40**. Accordingly, the seat support frame arms **52L, 52R** are operatively connected pivotally to the rear legs **40**. The support **50** can further include a seat **50S** secured to the seat support frame arms **52L, 52R**.

A portion of the seat support frame **52** protrudes beyond the pivoting connection **P2** of the rear legs **40** (or the hinge locks) to the support frame arms **52L, 52R**, as shown in FIG. 2. A storage basket or the like (not shown) can hang from the seat support frame **52**, and hence sometimes referred to as a basket frame, for storing various sundry items, including diapers, bottles, blankets, bibs, and other child-related items.

The tray assembly **60**, which can have a U-shaped configuration as shown in FIG. 1, comprises a tray **62**, and left and right side arms **64L, 64R** (collectively **64**) pivotally connected respectively to the left and right push arms **24L, 24R** at pivots **P3**. Specifically, referring to FIG. 1, the distal (rear) end of each of the side arms **64** has a pair of spaced ears **64E** or the like that are spaced apart to receive the respective push arm **24L, 24R**, and are held pivotally together with pivots **P3**. The tray **62**, which can have one or more cup or container holding compartments **62C**, can be either fixedly formed with the side arms **64**, detachably mounted to the side arms **64**, such as disclosed in U.S. Pat. No. 4,856,809, the disclosure of which is incorporated herein by reference, or pivotally connected or hinged to one side of the side arms **64L, 64R**, while the opposite side can be latched to the other of the side arms **64L, 64R**. In the third option, the tray **62** can also be rotatably mounted to the one

6

side arms **64L, 64R**, thus creating two axes of rotation. The tray **62** can be opened (pivoted along one substantially extending axis) and rotated about a second axis to tuck the tray **62** alongside the respective front legs **30R, 30L**. Moreover, any conventional attaching means can be contemplated for detachably or movably attaching the tray **62** to the side arms **64**.

The front and rear legs **30, 40** are pivotally mounted to the tray assembly **60**. Specifically, the upper end of the front and rear legs **30, 40** are pivotally mounted to the respective side arms **64** with pivots **P4, P5**, respectively.

The hinge locks **70** (left **70L**, right **70R**) pivotally mount the handlebar frame **20** to the rear legs **40** at pivots **P6**. The hinge locks **70** can be any conventional hinge lock for maintaining a fixed position between the rear legs **40** and the handlebar frame **20** when locked, and for allowing pivotal motion therebetween when unlocked. For instance, the left and right hinge locks **70L, 70R** each can be fixedly attached to and positioned between the ends of the respective rear leg **40L, 40R**. The ends of the respective left- and right-side push arms **24** can be pivotally mounted to the respective hinge locks **70** at pivots **P6** (which can share common pivots with pivots **P2**). To lock the handlebar frame **20** to the rear legs **40**, each hinge lock **70** can include, for instance, a plunger or the like (not shown) that is movably mounted inside the handlebar frame **20**, or a latch (not shown) that is pivotally mounted to the handlebar frame **20**. The plunger can be biased inwardly into the respective hinge lock **70L, 70R** or the latch can be biased to hook onto a fixed portion of the respective hinge lock **70L, 70R** to lock the handlebar frame **20** to the rear legs **40**. Alternatively, the hinge lock **70** can be configured as disclosed in previously mentioned U.S. Pat. No. 6,155,740 issued to Hartenstine, or U.S. Pat. No. 5,110,150 issued to Chen, the disclosures of which are incorporated herein by reference.

A pair of remote actuating members **100L, 100R** (collectively **100**) or the like can be operatively connected to the hinge locks **70**, such as with a cable or rod (not shown). Each of the left and right actuating members **100L, 100R** are slidably mounted to the respective left and right push arms **24L, 24R**. Pulling each of the remote actuating members **100L, 100R** upwardly along the respective left and right push arms **24L, 24R** actuates the respective hinge lock **70L, 70R**, e.g., moves the plungers upwardly into the push arms **24** or disengage the latch.

To unlock the stroller frame **10** from the operating position to the folded position, the operator can slide both remote actuating members **100** along the push arms **24** in the direction of arrow **UN** (see FIG. 2), which unlocks the hinge locks **70**. Once the hinge locks **70** are unlocked, the stroller can be folded, for example, by pivoting the tray assembly **60** about the handlebar frame **20**, in the counterclockwise direction **CCW** (FIG. 2), which raises the tray **62** upwardly to the folded position (FIG. 3), while lowering the cross arm (distal end portion) **52C** of the seat support frame **52**.

#### Upper Tray/Hinge Lock Actuator

Referring to FIG. 4, the stroller also can include a one-hand hinge-lock actuator **110**, which is connected to the remote actuating members **100**. According to one aspect of

US 6,478,327 B1

7

the present invention, the hinge-lock actuator 110 can be formed with an upper tray 120, which is connected to the handlebar frame 20. The upper tray 120 comprises at least one recessed compartment, such as a cup or container holding recess 122. The illustrated embodiment shows two cup or container holding compartments 122 and a through-hole 124, which permits the operator's hand or fingers to be inserted therethrough.

The tray 120 can be mounted to the push arms 24 or to the angle adjuster 200 about pivots P7. Specifically, the angle adjuster 200 can have a fixed pivot member 202L, 202R (collectively 202) extending from each upper end of the left and right push arms 24L, 24R and a movable pivot member 204L, 204R (collectively 204) extending from each lower end of the handlebar 22. The fixed pivot members 202 are positioned facing each other, i.e., positioned inwardly of the respective movable pivot members 204. The fixed pivot members 202 can have tracks, sockets, or any mechanical connectors that can receive complementary mating parts formed on the left and right sides 120L, 120R of the tray 102.

The remote hinge-lock actuator 110 comprises a handle 112 and left and right linkage assemblies 130L, 130R (collectively 130). The handle 112 is mounted for a movement between an actuated or pushed position, which pulls up the actuating members 100 to release the hinge locks 70, and a non-actuated or locked position, where the actuating members 100 are at their normal, down position (hinge locks 70 remain locked). The handle 112 can be biased toward the non-actuated (locked) position, and can include finger contours 112F. Either hand of the operator can be inserted into the through-hole 124 so that the fingers loop around the finger contours 112F. To actuate or release the hinge locks 70, the operator presses or pulls up the handle 112 with his or her fingers.

Still referring to FIG. 4, the right and left linkage assemblies 130L, 130R are substantially identical, mirror images of each other. Each of the right and left linkage assemblies 130L, 130R comprises a cross linkage 132 connected to a push rod 134. The cross linkage 132 is substantially U-shaped, having a first arm 132F and a second arm 132S spaced from the first arm 132F and joined by a third arm 132T. The first arm 132F is connected to one side of the handle 112 and the second arm 132S is pivotally connected to the push rod 134. The third arm 132T is pivotally journaled to the underside of the tray 120. Actuating the handle 112 simultaneously rotates the left and right cross linkages 132 in the direction of the arrow U (pivots toward the upper side of the tray 120). One end of the push rod 134 is pivotally connected to the free end of the second arm 132S, and the other end is pivotally secured to the respective actuating members 100L, 100R. In this respect, each of the actuating members 100L, 100R has a push rod receptacle 134R configured to receive and hook (or latch) onto the respective push rod 134. As the operator pushes the handle 112, both the left and right cross linkages 132 rotate, which pull up the respective left and right push rods 134, and thus the actuating members 100L, 100R and allow the handlebar frame 20 to pivot relative to the hinge locks 70.

#### Canopy Frame

According to another aspect of the present invention, the stroller includes a canopy support rod or frame 80 attached

8

to the seat support frame or basket frame 52 at pivots P8. The frame 80 comprises one or more substantially U-shaped canopy bows 82 (only one shown) that support a canopy and pivotally or movably attached to the seat support frame 52. In this respect, any conventional bow mounting system can be used. The canopy frame 80 can be moved between a use position (solid in FIG. 2) for shading a passenger and a stow position (phantom in FIG. 2) where it is pulled close to the handlebar frame, away from the passenger. The canopy bow(s) 82 is pivotally attached at the pivots P8, which is located on the portion 52B of the seat support frame extending beyond the pivots P2, P6. In this respect, the canopy bow 82 can have outwardly extending bulge 84 to provide clearance for the push arms 24.

When the stroller is being folded from the operating position shown in FIG. 2 to the folded position shown in FIG. 3, the distal end (cross arm 52C) of the seat support frame 52 rotates counterclockwise CCW, toward the rear wheels RW, while the handlebar frame 20 rotates clockwise CW. This lowering action of the support frame 52 retracts the bow 82 downwardly and automatically positions the bow 82 close to the handlebar frame 20. It should be noted that the canopy 4 can be mounted around the handle frame 20. Thus, moving the handlebar frame 20 pivots the canopy frame 80 to the position shown in phantom when the stroller is folded. But because the canopy frame 80 is retracted when the stroller is fully folded (FIG. 3), the bow 82 is tucked in between the handlebar frame 20 and the tray assembly 60.

The area (crest) 86 of the bow furthest from the pivots P8 can be located higher than the handlebar 22, as shown in FIG. 2 when the stroller is in the operating position. Nonetheless, because of the present unique mounting of the canopy frame 80, the crest 86 of the bow can extend well below the handle bar 22, as shown in FIG. 3. In this respect, it is preferable for the crest 86 to be positioned inwardly from the front end of the tray to protect the canopy 4.

It is further desirable to make the stroller as compact as feasible when it is folded. According to the present invention, the handlebar 22 is made foldable about the pivots P8 as shown in phantom in FIG. 3. By pivoting the handlebar 22 in the counterclockwise direction, the handlebar 22 is no longer the highest or longest point of the folded stroller, and the overall length of the folded stroller can be considerably reduced.

#### Infant Carrier Mount

FIGS. 5 and 6 illustrate the present stroller 1 with an infant carrier 300 mounted thereto. According to another aspect of the invention, the stroller 1 provides at least two tilt positions, reclined and upright, while the infant carrier is rearwardly facing. In this respect, the infant carrier 300 can be mounted to the tray as described in U.S. Pat. No. 6,070,890, the disclosure of which is incorporated herein by reference. That is, the front tray 62 can have a notch or the like (not shown) that can latch onto a retractable catch or the like (not shown) formed on the underside of the infant carrier. The handlebar frame 20 carries infant carrier securing mechanism 320, which comprises a plurality of abutments or stops 322 (322U, 322L) rotatably mounted to the left and right push arms 24L, 24R. The stops 322 are rotatable between an engage position shown in FIG. 1 and

## US 6,478,327 B1

9

a disengage position rotated away from the engage position. The present embodiment has four stops, a pair of lower stops 322L and a pair of upper stops 322U.

Referring to FIG. 5, the carrier 300 is seated so that it is rearwardly facing (facing the caregiver) and is positioned in an upright position. In this position, the lower stops 322L are rotated to the engage position to abut the upper front left and right sides 300S of the infant carrier. The lower stops 322L are rotated toward each other after the infant carrier 300 is placed in position. In this position, the front part of the infant carrier 300 is supported by the seat support 50S (and the associated seat cushion 2 and the lower stops 322L) and the lower stops 322L confine the infant carrier from being lifted upwardly.

Referring to FIG. 6, to position the infant carrier in the more reclined position, the lower stops 322L are rotated so that they face each other, as shown in FIG. 1. The infant carrier 300 rests on the front tray 62 and the lower stops 322L. Once the infant carrier 300 is positioned, the upper stops 322U are rotated so that they abut against the upper surface of the upper front left and right sides 300S of the carrier. The lower stops 322L prevent the infant carrier 300 from moving downwardly to the seat 2 and the upper stops 322U prevent the infant carrier 300 from being lifted upwardly. This thus keeps the carrier locked onto the stroller.

Given the disclosure of the present invention, one versed in the art would appreciate that there may be other embodiments and modifications within the scope and spirit of the present invention. Accordingly, all modifications attainable by one versed in the art from the present disclosure within the scope and spirit of the present invention are to be included as further embodiments of the present invention. The scope of the present invention accordingly is to be defined as set forth in the appended claims.

We claim:

1. A foldable stroller comprising:

a foldable stroller frame convertible between an operating position for use and a folded position, the stroller frame having front left, front right, rear left, and rear right legs and front right, front left, rear right, and rear left wheels mounted to the respective legs, a handlebar frame pivotally connected to the rear left and right legs, and a seat support frame pivotally connected to the front left and right legs and rear left and right legs, the seat support frame having a portion that pivots toward the rear wheels when the frame is folded; and  
a canopy frame connected to the portion of the seat support frame that pivots toward the rear wheels, wherein as the stroller frame is folded, the portion of the seat support frame pivoting toward the rear wheels pulls the canopy frame toward the rear wheels.

2. A stroller according to claim 1, wherein the stroller frame further includes left and right hinge locks fixedly mounted respectively to the rear left and right legs, and ends of the handlebar frame are pivotally connected to the left and right hinge locks.

3. A stroller according to claim 2, wherein the stroller frame further includes a tray assembly comprising a front tray and left and right side arms connected to the front tray, the left and right side arms are pivotally connected to the handlebar frame, the front and rear left and right legs are pivotally connected to the left side arm, and the front and rear right legs are pivotally connected to the right side arm.

10

4. A stroller according to claim 3, wherein the seat support frame comprises a cross arm and left and right arms extending from the cross arm, the left arm being pivotally connected to the front left leg and the left hinge lock and the right arm being pivotally connected to the front right leg and the right hinge lock.

5. A stroller according to claim 4, wherein the handlebar frame comprises a handlebar connected to left and right push arms, which are respectively pivotally connected to the left and right hinge locks.

6. A stroller according to claim 5, wherein the left push arm and the left arms are pivotally connected to the left hinge lock about a common axis, and the right push arm and the right arm are pivotally connected to the right hinge lock about a common axis.

7. A stroller according to claim 6, wherein the left and right arms extend rearwardly beyond the common axes of the left and right hinge locks, the portion of the seat support frame that pivots downwardly when the frame is folded includes the left and right arms extending beyond the common axes, and the canopy frame is pivotally connected to the left and right arms extending beyond the common axes.

8. A stroller according to claim 7, wherein the cross arm connects ends of left and right arms extending beyond the common axes.

9. A stroller according to claim 3, wherein the handlebar frame comprises a left and right push arms and a handlebar pivotally connected to the left and right push arms respectively about left and right pivot assemblies.

10. A stroller according to claim 3, wherein a portion of the canopy spaced furthest from the pivotal connection to the seat support frame is positioned below the tray and is positioned between the handlebar frame and the tray when the stroller is folded.

11. A stroller according to claim 10, wherein the handlebar is pivotally movable to reduce the length of the handlebar frame during storage.

12. A method of retracting a canopy of a foldable stroller when the stroller is folded, comprising:

providing a foldable stroller having a foldable frame convertible between an operating position for use and a folded position, the stroller frame having front left, front right, rear left, and rear right legs and front left, front right, rear left, and rear right wheels mounted to the respective legs, a handlebar frame pivotally connected to the rear left and right legs, and a seat support frame pivotally connected to the front left and right legs and rear left and right legs, the seat support frame having a portion that pivots toward the rear wheels when the frame is folded;

mounting a canopy frame to the portion of the seat support frame that pivots toward the rear wheels so that, as the stroller frame is being folded, the canopy frame is pulled toward the rear wheels by the portion of the seat support frame pivoting toward the rear wheels.

13. A foldable stroller comprising:

a foldable stroller frame convertible between an operating position for use and a folded position, the stroller frame comprising:

front left, front right, rear left, and rear right legs and front left, front right, rear left, and rear right wheels mounted to the respective legs;



## US 6,478,327 B1

11

a handlebar frame pivotally connected to the rear left and right legs;

left and right hinge locks fixedly mounted respectively to the rear left and right legs, and the handlebar frame pivotally connected to the left and right hinge locks;

a tray assembly comprising a front tray and left and right side arms connected to the front tray, the left and right side arms pivotally connected to the handlebar frame, the front and rear left and right legs pivotally connected to the left side arm, and the front and rear right legs pivotally connected to the right side arm;

a seat support frame pivotally connected to the front left and right legs and left and right hinge locks, the seat support frame having a portion that pivots toward the rear wheels when the frame is folded; and

a canopy frame pivotally connected to the portion of the seat support frame that pivots toward the rear wheels,

wherein as the stroller frame is folded, the portion of the seat support frame pivoting toward the rear wheels pulls the canopy frame toward the rear wheels.

14. A stroller according to claim 13, wherein a portion of the canopy spaced furthest from the pivotal connection to the seat support frame is positioned below the tray and is positioned between the handlebar frame and the tray when the stroller is folded.

15. A stroller according to claim 14, further including an upper tray mounted to the handlebar frame and a one-hand actuator for unlocking the left and right hinge locks mounted to the upper tray.

16. A stroller according to claim 13, further including means for mounting an infant carrier in a rearwardly facing direction and providing at least two recline positions.

17. A stroller comprising:

a foldable stroller frame convertible between an operating position for use and a folded position, the stroller frame including:

front left, front right, rear left, and rear right legs;

a handlebar frame pivotally connected to the rear left and right legs;

left and right hinge locks fixedly mounted respectively to the rear left and right legs, and the handlebar frame pivotally connected to the left and right hinge locks;

a tray assembly comprising a front tray and left and right side arms connected to the front tray, the left and right side arms pivotally connected to the handlebar frame, the front and rear left legs pivotally connected to the left side arm, and the front and rear right legs pivotally connected to the right side arm;

a seat support frame pivotally connected to the front left and right legs and left and right hinge locks, the seat support frame having a portion that pivots downwardly when the frame is folded;

an upper tray mounted to the handlebar frame and a one-hand actuator for unlocking left and right hinge locks mounted to the upper tray; and

a canopy frame pivotally connected to the portion of the seat support frame that pivots downwardly, wherein as the stroller frame is folded, the portion of the seat support frame pivoting downwardly pulls the canopy frame downwardly, and

wherein the upper tray has at least one container holding compartment and an opening for inserting an

12

operator's fingers, the actuator being mounted to an underside of the upper tray for a movement between a pushed, actuated position and an un-actuated position.

18. A stroller according to claim 17, wherein the handlebar frame comprises a left and right push arms and a handlebar pivotally connected to the left and right push arms respectively about left and right pivot assemblies, the upper tray being mounted to the left and right pivot assemblies.

19. A stroller according to claim 18, further including left and right hinge-lock actuating members movably mounted to the left and right push arms, the left and right hinge-lock actuating members being operatively connected respectively to the left and right hinge locks.

20. A foldable stroller comprising:

a foldable stroller frame convertible between an operating position for use and a folded position, the stroller frame having a rear left and right legs and left and right hinge locks fixedly mounted respectively to the rear left and right legs, and a handlebar frame pivotally connected to the left and right hinge locks;

an upper tray mounted to the handlebar frame; and

a one-hand actuator for unlocking the left and right hinge locks mounted to the upper tray.

21. A stroller according to claim 20, wherein the handlebar frame comprises a left and right push arms and a handlebar pivotally connected to the left and right push arms about left and right pivot assemblies, the upper tray being connected to the left and right pivot assemblies.

22. A stroller according to claim 21, further including left and right hinge-lock actuating members movably mounted to the left and right push arms, the left and right hinge-lock actuating members being operatively connected respectively to the left and right hinge locks.

23. A stroller according to claim 22, wherein the actuator includes a handle and left and right linkage assemblies connecting the handle to the left and right actuating members.

24. A stroller according to claim 23, wherein each of the left and right linkage assemblies comprises a substantially U-shaped cross linkage and a push rod connected to the cross linkage, the cross linkage having first, second, and third arms, the third arm being pivotally journaled to the underside of the upper tray and joining the first and second arms, the first arm being connected to one side of the handle and the second arm being pivotally connected to the push rod, the push rod being connected to the respective left or right actuating member.

25. A stroller according to claim 20, further including means for mounting an infant carrier in a rearwardly facing direction and providing at least two recline positions.

26. A foldable stroller comprising:

a foldable stroller frame convertible between an operating position for use and a folded position, the stroller frame having a rear left and right legs and left and right hinge locks fixedly mounted respectively to the rear left and right legs, and a handlebar frame pivotally connected to the left and right hinge locks;

an upper tray mounted to the handlebar frame, the upper tray having at least one container holding compartment and an opening for inserting operator's fingers; and

a one-hand actuator, mounted to an underside of the upper tray, for unlocking the left and right hinge locks, the

US 6,478,327 B1

13

actuator being mounted for a movement between an actuated position and un-actuated position.

27. A stroller comprising:

front and rear legs;

a handlebar frame having a left and right push arms 5 pivotally connected to the rear legs;

a tray assembly comprising left and right side arms and a tray connected to the left and right side arms, the left and right side arms being pivotally connected to the left and right push arms, respectively; and 10

an infant carrier securing mechanism including a plurality of stops movably mounted to the left and right push arms and adapted to engage front portions of an infant carrier to removably mount the infant carrier in a rearwardly facing direction and in at least two recline positions, each of the stops being rotatable about the respective push arm between an engage position and a disengage position, which is rotated away from the engage position. 15

28. A stroller comprising:

front and rear legs;

a handlebar frame having a left and right push arms pivotally connected to the rear legs;

a tray assembly comprising left and right side arms and a tray connected to the left and right side arms, the left and right side arms being pivotally connected to the left and right push arms, respectively; and 25

an infant carrier securing mechanism connected to the handlebar frame, the securing mechanism adapted to engage front portions of the infant carrier to mount the infant carrier in a rearwardly facing direction and to provide at least two recline positions, the securing mechanism having a pair of lower stops and a pair of 30

14

upper stops respectively mounted rotatably to the left and right push arms, each of the stops being rotatable between an engage position and a disengage position, which is rotated away from the engage position, wherein the infant carrier is adapted to engage the lower stops to provide a first recline position for the infant carrier and is adapted to engage the upper stops and the lower stops to provide a second recline position.

29. A stroller according to claim 28, wherein the first recline position is more upright than the second position.

30. A foldable stroller comprising:

a stroller frame convertible between an operating position for use and a folded position, the stroller frame comprising:

front left, front right, rear left, and rear right legs;

a handlebar frame pivotally connected to the rear left and right legs;

left and right hinge locks fixedly mounted respectively to the rear left and right legs, and the handlebar frame pivotally connected to the left and right hinge locks; and

an upper tray mounted to the handlebar frame and a one-hand actuator for unlocking left and right hinge locks mounted to the upper tray,

wherein the upper tray has at least one container holding compartment and an opening for inserting an operator's fingers, the actuator being mounted to an underside of the upper tray for movement between a pushed, actuated position and an un-actuated position.

\* \* \* \* \*