United States Patent

Griggs

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[54] BABY JUMPER

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[52] **U.S. Cl.** **248/399**

[51] **Int. Cl.** **F16m 13/00**

[58] **Field of Search** 248/204, 399, 400, 401; 272/58

[56] **References Cited**

UNITED STATES PATENTS

3,054,591	9/1962	Cohn	248/401
3,066,906	12/1962	Berlin	248/399
3,076,628	2/1963	Smith et al.	248/399

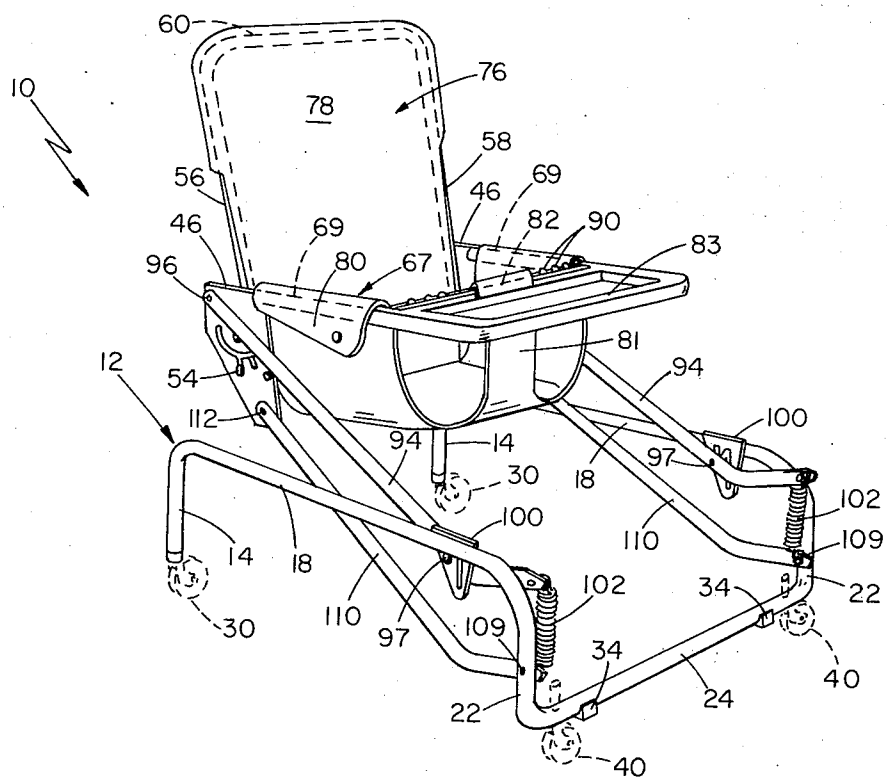
Primary Examiner—William H. Schultz

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[57] **ABSTRACT**

A collapsible baby jumper includes a base frame, and a seat frame disposed above the base frame movable to and from an upright or erected position and a collapsed position, supported on the base frame by a main diagonal brace member, arranged at each side of the seat and base frames, extending diagonally upwardly from the base frame, and having its upper end pivotally connected to the seat frame; each brace member has a pivot pin projecting therefrom at a position between its ends, and there is secured to each side of the base frame adjacent the pivot pins a pivot support means having two pivot support surfaces, one for upright position and the other for collapsed position, with a guide in which the adjacent pivot pin is engaged for controlling movement of the pin to and from the two support surfaces; and the forward end of each brace member is connected to the base frame by a downwardly extending tension spring which in its collapsed position forms a rigid link pivotally connecting the forward end of the brace member to the base frame.

10 Claims, 9 Drawing Figures



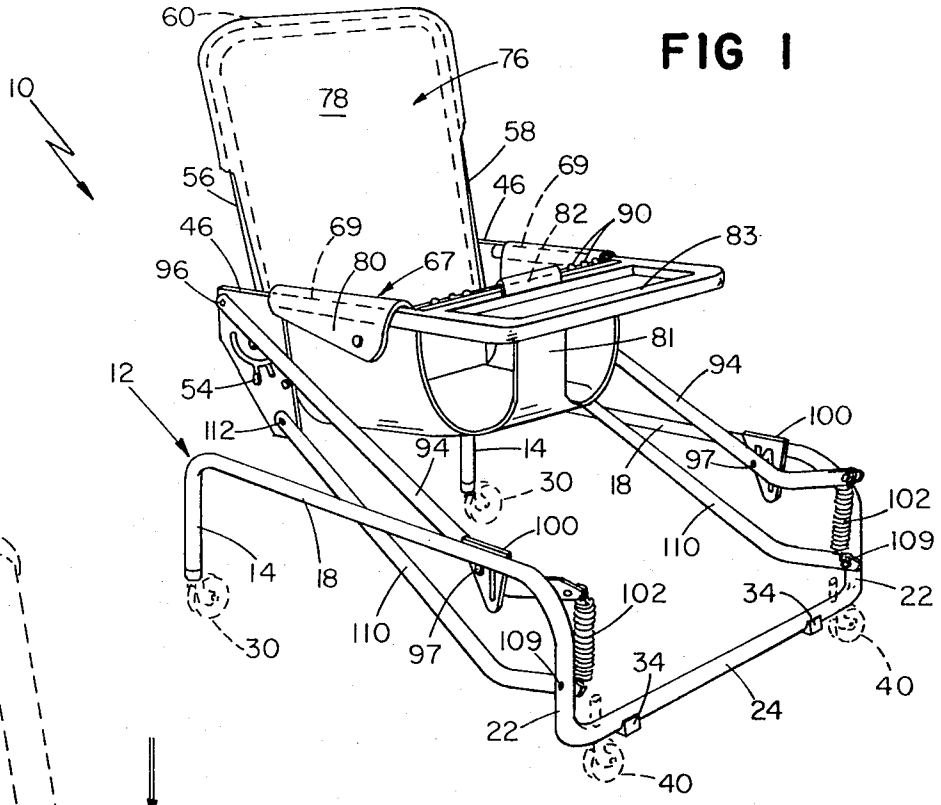


FIG 1

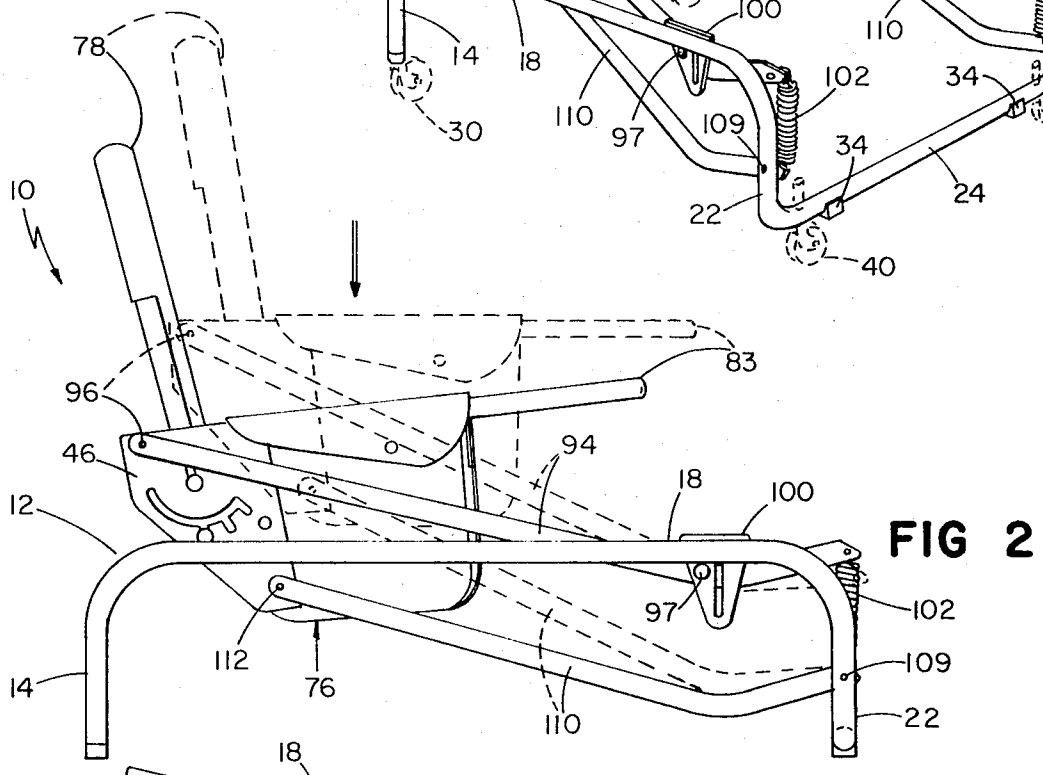


FIG 2

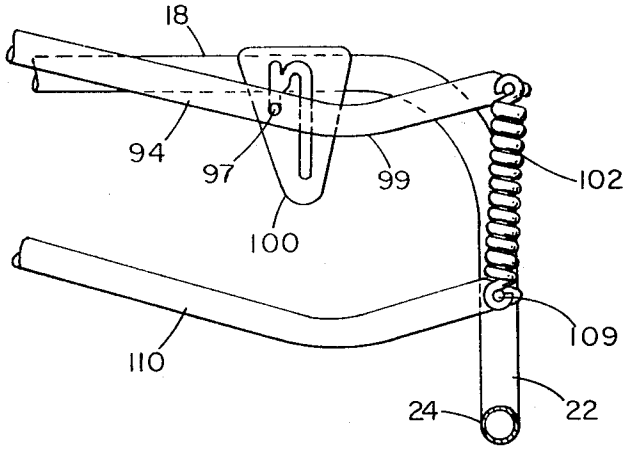
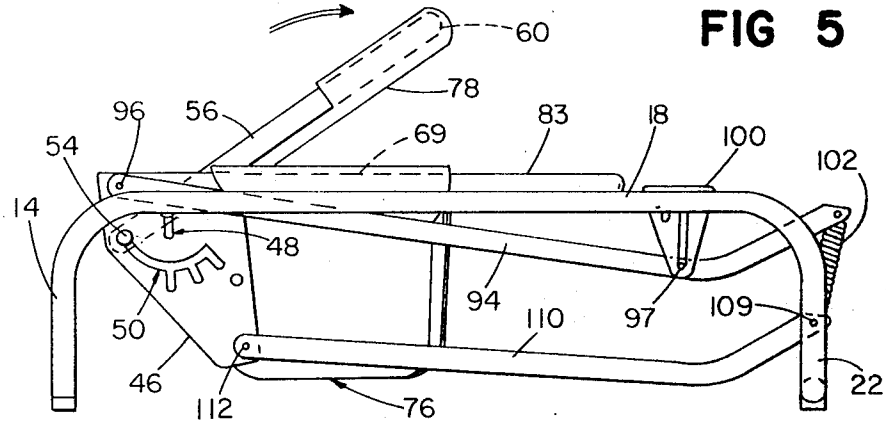


FIG 3

FIG 5



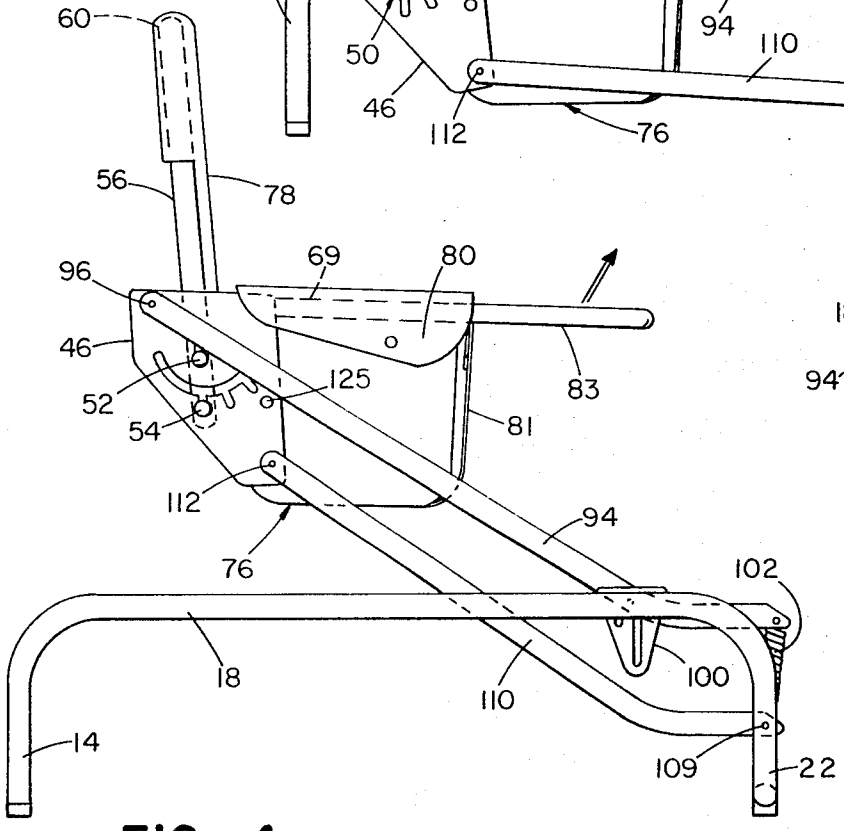


FIG 4

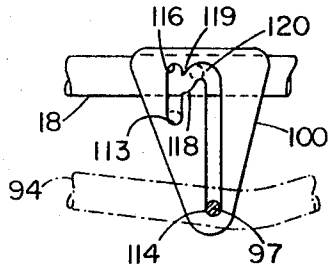


FIG 5a

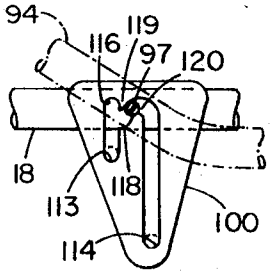


FIG 4a

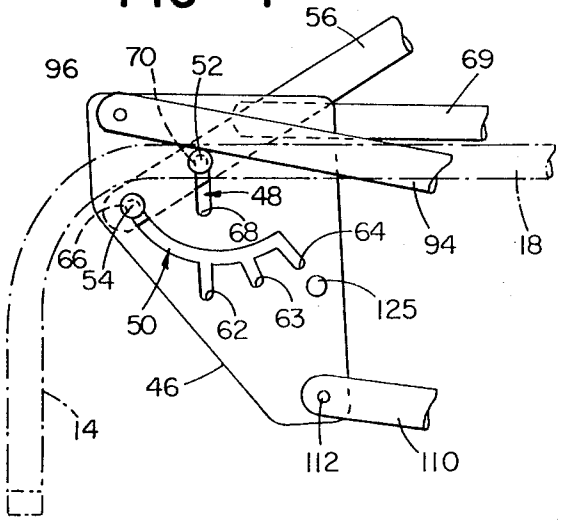


FIG 7

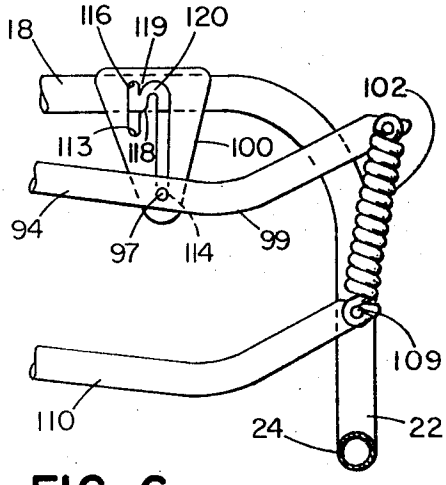


FIG 6

BABY JUMPER

This invention relates to collapsible baby jumper seats.

One object of this invention is to provide improved baby jumper seats, both stationary and mobile, which are easy to assemble and easy to collapse, and yet safely protected against accidental or improper collapse.

Another object is to provide a self-leveling jumper that will provide full and safe support, without tipping or wobbling, even on uneven or rocky ground.

The jumper of the present invention includes a base frame and a seat frame disposed above it movable to and from an upright or erected position and a collapsed position. The seat frame is supported on the base frame by a main diagonal brace member, arranged at each side of the seat and base frames, extending diagonally upwardly from the base frame, each member having its upper end pivotally connected to the seat frame. Each brace member is provided with a pivot pin projecting therefrom at a position between its ends, and there is secured to each side of the base frame adjacent the pivot pins a pivot support means having two pivot support surfaces, one for upright position and the other for collapsed position, with a guide in which the adjacent pivot pin is engaged for controlling movement of the pin to and from the two support surfaces. The forward end of each brace member is connected to the base frame by a downwardly extending tension spring which in its collapsed position forms a rigid link pivotally connecting the forward end of the brace member to the base frame.

To provide further collapsibility, the seat back frame can be pivotally mounted on the seat frame with means for releasably securing it in upright or erected position independently of the position of the seat frame.

An auxiliary brace member is preferably provided on each side of the jumper in the form of a rigid member generally parallel to the first brace member and pivotally connected with the seat frame and the base frame, the connections being located so that their pivot axes, together with the pivot axis of the connection between the first brace member and the seat frame and the pivot axis of the pivot pin when the seat frame is in upright position, are at the corners of a vertical parallelogram. This arrangement of the pivot axes ensures that the seat frame remains horizontal regardless of the extent to which it is depressed by the weight of the baby extending the tension spring.

The base frame includes a pair of laterally spaced apart support members at each side of the rear of the baby jumper, connected by spaced parallel horizontal flexible members extending forwardly to vertical support members having their lower ends connected by a connecting member extending across the front of the jumper. In a preferred embodiment the members of the base frame are formed from a single length of metal tubing.

Preferred pivot support means includes structure defining a slot sized to receive the pivot pin slidably therein, the slot being shaped to provide the two support surfaces, and a tortuous passage therebetween. In a preferred embodiment, the guide structure comprises a plate having a slot generally in the shape of an inverted J, of which the short end defines the support surface for the seat frame in its upright position, and the long side terminates in an end surface defining a second support surface for maintaining the seat in its collapsed position. The preferred J-slot further includes a restricted opening between the short side and the long side barely sized to pass the pivot pin therethrough to inhibit accidental collapse of the jumper. In addition, the J-slot may have an extended short side extending upwardly past the curve of the J to define an elongated slot permitting reciprocating vertical movement of the pin in the slot during jumping reciprocation of the seat, and defining a stop removably capturing the pin against movement toward collapsed position. There may also be provided an indentation on the inside of the J-slot adjacent its short side providing a large opening adjacent the restricted opening for inhibiting movement of the pin into the restricted opening.

In addition, the seat preferably includes a stop member projecting from each side, these stop members being arranged to engage the brace members and hence thereby to limit the rotation of the seat upwardly about its pivot axis and prevent it from being turned inside out.

Other objects, features and advantages will be apparent to one skilled in the art from the following description of preferred embodiments of this invention, taken together with the attached drawings thereof, in which:

FIG. 1 is a perspective view of a baby jumper in upright position constructed in accordance with the present invention;

FIG. 2 is a side elevation view showing in full lines the jumper in a partly lowered "jumping" position with the tension spring extended, and in broken lines in a rest position;

FIG. 3 is an enlarged side elevation view, partly broken away, showing the spring and J-slot arrangement, with the seat partly lowered, and spring extended, as in FIG. 2;

FIG. 4 is a side elevation view showing the jumper in the process of being collapsed;

FIG. 4*a* shows the J-slot with the pivot pin in position corresponding to the jumper position of FIG. 4;

FIG. 5 is a side elevation view of showing the jumper in its fully collapsed position;

FIG. 5*a* shows the J-slot with the pivot pin in position corresponding to the collapsed jumper position;

FIG. 6 is an enlarged view, like FIG. 3, showing the spring and J-slot arrangement with the seat collapsed as in FIG. 5; and,

FIG. 7 is an enlarged side elevation view showing the seat support plate with the seat collapsed as in FIG. 5.

The drawings show a baby jumper **10** supported on a base frame **12** having independent rear vertical support members **14**, horizontal, flexible, and resilient support members **18**, forward vertical support legs **22**, and a forward horizontal connecting member **24**, all of which may be (and at least the support members preferably being) formed of tubular steel. Support members **14** each are mounted in rubber or plastic cups **28**, to prevent scuffing of floor surfaces, and also may be provided with openings through their bottoms for alternatively receiving the shafts of wheels **30**, to make the jumper mobile. Similar cups **34** may be arranged beneath connecting member **24** at suitably spaced locations, and apertures are provided through member **24** at **38** to accept the shafts of wheels **40**.

Referring to FIGS. **1**, **2** and **7**, a pair of spaced apart seat frame plates **46** each includes upper slots **48** and lower slots **50** for supporting, respectively, upper pivot members **52** and lower pivot members **54** projecting from the ends of the arms **56**, **58** of U-shaped seat back frame **60**. The lower slots **50** each has three upright positions **62**, **63**, **64**, and a collapsed position **66** for determining the orientation of U-shaped seat back frame **60**, whereas the upper slots **48** have two positions **68**, **70**, position **68** arranged to support an upper pivot member **52** when the lower pivot member **54** is in one of the upright positions and position **70** arranged to support an upper pivot member **52** when the lower pivot member **54** is in the collapsed position. A U-shaped seat support frame **67** has its arms **69** rigidly secured to seat frame plates **46**. A fabric seat **76** has a back pocket portion **78** slipped over U-shaped back frame **60**, side flaps **80** snapped around arms **69**, respectively, of seat support frame **67**, and a front flap **81** snapped around a cross-rod **82** of frame **67**. A tray **83** may be mounted on the forward portion of seat frame **67** and beads **90** may be slidably mounted on rod **82**. Both U-shaped frames **60** and **67** may be formed of tubular steel.

For supporting the U-shaped frames **60** and **67** and the seat, main diagonal brace members **94** are rotatably secured at one end on pins **96**, which are journalled through seat frame plates **46**. A pivot pin **97** (FIG. 3) protrudes from each brace member at bend **99**, and has an enlarged head retaining the pin in a slot in pivot support **100**, which is rigidly mounted on each horizontal support member **18** near the forward end of the member. Each vertical spring **102** is pivotally secured at one end to the forward end **104** of a brace member **94** and at

its other end by pin **109** to a support leg **22**. Each lower diagonal brace member **110** is pivotally secured at one end on pin **112** to seat support plate **46**, and at its other end by pin **109** to support leg **22** along with spring **102**. Brace members **94** and **110** may also be formed of tubular steel.

Referring to FIG. **4***a* or **5***a*, each pivot support **100** has a slot generally in the form of an inverted J, sized to slidably receive pivot pin **97**. The short side of the J-slot defines the upright pivot support surface **113**, and the long side defines the collapsed pivot support surface **114**. The J-slot has a vertical upward extension **116** of its short side and a cut-away portion at **118**, defining an ear **119** and a more restricted passage **120** (although of substantially the same width as the sides of the slot) between the short and long sides of the slot. The purposes for these shaped surfaces will be described below.

Pins **96**, **97** (when positioned on pivot support **113**), **109** and **112** are arranged to define a parallelogram in a vertical plane, thus maintaining seat support frame **60** in horizontal position regardless of the angle of slope of the brace members **94**, **110** and the extent to which the seat frame is depressed by the weight of the baby.

A protruding stop **125** on each seat support plate **46** limits rotational movement of each brace member **94** about the respective pin **96**, as seen in FIG. **4**.

In upright position, as shown in FIG. **2**, with the pivot pins **97** residing in the short side of the J-slot on support surface **112**, the seat support frame, while itself remaining horizontal, may be moved downwardly by pivoting about the axis defined by pins **97** by stretching tension springs **102** to the position shown in FIGS. **2** and **3**. The length of brace member **94** between seat support plate **46** and pivot pin **97** being far greater than that between pivot pin **97** and spring **102**, the vertical distance travelled by the seat may be far greater than the extension required of the springs thus enabling a baby to enjoy substantial bouncing or jumping movement while in the seat. Not only can the seat travel downwardly from the rest position shown in FIG. **1**, but it can also move upwardly by pivoting on another axis, that defined by the points of engagement of the brace members **94** and the springs **102**, about a fully compressed rigidified spring, with the pivot pins **97** lifting off support surfaces **113** and travelling up the short side of the J-slot (FIGS. **4** and **4***a*). This arrangement permits an active baby to bounce or jump in the seat quite violently, causing the seat to move from a low position somewhat lower than that shown in FIG. **2** to a high position in which pin **97** is at the top of extension **116** of the inverted J-slot. However, by virtue of the shape of the J-slot between its sides, including the extended short-side at **116** and cutaway portion **118**, any tendency of the pins **97**, when reaching the top of the slot, to cross to the long side of the J and collapse the jumper is practically prevented. The pins, travelling up the short side of the J-slot, upon reaching the top, are impeded by the protruding ears **119** from travelling forward toward the long side of the J-slot, and hence tend to return down the short side back to support surfaces **113**. In addition, any forward movement of the pins **97** toward the long side of the J-slot on their way back down is further impeded by the restricted passage **120**, requiring the pins to travel a tortuous path down past ear **119** and then back up into restricted passage **120**, an improbable path to be accidentally duplicated. Any accidental forward movement of the pins **97** leads to their capture in the cutaway **118**, which causes the pins to slide back down onto support surface **113**. Accidental collapse of the seat is thus substantially and safely inhibited.

Intentional collapse of the jumper from its upright position is easily accomplished by grasping the support frame **67** or the tray **74** with one hand, guiding the pins **97** up along the short-side of the J-slot, as shown in FIGS. **4** and **4***a*, until the stop **125** is engaged by the brace **94**, then through restricted passage **120**, and into the long side of the J-slot, thereafter letting the pins fall freely onto support surface **114**. This movement is shown in FIG. **5***a*. As shown in FIG. **6**, each spring **102** acts during this collapse movement as if rigid, and pivots about pins **109** to allow brace members **94** to be pivoted about their forward ends **104** and also moved forward of support legs **22**, thus enabling collapse of the jumper to take place. The stop **125** on each seat support plate is positioned to engage brace member **94** about the same time that pins **97** reach the top of the J-slot, thus making it impossible to tilt the seat frame inside-out during collapse. The back support frame may be pivoted also to its collapsed position by moving lower pivot members **54** into the collapsed position **66**, as shown in FIGS. **5** and **7**.

Since the springs **102** are under tension only when the pins **97** rest on support surfaces **113**, the springs **102** need not be disengaged either to collapse or to erect the jumper seat, nor do they offer any resistance to such movements. Furthermore, the J-slots guide pivot pins **97** during the erecting of the seat. As a result, the seat can be manipulated with one hand, using very little force, even by one carrying an infant in the other hand.

An additional feature of the support frame is the self-leveling of the jumper. Not only are the rear vertical support members **14** not connected to one another, but further, the long, flexible and resilient members **18** extend between each of these independent rear support members **14** and the point of attachment of the diagonal brace members **94**, **110** to the base frame near horizontal connecting member **24**. As a result, the support members **14** may each rest on slightly different levels, compensated through flexing of the flexible and resilient members **18**, so that both of the front mounting cups **34** or wheels **40** will be maintained firmly on the ground and the jumper will not tend to wobble or tip, even when, e.g., one of the vertical supports rests on a pebble.

Other embodiments will occur to one skilled in the art and are within the following claims.

What is claimed is:

1. A collapsible baby jumper comprising a base frame, a seat frame disposed above said base frame and movable to and from upright and collapsed positions, a diagonal brace structure arranged on each side of said seat frame, each said brace structure comprising a diagonal main brace member pivotally connected at one end to said seat frame and each including a pivot pin extending therefrom between its ends, pivot means secured to each side of said base frame, providing a support surface for supporting one said pivot pin and providing thereby a pivot axis for said brace member on said support surface, and a tension spring secured between said base frame and the opposite end of each one of said brace members on each side of said base frame, each spring being adapted and arranged to resist downward movement of said seat frame on said brace members about said pivot axes, said pivot means constructed so as to permit said pins to be lifted off said support surfaces to pivot said brace members about second pivot axes located at their ends secured to said springs to collapse said seat, at least one of said pivot means including guide structure for limiting movement of said pin to and from said support surface.

2. The baby jumper of claim **1** wherein said guide structure comprises a slot generally in the shape of an inverted J, of which the short side terminates in a surface defining said support surface to maintain said seat in its upright position, and said long side terminates in a surface defining a second support surface for supporting said pin with said seat in its collapsed position.

3. The baby jumper of claim **2** wherein said J-shaped slot includes a restricted opening between said short side and said long side barely sized to pass said pivot pin therethrough to inhibit accidental collapse of said jumper.

4. The baby jumper of claim **3** wherein said slot has a vertical upward extension of its short side permitting reciprocating vertical movement of said pin in said extension during normal jumping reciprocation of said seat frame.

5. The baby jumper of claim **1** wherein said springs are arranged to provide a rigid link pivotally connecting the said brace member to said base frame when said pivot pin is off said pivot surface.

6. The baby jumper of claim 1 wherein said guide structure comprises a slot sized to receive said pivot pin slidably therein, said slot shaped to provide said pivot support surface, a second support surface for supporting said pin with said seat in its collapsed position and a tortuous passage between said surfaces.

7. The baby jumper of claim 1 wherein each said brace structure includes an auxiliary rigid brace member pivotally connected to said seat frame and said base frame and generally parallel to the main brace member, constructed and arranged so that the pivot axes of the auxiliary brace member connections and of the main brace member connection to the seat frame together with the pivot axis of said pin when the seat frame is in upright position are at the corners of a vertical parallelogram.

8. The baby jumper of claim 1 wherein said seat frame includes a stop member projecting from each side thereof, each stop member arranged to engage one of said brace members and thereby to limit the rotation of said seat upwardly about said pivot axes.

9. A baby jumper comprising a base frame, a seat, a seat frame disposed above said base frame, a diagonal base structure arranged on each side of said seat frame, each said base structure comprising a brace member pivotally secured at one end to said seat frame, pivot means secured to said seat frame, on each side of said seat, for pivotally supporting each said brace member between its ends providing a pivot axis for said member, and a tension spring secured between said base frame and the opposite end of each one of said brace members on each side of said base frame, each spring being adapted and arranged to resist downward movement of said seat frame about said pivot axes, said base frame comprising spaced apart support members adjacent the rear of and one on each side of said seat frame, for providing spaced-apart independent support for said seat, parallel horizontal flexible members extending from vertical members at their rearward end, toward the front of said seat, and forward support structure comprising spaced-apart, vertical support legs, supporting the forward ends of said horizontal flexible members, and a connecting member connecting the bottoms of said vertical support legs across the front of said seat frame, said pivot means being secured to said horizontal flexible members, and each said spring being connected to said forward support structure.

10. The baby jumper of claim 9 wherein each said spring extends vertically at least partway along one of said vertical legs of said forward support structure and is secured to one of said legs, said pivot means are located near the forward ends of said horizontal flexible members, and said brace members include portions extending between said pivot means and said spring means closely adjacent said horizontal flexible members.

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