United States Patent [19]

Baker, Sr.

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[54] **DRAPERY SUPPORTING LINKAGE**

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[73] Assignee: **Baker Drapery Corporation**, Peoria, Ill.

[22] Filed: **May 20, 1974**

[21] Appl. No.: **471,339**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 332,711, Feb. 15, 1973.

[52] **U.S. Cl.** ..... **16/87.2**; 16/93 D; 16/137 R; 16/191; 16/169

[51] **Int. Cl.**[2] **E05D 13/02**

[58] **Field of Search** ..... 16/87 R, 87.2 R, 87.4 R, 16/191, 93 D, 94 D, 95 D, 96 D, 137 R, 87.2, 137, 191, 169

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Primary Examiner—George H. Krizmanich
Attorney, Agent, or Firm—Wegner, Stellman, McCord, Wiles & Wood

[57] **ABSTRACT**

A drapery supporting linkage, adapted to be suspended from a stationary supporting rod and adapted to receive and hold the draperies in snap-on fashion, including a plurality of links pivotally interconnected adjacent their ends, in zigzag fashion, so that the links form the pleats in the draperies as they open and close, there being provided a pair of projecting ears on one end of each link supporting a male post therebetween, and an arcuate female hinge part or segment is formed integral with the body portion of the other end of each link. The male post end of one link is positioned next to the female hinge part of the adjacent link with the female hinge part receiving the male post to form a hinge connection between the adjacent links, there also being provided a pair of projecting ears adjacent the female hinge part or segment, but separately therefrom, to engage the projecting ears supporting the male post to limit the pivotal movement of the links with respect to one another. In one form of linkage, the projecting ears on the female segment have contact surfaces oriented in a way to contact the ears on the male post end of the adjacent link to guide the links into position for assembly and disassembly with reduced breakage of parts of the linkage. The linkage may have only one drapery supporting groove thereby reducing the size of the link and the amount of material used to make the link.

14 Claims, 8 Drawing Figures

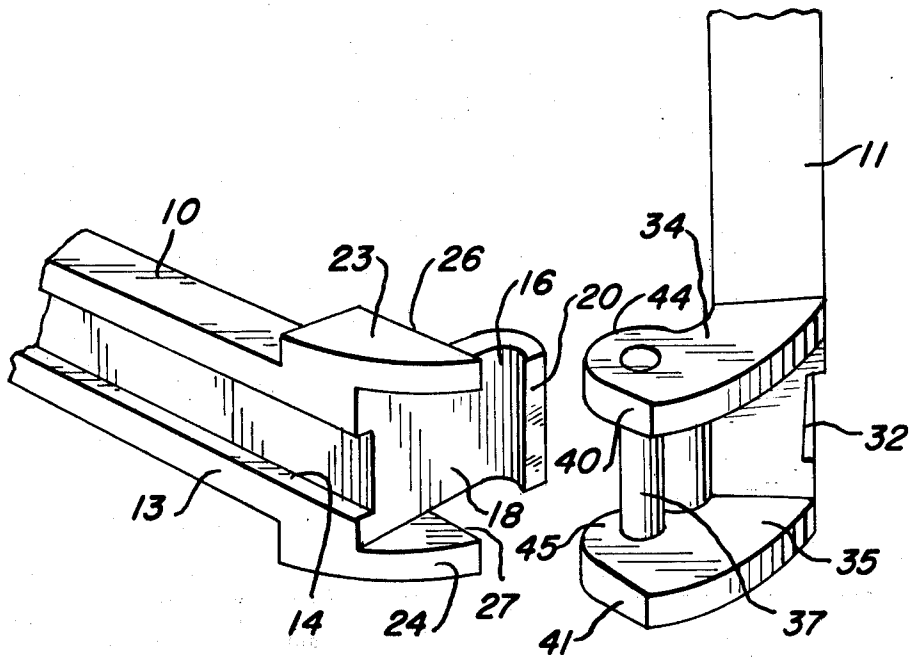


FIG. 3

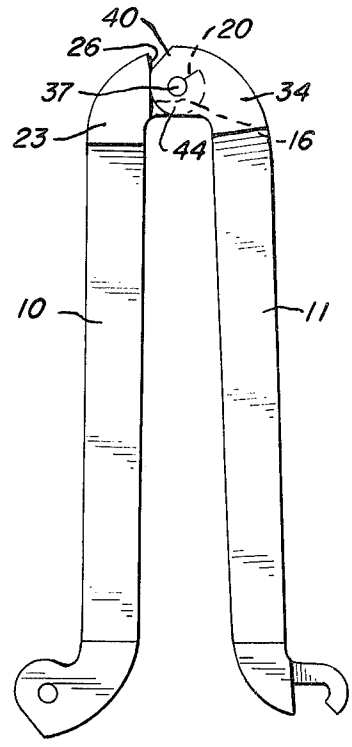


FIG. 2

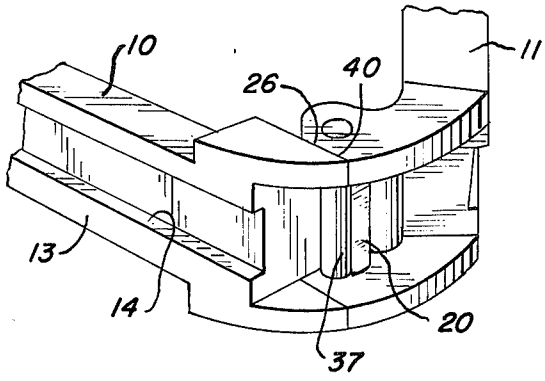


FIG. 1

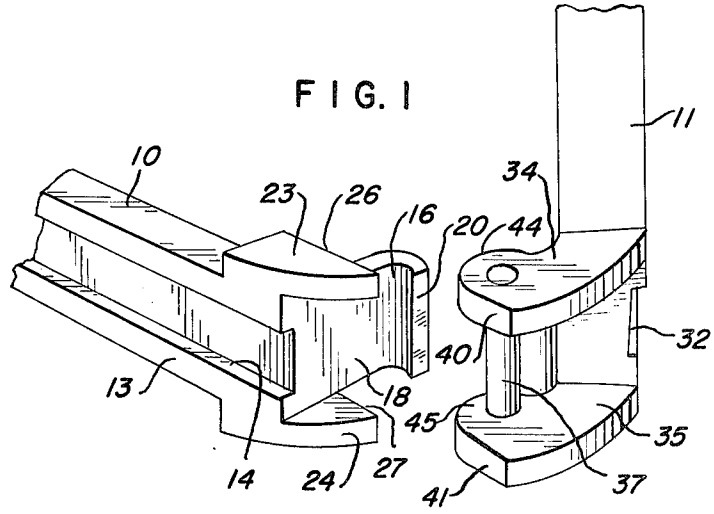


FIG. 4

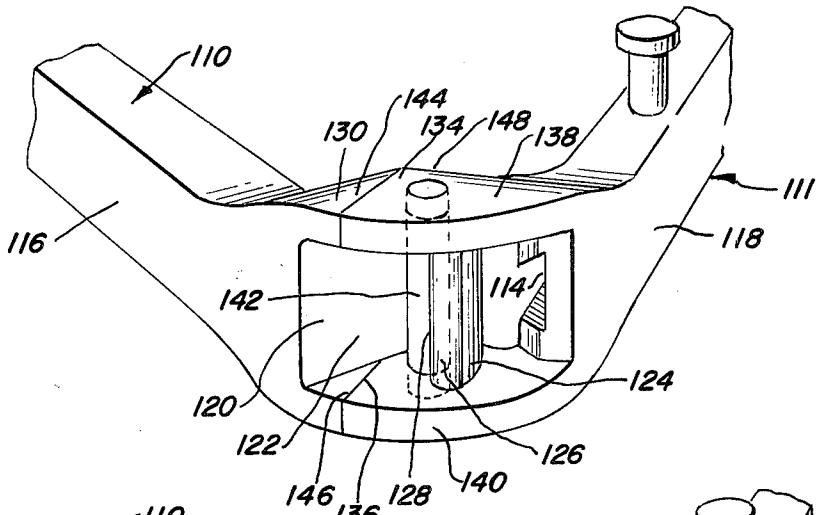


FIG. 5

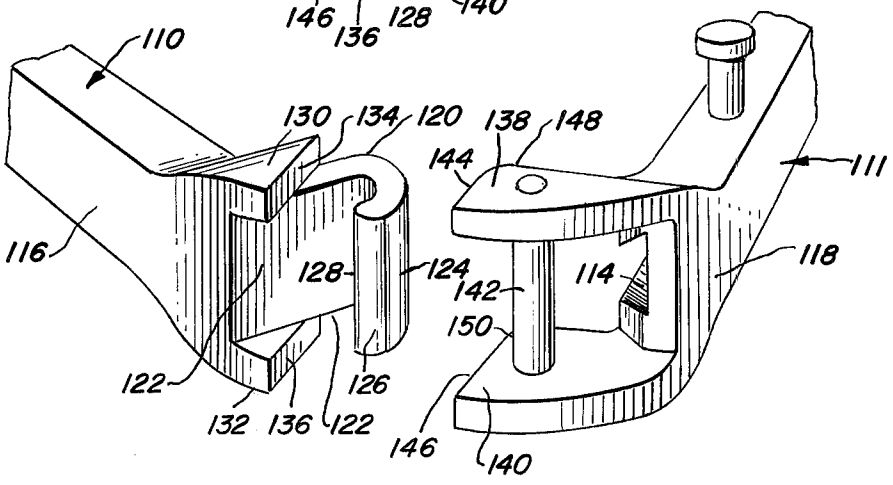


FIG. 6

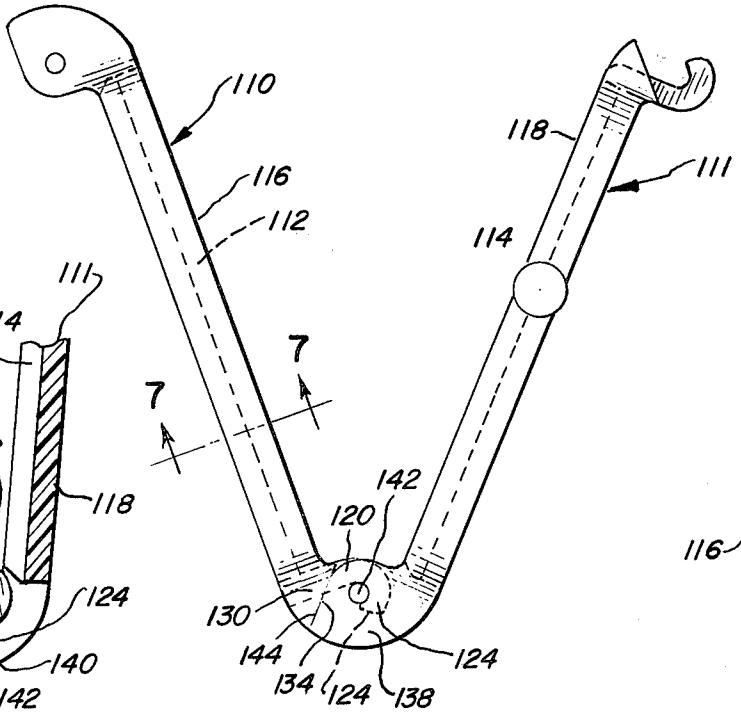


FIG. 8

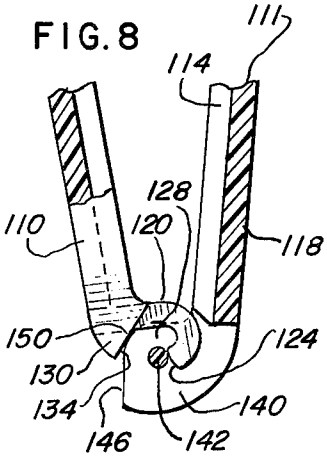
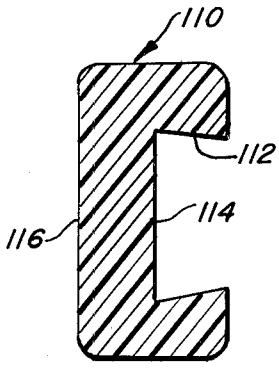


FIG. 7



DRAPERY SUPPORTING LINKAGE

BACKGROUND OF THE PRESENT INVENTION

The present invention relates to an improvement over the drapery supporting linkage system described and claimed in my copending application, Ser. No. 152,879, filed June 14, 1971, entitled "Drapery Support", assigned to the assignee of the present invention. The present application is a continuation-in-part application to copending application Ser. No. 332,711, filed Feb. 15, 1973.

In application Ser. No. 152,879, sets of drapery supporting links were provided in zigzag or accordian fashion, pivotally interconnected adjacent their ends. The links have dovetail slots that receive snaps adjacent the tops of the draperies, so that the linkages inherently form the pleats for the draperies, as they open and close. A male post is provided between projecting ears, adjacent one end of each link and a female hinge part is formed on the other end of each link. The female hinge part of the link is supported by a pair of ears extending from the link. With the male post of one link operatively engaged with the female segment of an adjacent link, the two links are hinged relative to each other. The ears on the respective links serve the purpose of limiting the pivotal movement of one link with respect to another, to maintain the pleated configuration of the draperies in all positions.

It has been found that the force applied to the female hinge part or segment by the male post as the linkage unfolds during closing movement of the drapery acts to bend or push back the female hinge part. This has a tendency to loosen the hinge, and the linkages sometimes become disengaged. In an extreme case, the female hinge part or the ears which support the female hinge part may be broken.

It is the primary object of the present invention to overcome this problem.

SUMMARY OF THE PRESENT INVENTION

In accordance with the present invention, a zigzag or accordian pleated linkage system is provided, with a hinge that does not loosen and which minimizes the possibility of linkage cracking or breaking. Toward this end, one end of each link has an arcuate pair of projecting ears that support therebetween a cylindrical male post. The other end of each link has an arcuate, female hinge part or segment opening toward the end of the link and projecting from the link body portion to rigidify the linkage construction, and pivotally receive the male post of an adjacent link. With the female hinge part or segment integral with the body portion of the link, the force on opening the hinge connection is directed axially into the body of the link from the female hinge part, and the female hinge part is not bent. Extending completely, separately from this female member, but adjacent thereto, are a pair of projecting ears, that are aligned with the projecting ears adjacent the male post on the opposite links, for the purpose of limiting pivotal movement of one link with respect to another.

Thus, as the links pivot in an opening direction, the pair of ears adjacent the male portion engage the pair of ears adjacent the female portion, and limit further pivotal movement therebetween. Any stresses occurring as a result of this abutting contact are transferred from the projecting ears directly to the body portion,

without any of the force passing through the female hinge part or segment.

The links are provided with only one drapery supporting groove thereby making it possible to reduce the size of the cross section of the link and therefore, to reduce the amount of material needed to make up the links.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of two links spaced from one another;

FIG. **2** is a similar perspective view with the links pivotally interconnected;

FIG. **3** is a plan view of two of the links pivotally interconnected;

FIG. **4** is a perspective view of a modified form of the invention showing two links pivotally interconnected;

FIG. **5** is a similar perspective view with the links spaced from one another;

FIG. **6** is a plan view of two of the modified links pivotally interconnected;

FIG. **7** is a cross-sectional view taken along the lines **7—7** of FIG. **6**; and

FIG. **8** is a plan view of the connection of FIG. **6** shown in two different positions.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and particularly FIGS. **1** to **3**, links **10** and **11** are provided which are adapted along with other pivotally interconnected links to be slidably supported by suitable carriers from a traverse rod. The links **10** and **11**, along with their pivotally connected adjacent ones are arranged in zigzag or accordian fashion, so that they pleat the drapery inherently, as the links open and close during traversing movement along the associated stationary traverse rod. Suitable projections are provided on each of the links **10** and **11**, intermediate the ends thereof, that are received in the carriers slidable axially in the traverse rod as described more fully in my copending application, Ser. No. 152,879, filed June 14, 1971, entitled "Drapery Support". As shown in the drawing, FIG. **1**, FIG. **2** and FIG. **3**, links **10** and **11** are identical to each other but during assembly and use they are reversed end for end with respect to each other. The link **10** includes a generally rectangular body portion **13** constructed of a plastic molding as are both the links, having a dovetail slot **14** that receives snaps on a tape affixed to the top of the drapery, so that the drapery panels may be simply snapped on to the linkage assemblies.

Projecting directly from the body portion **13** is a female hinge part or segment **16**, consisting of a straight portion **18** generally at a right angle to the body and an arcuate segment **20**, providing a female opening facing generally away from the end of the link **10**.

Formed separately from the female hinge part or segment **16** are integral flanges **23** and **24** generally arcuate in configuration having abutting stop surfaces **26** and **27**. It is important to note that any forces transferred to the surfaces **26** and **27** pass directly to the body portion **13** without being transferred to the female segment **16**.

The adjacent link **11** also has a dovetail slot **32** for receiving the drapery supporting snaps. Adjacent one end of the link **11** is a pair of of arcuate ears **34** and **35** that rigidly support therebetween a cylindrical male post **37** that is received within the female opening

formed by the arcuate segment **20** of the female hinge part **16,** as shown more clearly in FIG. **2.** The arcuate ears or projections **34** and **35,** have, respectively, stop surfaces **40** and **41** that engage the surfaces **26** and **27** of the flanges or ears **23** and **24** on link **10** as shown clearly in FIG. **2.** As noted above, as the links move to their fully open position shown in FIG. **2,** the stop surfaces **40** and **41** engage the surfaces **26** and **27** on link **10** placing a load on the flanges or ears **23** and **24.** This force is not transferred through the female member **16** but rather is transferred directly to the body portion **13** giving the linkage assembly added strength.

The arcuate projecting ears **34** and **35** have arcuate portions **44** and **45,** so as not to inhibit the pivotal movement of the links, as shown in FIG. **3.**

FIGS. **4–8** disclose a modification of the invention wherein the abutting surfaces on the male post end of the one link and the female hinge part end of the other link are located relative to each other in such a way as to permit connection or disconnection between said ends of the links with reduced risk of breaking the parts of the links. Links **110** and **111,** which are identical to each other, have a single dovetail slot **112** and **114,** respectively, formed in one side of the body portion **116** and **118** thereof which use of the single dovetail slot makes it possible to manufacture the bodies of the links smaller in cross section thereby using approximately 60% less material without sacrificing any strength in the body of the link. The single dovetails **112,114** may be on either side of links **110,111,** respectively, but, as shown, are formed on the facing surfaces of said links **110,111** when said links are assembled together.

Projecting directly from and formed integrally with one end of the link **110** is female hinge part or segment **120** having a straight portion **122** lying generally at right angles to the axis of the link **110.** The female hinge part or segment **120** has an arcuate curved portion **124** at its outer end portion which curls away from the body **116** of the link **110** with an angled end surface **126** and an overhanging lip **128** extending back over part of said straight portion **122.**

Formed separately from the female hinge part or segment **120** are flanges **130,132** which extend beyond the plane of the straight portion **122** and have abutting stop surfaces **134,136** lying in a plane disposed at an acute angle with respect to the axis of the link **110** and, as shown, are at a 45° angle with respect to both the straight portion **122** and the body **116** of the link **110.** The stop surfaces **134, 136** extend from a point beyond the end of the link **110** to a point approximately aligned with the overhanging lip **128.**

The adjacent link **111** has a pair of spaced apart arcuate ears **138,140** extending beyond one end of the body portion **118** thereof. A cylindrical male post **142** is rigidly supported between said ears **138,140.** The arcuate ears **138,140** have, respectively, stop surfaces **144,146** that are adapted to abut surfaces **134,136** when the female hinge part **120** has the arcuate portion **124** nested around the male post **142** as is shown in FIGS. **4** and **6.** The center of the male post **142** forms the axis about which lower arcuate or circular guiding surfaces **148,150** are formed as continuations, respectively, of the stop surfaces **144,146.** The stop surfaces **144,146** lie in a common plane which plane is substantially parallel to the axis of the body portion **118** of the link **111.**

In assembling link **110** to link **111,** the female hinge part **120** of link **110** is positioned relative to the male post **142** of link **111** with the arcuate curved portion **124** extending between the male post **142** and the end of the body portion **118** of the link **111.** As shown in solid lines in FIG. **8,** due to the angling of the stop surfaces **134,136** with respect to the female hinge part or segment **120,** the male post **142** will be positioned against end surface **126** with the female hinge part **120** between the ears **138,140** and the guide surfaces **148,150** engaging the stop surfaces **134,136.** With the links **110** and **111** lying parallel to each other, the plane of the stop surfaces **144,146** of the male post end of the link will pass through the link **110** between the front and back walls of the body portion **116** of link **110** and the male post **142** will lie on the angled end surface **126** overlapping the lip **128.** Relative pressure on the link **111** axially relative to link **110** will exert a force between the male post **142** and the angled end surface **126** on female hinge part **120** roughly parallel to the plane of said surfaces **134,136.** The male post **142** will snap past the lip **128** as the surfaces **148,150** of the ears **138,140** of link **111** are cammed down the plane of the surfaces **134,136** on the female hinge part **120.** With the male post **142** received by the arcuate segment **124** of female hinge part **120,** the lip **128** will retain the links in pivoting relation with respect to each other as the guiding surfaces **148,150** on the ears **138,140** ride on the surfaces **134,136** of the female hinge part **120.** The respective surfaces **134,136** on the female hinge part end of link **110** will abut and limit the extent of pivoting of the link **111** when stop surfaces **144,146** on link **111** abut said surfaces **134,136.** The camming force between the male post **142** and the female hinge part **120** are roughly parallel to the plane of the stop surfaces **134, 136** which forces are less than the comparable assembling or disassembling forces required to connect or disconnect the female hinge part **16** from the male post **37** of the links **10,11,** respectively, of the FIGS. **1–3** version of the invention.

The two illustrated forms of the invention have the female hinge part integrally formed with the body of the link and have flanges formed on the body of the link independent of said female hinge parts so that with the male post of an adjoining link assembled with said female hinge part, excessive forces attempting to open the angle between the hinged links will not break the flanges or the female hinge part. In adddition, the orientation of the abutting surfaces on the flanges adjoining the female hinge part permits easier assembly and disassembly of a male post of an adjacent link. The incorporation of only one dovetail slot in the body of each link permits the body of the link to be made of a smaller cross section with a considerable saving in material and therefore cost.

I claim:

1. An accordian linkage for a drapery support, comprising:

first link means having an end portion,

second link means having an end portion pivotally interconnected to said end portion of the first link means,

each of said link means having an elongated body portion,

means pivotally interconnecting said link means including a male member carried by and supported adjacent the end of one of the link means and a female member receiving said male member and

carried by and supported adjacent the end of the other link means,

one of said members being formed integrally with the associated body portion, a projection formed integrally with and extending axially from at least one of said body portions to limit pivotal movement of said first and second link means, said one of said members being supported completely independently of said projection.

2. An accordian linkage for a drapery support, as defined in claim **1**, wherein said female member is said one member and is integral with the link means having the projection.

3. An accordian linkage for a drapery support, as defined in claim **1**, wherein both of said link means has a pair of projections extending from at least one end thereof, the projections on one link means being aligned with the projections on the other link means to limit pivotal movement of one link means with respect to the other, said female member being supported on said first link means independently of the projections extending therefrom.

4. An accordian linkage for a drapery support of claim **1**, wherein said female member has an arcuate segment opening away from the end of the associated link means.

5. An accordian linkage for a drapery support comprising,

a first link,

a second link pivotally connected adjacent its end to said first link,

drapery support means on each of said links, each of said links including an elongated, generally rectangular body portion, an arcuate pair of projections extending from the end of said first link,

a male post supported between said projections,

a female segment carried by said second link, said segment having a flange portion extending transverse to the axis of said second link and having an axially facing arcuate curved portion on the outer end of said flange portion,

said arcuate curved portion of said female segment receiving said post and being supported on the end of said second link,

a second pair of projections extending axially from the end of said second link independently of said female segment, said second pair of projections being spaced from and facing said arcuate curved portion, said first pair of projections being aligned with and contacting said second pair of projections to limit pivotal movement of the first link with respect to the second link,

and said first pair of projections being spaced from said male post a distance sufficient to said said male post in said arcuate curved portion of the female segment when said first pair of projections is in engagement with said second pair of projections.

6. An accordian linkage for a drapery support, as defined in claim **4**, in which said flange portion of the female member is a straight portion joining said arcuate curved portion to the elongated body portion of the link means.

7. An accordian linkage for a drapery support, as defined in claim **6**, in which the force exerted by the male member on the female member as the linkage unfolds is directed axially of the body portion of the link.

8. An accordian linkage for a drapery support, as defined in claim **5**, in which said second pair of projections extending from the second link have abutting surfaces lying in a plane forming an acute angle with respect to the axis of said link whereby the male post will be guided in a plane parallel to said plane of said abutting surfaces during assembly of said male post with said female segment.

9. An accordian linkage for a drapery support comprising,

a first link,

a second link pivotally connected adjacent its end to said first link,

drapery support means on each of said links,

each of said links including an elongated, generally rectangular body portion,

a pair of projections extending from the end of said first link,

a male post supported between said projections,

a female hinge part lying transverse to and being supported on the end of said second link,

said female hinge part opening in a direction away from the body portion of said second link and pivotally receiving said male post,

a second pair of projections extending from the end of said second link independently of said female hinge part and said projections facing said opening of said female hinge part, and

said first pair of projections being aligned with and contacting said second pair of projections to hold said male post and female hinge part assembled and to limit pivotal movement of the first link with respect to the second link.

10. An accordian linkage for a drapery support as defined in claim **9**, in which said second pair of projections have abutting surfaces in a plane angularly disposed with respect to the body of said second link, and in which said projections on the end of said first link have circular portions with the axis of the male post forming the center thereof whereby said circular portions of said projections on the first link roll on the abutting surfaces of said second pair of projections on the second link.

11. An accordian linkage as claimed in claim **9** wherein said drapery support means on each link comprises a single dovetail slot formed in one side wall of the body portion of each link.

12. An accordian linkage for a drapery support comprising,

a first link,

a second link pivotally connected to said first link,

drapery support means on each of said links,

said drapery support means comprising a single elongate drapery support member on one side of each of said links,

a pair of projections extending from the end of said first link and having a pair of abutment surfaces lying in a plane substantially parallel to the plane of said first link,

a male post supported between said pair of projections,

a female hinge part formed integrally with said second link and projecting transverse to the body of said second link,

a male receiving portion formed on the outer end of said female hinge part,

said male receiving portion of said female hinge part facing axially away from the second link,

a pair of projections on said second link engaging with a portion of the pair of projections on the first link to pivotally secure the female hinge part in position relative to the male post, and

said abutment surfaces on the first link abutting the projections on the second link to limit the angle of separation between said links.

13. The accordian linkage for a drapery support as claimed in claim **12** wherein said projections on the second link have abutting surfaces lying in a plane forming an acute angle with respect to said second link, and

said portions of said projections on said first link are circular in shape and position said male post equidistance from the abutting surfaces on said projections on the second link as the male post is guided into assembled relationship and guide said second link for pivoting motion about the axis of the male post.

14. The accordian linkage for a drapery support as claimed in claim **13** wherein each link has an elongate body portion in which said drapery support member is formed and wherein said drapery support member is a dovetail slot formed in said body portion.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,928,890

DATED : December 30, 1975

INVENTOR(S) : George H. Baker, Sr.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the drawings, Sheet 1, Fig. 1, the shade lines should be removed from the open area between the male post 37 and the edge of the link 11. Fig. 2, the shade lines should be removed from the open area between the male post 37 and the edge of the link. Sheet 2, Fig. 4, an arrowhead should be placed on the lead line from numeral 120. Fig. 5, the reference numeral 120 and lead line on the upper portion of the view next to reference numeral 134 should be removed; the reference numeral 122 at the lower left of the figure should be changed to the numeral 120 and an arrowhead should be added to the lead line; and the lead line from reference numeral 122 at the lower right of the figure should be extended beyond the lower edge of the flat portion of the part. Fig. 6, the lead line from numeral 120 should be shortened and an arrowhead placed thereon; the lead line from numeral 124 should be changed to a dashed line from the present solid line; and the reference numeral 124 at the bottom center of the figure should be changed to 126. Fig. 7, the reference numeral 114 and the lead line therefrom should be deleted. Fig. 8, the lead line from numeral 120 should have an arrowhead placed on the end thereof; the reference numeral 124 on the right of the view should be changed to 126; and the lead line from numeral 128 should be extended to the curve in the end of part 126.

Column 3, line 63, cancel "lower". Column 4, line 34, "force" should be --forces--; line 55, cancel "therefore". Column 5, line 60, "4" should read --5--; line 61, "member" should read --segment--.

Signed and Sealed this

Twelfth Day of April 1977

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks