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[54] **AUTO BODY BENCH** 4,880,194 11/1989 Geise et al. 269/901

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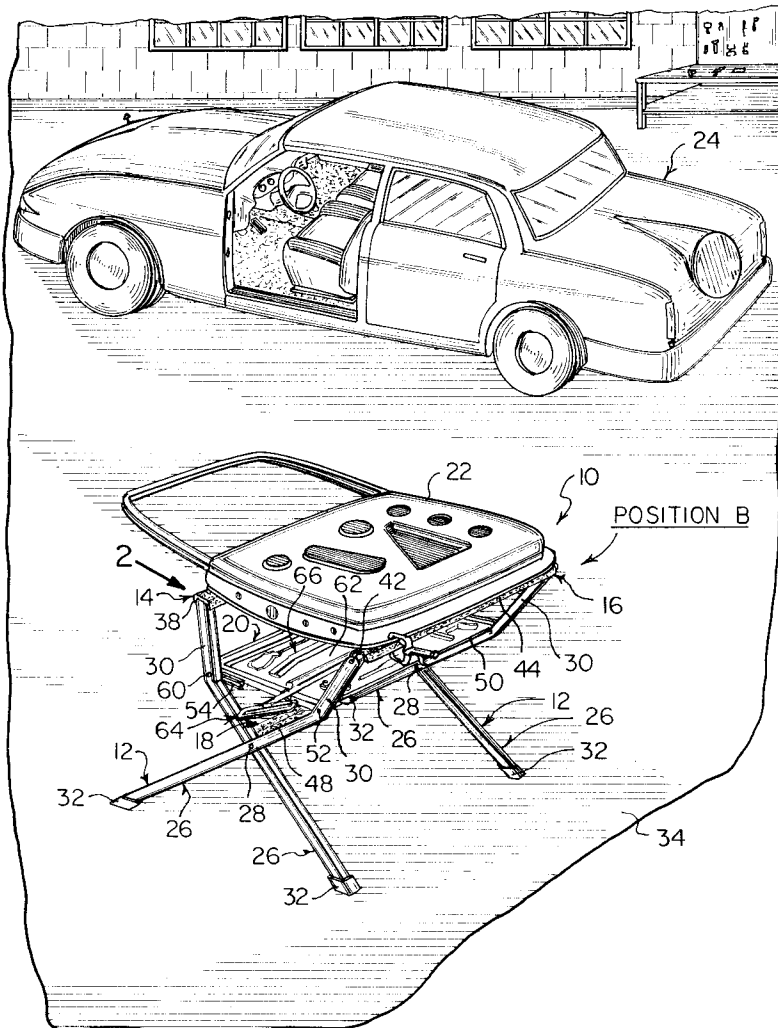
[57] ABSTRACT

[51] **Int. Cl.**⁶ **B21D 01/12**
[52] **U.S. Cl.** **72/458; 72/705; 248/166;**
269/901
[58] **Field of Search** 72/458, 705; 108/117,
108/124, 133; 248/162.1, 166, 432; 269/901,
905

An auto body bench (10) comprises a pair of scissor type leg assemblies (12). A first structure (14) is for connecting a first top end of each scissor type leg assembly (12) together. A second structure (16) is for connecting a second top end of each scissor type leg assembly (12) together. A facility (18) is for applying a twisting action between the scissor type leg assemblies (12). A system (20) is for adjusting the scissor type leg assemblies (12) between a closed collapsible position "A" to an opened useable position "B", so that the first connecting structure (14) and the second connecting structure (16) will support thereon a damaged small auto body part (22) removed from an automobile (24).

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24 Claims, 5 Drawing Sheets



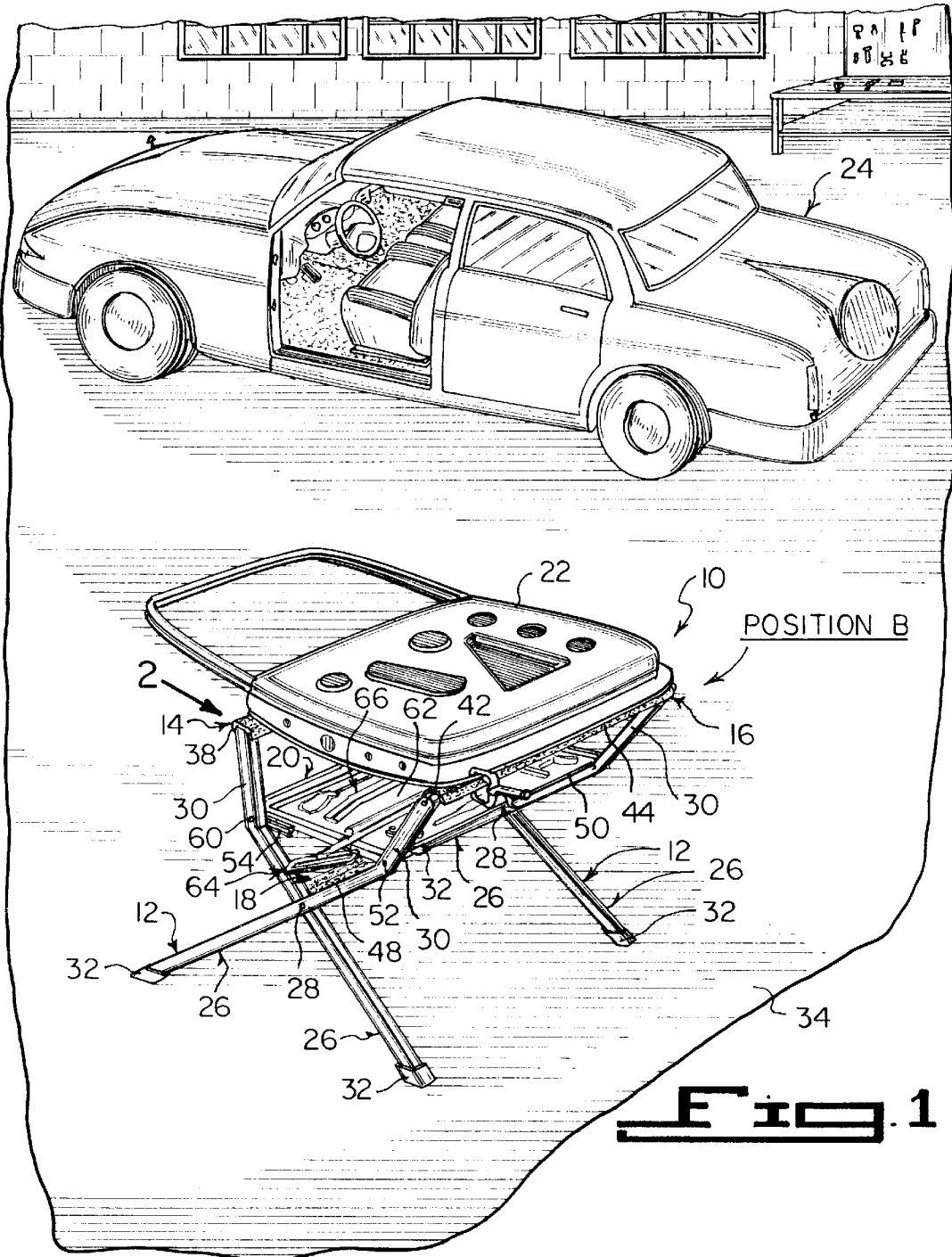


Fig. 2

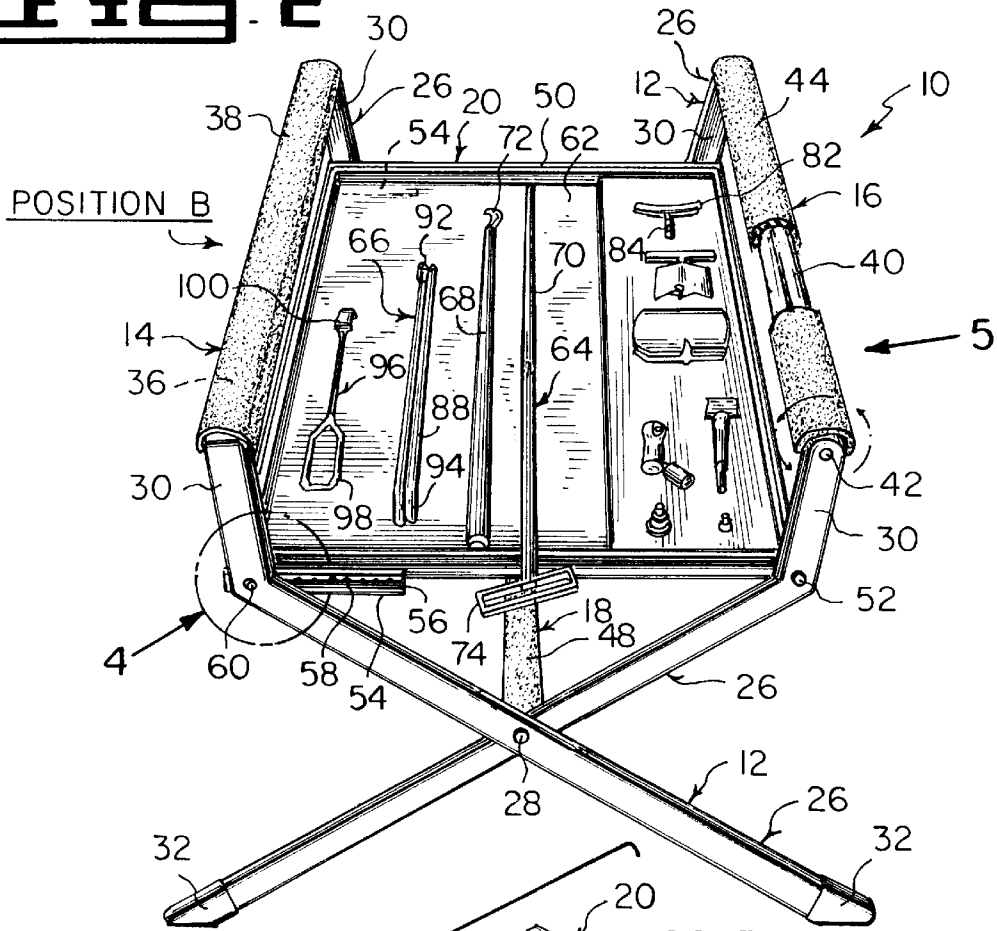


Fig. 3

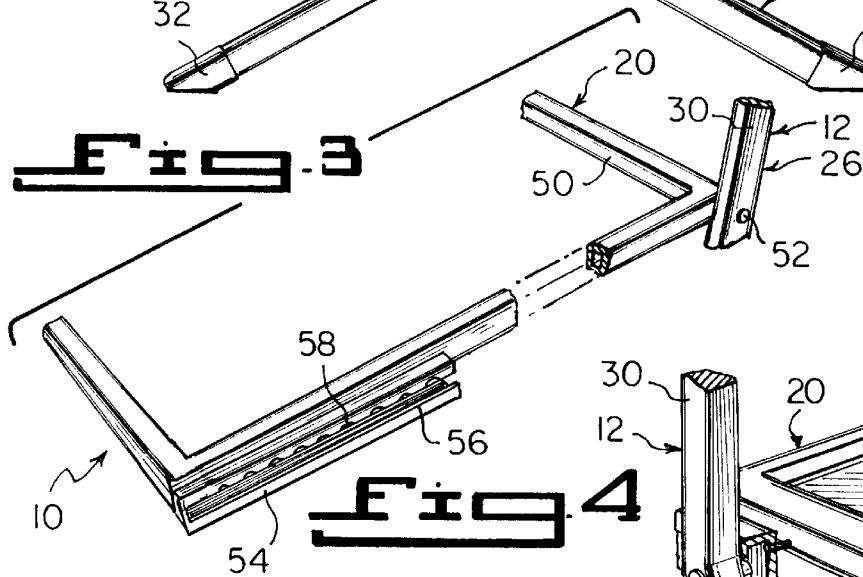
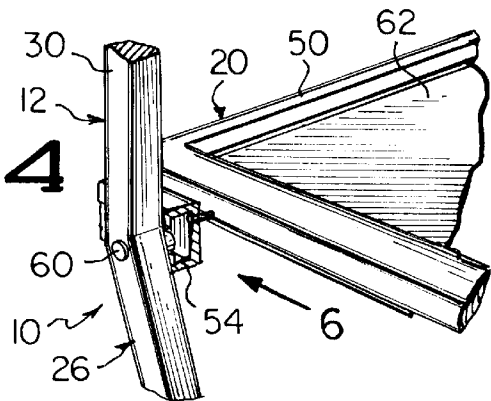


Fig. 4



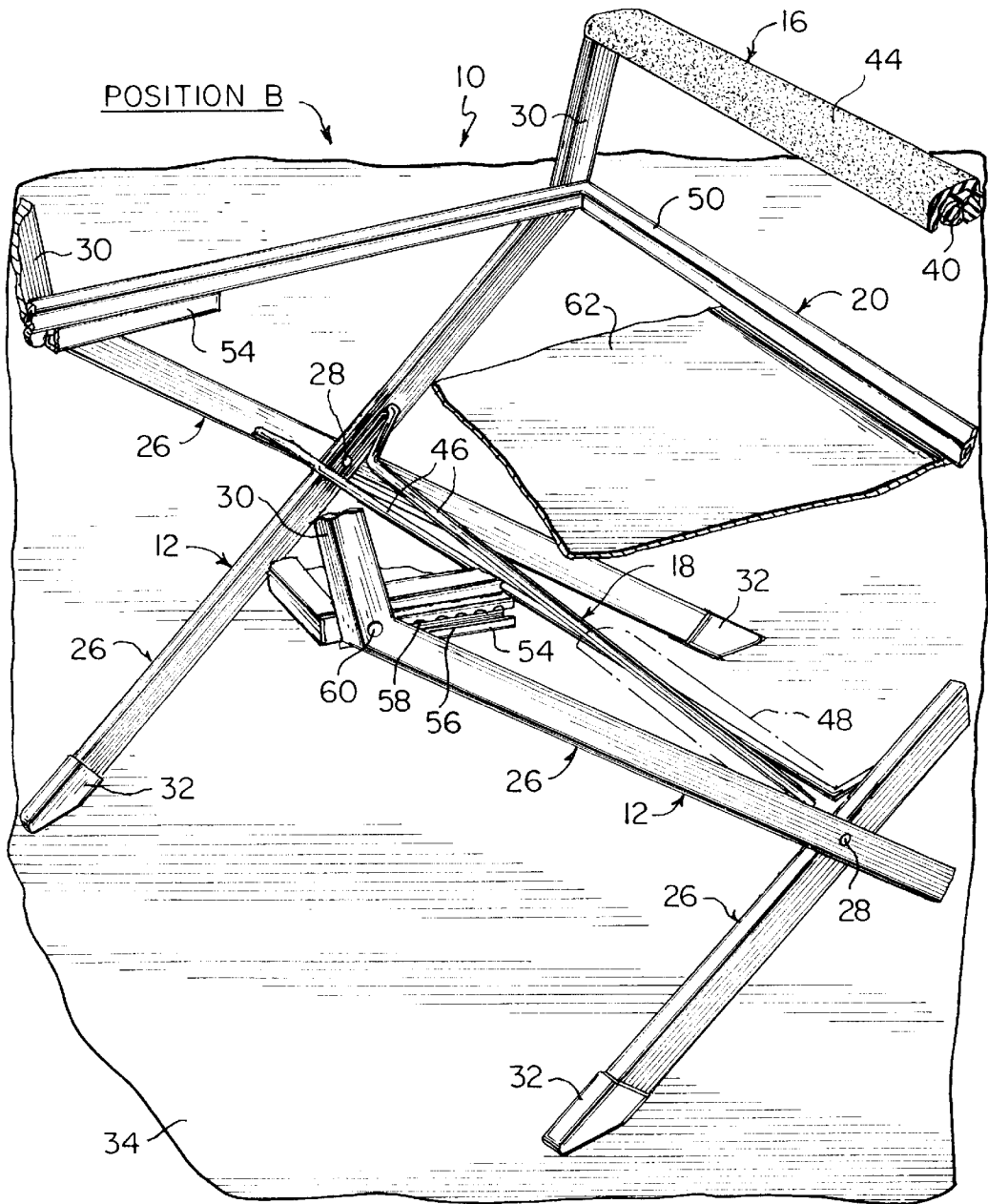
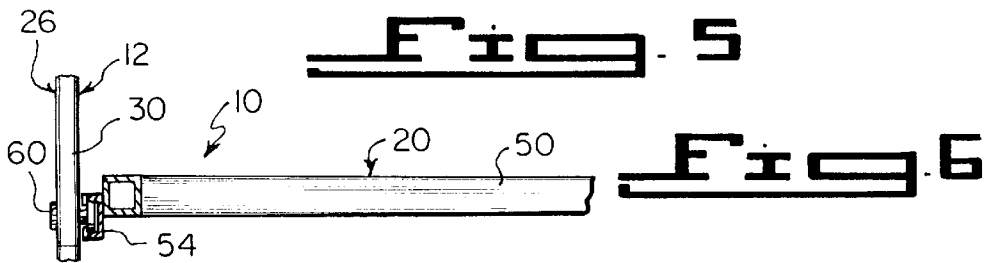


Fig. 5



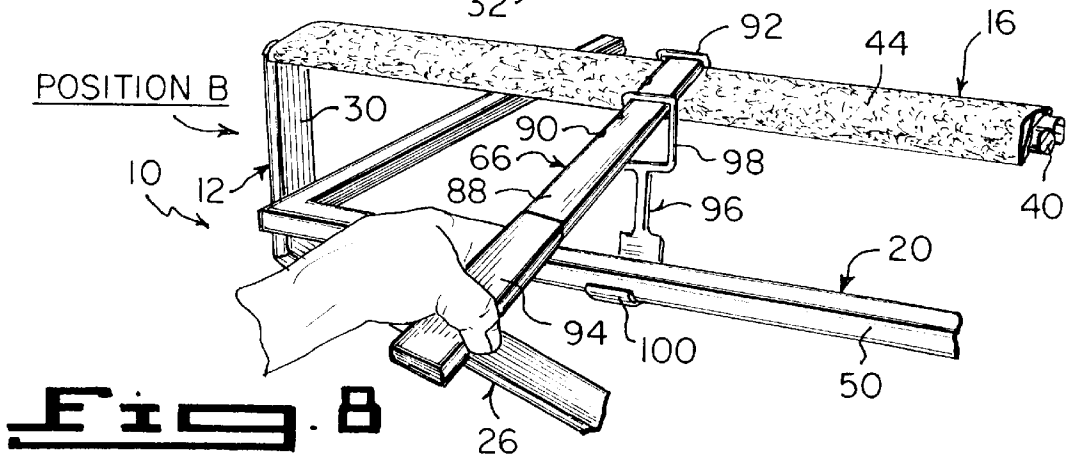
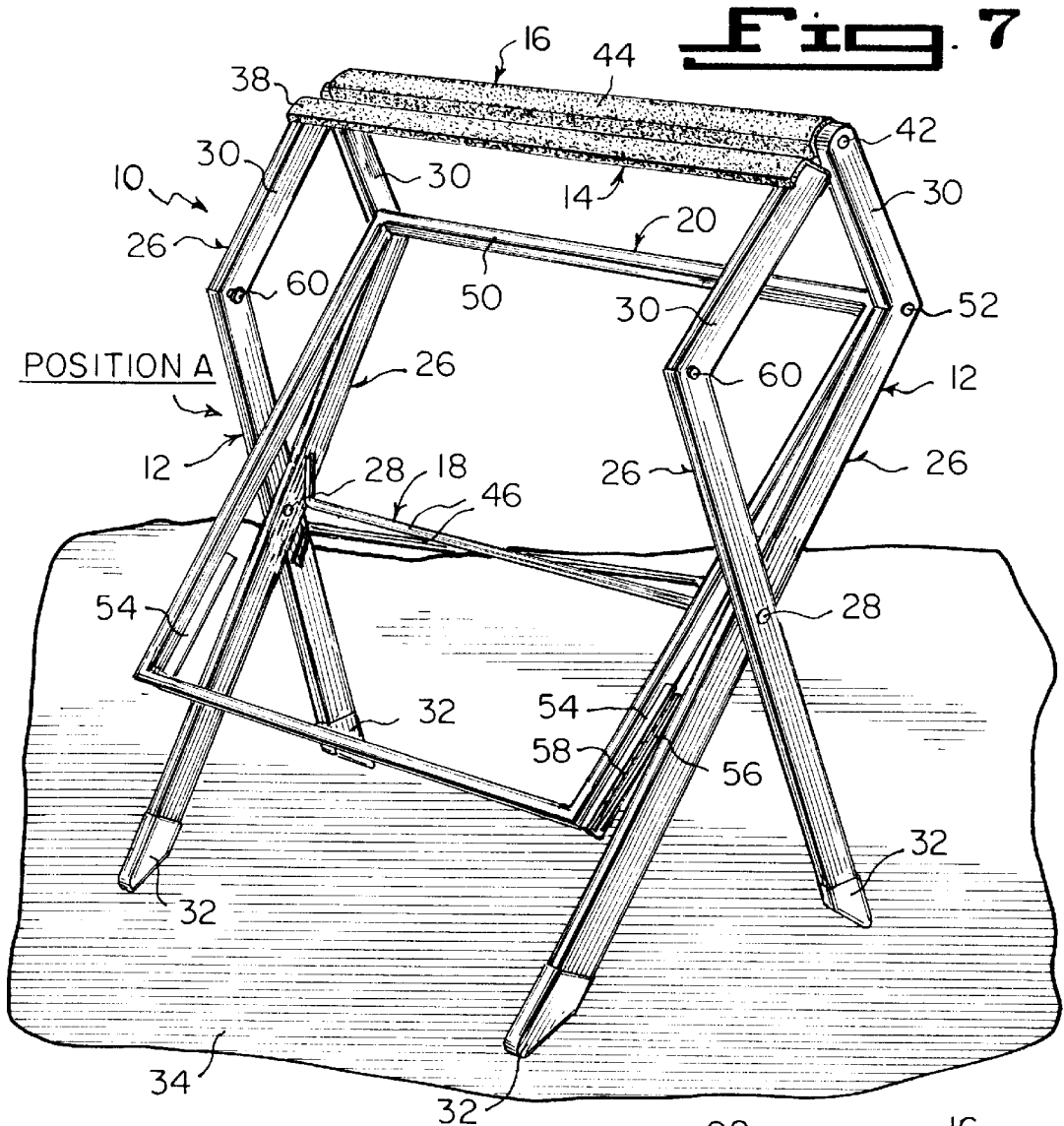


FIG. 9

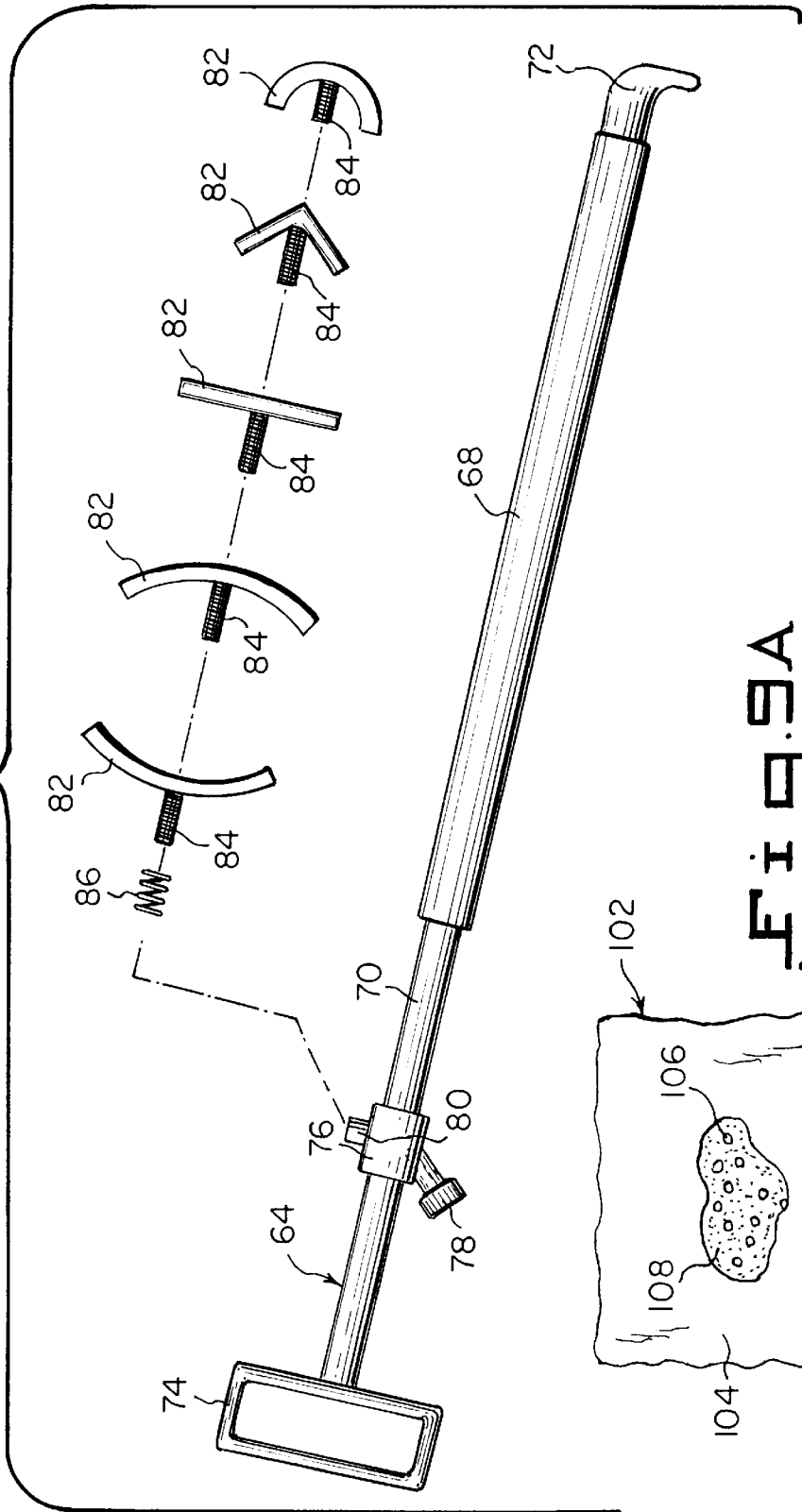


FIG. 9A

AUTO BODY BENCH**BACKGROUND OF THE INVENTION**

1. Field of the Invention

The instant invention relates generally to workbenches and more specifically it relates to an auto body bench. The auto body bench is a collapsible, adjustable, scissor leg type bench having a foldable tray with a pry bar and leverage bar, accommodated with clamps and hammers, to perform a task or procedure called skinning a door, in which a damaged outer door panel is replaced with a new one. The auto body bench is designed for car doors, but can be also used for a variety of functions in an auto body shop, so as to replace the standard workbench now in use.

2. Description of the Prior Art

Almost all automobiles involved in a side collision will have door damage. Often, the inner door panels will be undamaged or will have only minor damage that may be easily straightened. The outer panel of a door is also known in the auto body trade as the door skin, or simply skin. This is the outside surface of the door.

In the auto body industry there is a procedure called skinning a door, where when the outside cosmetic skin being damaged is peeled off and a new one is attached in its place. The new panel or skin has a half inch flange on its perimeter which is folded in and crimped tight, so that it adheres to the old door shell or main frame.

Replacing an outer door panel is a common replacement job done in a body shop. If the skin is damaged to a great extent, it is almost always replaced. Door skins are about the easiest panels to replace. When the labor charge to straighten a door skin would amount to three or four hours, it would probably be less expensive to replace the panel with a new skin.

Generally, door skins are inexpensive. They can be quickly installed, when compared to an entirely new door. A new skin gives the appearance of a new door. Also, the skin can often be installed without removing the inner working parts of the door or window glass. However, the inside trim panel may need to be removed. The outer door handle is usually bolted to the door skin from the inside. Since only the outer panel is damaged, a new skin will be installed. This will save the time required to work out the damage.

Presently this task is accomplished on a variety of standard workbenches or work areas. The folding and crimping process is done by various hammers and dollies or blocks and leave the technician to wrestle with the door, while performing this awkward procedure. The standard workbench is usually used to work on smaller parts that have been removed from the car. By using the standard workbench, the parts are held at waist level, high enough to be easily worked on. The standard workbench is strong, stable, and made of steel, but is non-collapsible. A stationary shelf can be mounted beneath the standard workbench to store smaller tools, such as a tap and die set or electric drills, but cannot be folded up. While these units may be suitable for the particular purpose to which they address, they would not be as suitable for the purposes of the present invention as heretofore described.

SUMMARY OF THE INVENTION

A primary object of the present invention is to provide an auto body bench that will overcome the shortcomings of the prior art devices.

Another object is to provide an auto body bench that is a collapsible, adjustable, scissor leg type bench having a

foldable tray with a pry bar and leverage bar, accommodated with clamps and hammer to perform a task or procedure called skinning a door, in which a damaged outer door panel is replaced with a new one.

An additional object is to provide an auto body bench that is designed for car doors, but can be also used for a variety of functions in an auto body shop, so as to replace the standard workbench now in use.

A further object is to provide an auto body bench that is simple and easy to use.

A still further object is to provide an auto body bench that is economical in cost to manufacture.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

Various other objects, features and attendant advantages of the present invention will become more fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein;

FIG. 1 is a front perspective view of the present invention in an opened position and in use in an auto body shop.

FIG. 2 is a side perspective view of the present invention per se, with parts broken away and in section, taken in the direction of arrow 2 in FIG. 1.

FIG. 3 is an enlarged side perspective view with parts broken away and in section, showing a portion of the box-shaped framework and one of the guide members in greater detail.

FIG. 4 is an enlarged perspective view of an area in FIG. 2 as indicated by arrow 4.

FIG. 5 is a further enlarged side perspective view with parts broken away and in section, taken in the direction of arrow 5 in FIG. 2.

FIG. 6 is an elevational view with parts shown in section, taken in the direction of arrow 6 in FIG. 4 with the tray removed.

FIG. 7 is a front perspective view of the present invention in a closed collapsed position with parts and the tray removed.

FIG. 8 is a perspective view of the pry bar in use.

FIG. 9 is a plan view of the leverage bar, showing various blocks exploded therefrom.

FIG. 9A is a plan view of the shot bag with parts broken away.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. 1 through 8 illustrate the present invention being an auto body bench 10. With

regard to the reference numerals used, the following numbering is used throughout the various drawing figures.

- A closed collapsible position of **10**
- B opened useable position of **10**
- 10** auto body bench
- 12** scissor type leg assembly of **10**
- 14** first connecting structure of **10**
- 16** second connecting structure of **10**
- 18** twisting facility of **10**
- 20** adjusting system of **10**
- 22** damaged small auto body part of **24**
- 24** automobile
- 26** leg of **12**
- 28** pivot pin of **12**
- 30** bent top portion of **26**
- 32** foot on **26**
- 34** floor
- 36** crossbar of **14**
- 38** pad of **14** on **36**
- 40** anvil bar of **16**
- 42** anvil bar axle pin of **16**
- 44** pad of **16** on **40**
- 46** torsion bar of **18**
- 48** pad of **18** on **46**
- 50** box-shaped framework of **20**
- 52** framework axle pin of **20**
- 54** guide member of **20**
- 56** longitudinal slot in **54**
- 58** upper notch in **56**
- 60** guide pin of **20**
- 62** tray of **20** on **50**
- 64** leverage bar of **10**
- 66** pry bar of **10**
- 68** tubular member of **64**
- 70** shaft of **64**
- 72** hook member of **64** on **68**
- 74** handle of **64** on **70**
- 76** receiver sleeve of **64**
- 78** bolt of **64** in **76**
- 80** collar of **64** on **76**
- 82** block of **64**
- 84** shank on **82**
- 86** optional spacer/spring of **64**
- 88** arm of **66**
- 90** notch in **88**
- 92** foot of **66** on **88**
- 94** handle of **66** on **88**
- 96** link member of **66**
- 98** loop end of **96**
- 100** hook end of **96**

The auto body bench **10** comprises a pair of scissor type leg assemblies **12**. A first structure **14** is for connecting a first top end of each scissor type leg assembly **12** together. A second structure **16** is for connecting a second top end of each scissor type leg assembly **12** together. A facility **18** is for applying a twisting action between the scissor type leg assemblies **12**. A system **20** is for adjusting scissor type leg assemblies **12** between a closed collapsible position "A" to

an opened useable position "B", so that the first connecting structure **14** and the second connecting structure **16** will support thereon a damaged small auto body part **22** removed from an automobile **24**.

- 5 Each scissor type leg assembly **12** consists of a pair of legs **26**, having about a midway crossing point. A pivot pin **28** extends through the midway crossing point of the legs **26**. Each leg **26** contains a bent top portion **30** and a foot **32** on a lower end to stabilize the leg **26** upon a floor **34**.
- 10 The first connecting structure **14** includes a crossbar **36** and a pad **38** to cover the crossbar **36**, so as to protect the damaged small auto body part **22** placed thereon. The second connecting structure **16** consists of an anvil bar **40**. A pair of anvil bar axle pins **42** are for joining the anvil bar **40** in a rotational adjustable manner to the second top ends of the scissor type leg assemblies **12**. A pad **44** covers the anvil bar **40** for procedures other than skinning, so as to protect the damaged small auto body part **22** placed thereon, when hammered and crimped.
- 20 The twisting facility **18** contains a pair of torsion bars **46** extending about midway across and connected between the scissor type leg assemblies **12**. When the scissor type leg assemblies **12** are placed in the opened useable position "B", the torsion bars **46** will counter the inertia. A pad **48** covers the torsion bars **46**.
- 25 The adjusting system **20** includes a box-shaped framework **50**. A pair of framework axle pins **52** are for pivotally connecting one side of the box-shaped framework **50** about three quarters the way up between the scissor type leg assemblies **12**. A pair of guide members **54** are attached to lower sides of the box-shaped framework **50** opposite from the framework axle pins **52**. Each guide member **54** has a longitudinal slot **56** with a plurality of spaced apart upper notches **58**. A pair of guide pins **60** are mounted about three
- 30 quarters the way up on the scissor type leg assemblies **12** opposite from the framework axle pins **52**. The guide pins **60** will slide in the slots **56** and lock into a choice of the upper notches **58** in the guide members **54**, to accommodate different sized damaged small auto body parts **22**. A tray **62** is connected to the box-shaped framework **50**, for holding various tools needed for doing auto body repair work.
- 40 The auto body bench **10** further comprises a leverage bar **64** to engage with the box-shaped framework **50**, to bear against the underside of the damaged small auto body part **22** which is being hammered. A pry bar **66** will engage with the second connecting structure **16** to serve as a crimper.
- 45 The leverage bar **64**, as best seen in FIG. 9, includes a tubular member **68**. A shaft **70** telescopically slides within the tubular member **68**. A hook member **72** on a forward end of the tubular member **68** will engage with and slide upon the side opposite from the side of the box-shaped framework **50**, with the framework axle pins **52**. A handle **74** is on the shaft **70**, to manually manipulate the leverage bar **64**. A receiver sleeve **76** is provided, to slide anywhere upon the shaft **70**. A bolt **78** in the receiver sleeve **76** locks the receiver sleeve **76** in place upon the shaft **70**. A collar **80** is on the receiver sleeve **76**. A block **82** is provided, having a shank **84**. An optional spacer/spring **86** can fit over the shank **84** of the block **82**, when the shank **84** is inserted into the collar **80**, so as to allow the block **82** to bear against the damaged small auto body part **22**. The block **82** can come in a variety of sizes, shapes and materials, to bear against different types of damaged small auto body parts **22**.
- 50 The pry bar **66**, as best seen in FIG. 8, consists of an arm **88** having a plurality of notches **90** along one side thereof. A foot **92** is on a forward end of the arm **88** which extends over the second connecting means **16**, to crimp a replace-

ment skin on the small auto body part **22**. A handle **94** is on a reward end of the arm **88**, to manually operate the pry bar **66**. A link member **96** is provided, having a loop end **98** and a hook end **100**. The loop end **98** fits over the arm **88** in an adjustable manner, to engage with any one of the notches **90** on the arm **88**, while the hook end **100** engages with the side of the box-shaped framework **50** with the framework axle pins **52**.

FIG. 9A shows a shot bag **102** used between the block **82** and the damaged small auto body part **22**, to conform to the more particular areas that the block **82** may not each. The shot bag **102** is made out of industrial fabric/rubber **104** and filled with small pellets **106** and sand **108**.

It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

While certain novel features of this invention have been shown and described are pointed out in the annexed claims, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed is new and desired to be protected by Letters Patent is set forth in the appended claims:

1. An auto body bench comprising:

- a) a pair of scissor type leg assemblies;
- b) means for connecting a first top end of each said scissor type leg assembly together;
- c) means for connecting a second top end of each said scissor type leg assembly together;
- d) means for applying a twisting action between said scissor type leg assemblies; and
- e) means for adjusting said scissor type leg assemblies between a closed collapsible position to an opened useable position, so that said first connecting means and said second connecting means will support thereon a damaged small auto body part removed from an automobile,

wherein said twisting means includes:

- i) a pair of torsion bars extending about midway across and connected between said scissor type leg assemblies, so that when said scissor type leg assemblies are placed in the opened useable position, said torsion bars will counter the inertia; and
- ii) a pad to cover said torsion bars.

2. An auto body bench as recited in claim **1**, wherein each said scissor type leg assembly includes a pair of legs having about a midway crossing point and a pivot pin extending through said midway crossing point of said legs.

3. An auto body bench as recited in claim **2**, wherein each said leg includes:

- a) a bent top portion; and
- b) a foot on a lower end to stabilize said leg upon a floor.

4. An auto body bench as recited in claim **3**, wherein said first connecting means includes:

- a) a crossbar; and
- b) a pad to cover said crossbar, so as to protect the damaged small auto body part placed thereon.

5. An auto body bench as recited in claim **4**, wherein said second connecting means includes:

- a) an anvil bar;
- b) a pair of anvil bar axle pins for joining said anvil bar in a rotational adjustable manner to the second top ends of said scissor type leg assemblies; and
- c) a pad to cover said anvil bar for procedures other than skinning, so as to protect the damaged small auto body part placed thereon, when hammered and crimped.

6. An auto body bench as recited in claim **5**, wherein said twisting means includes:

- a) a pair of torsion bars extending about midway across and connected between said scissor type leg assemblies, so that when said scissor type leg assemblies are placed in the opened useable position, said torsion bars will counter the inertia; and
- b) a pad to cover said torsion bars.

7. An auto body bench as recited in claim **6**, wherein said adjusting means includes:

- a) a box-shaped framework;
- b) a pair of framework axle pins for pivotally connecting one side of said box-shaped framework about three quarters the way up between said scissor type leg assemblies;
- c) a pair of guide members attached to lower sides of said box-shaped framework opposite from said framework axle pins, each said guide member having a longitudinal slot with a plurality of spaced apart upper notches; and
- d) a pair of guide pins mounted about three quarters the way up on said scissor type leg assemblies opposite from said framework axle pins, whereby said guide pins will slide in said slots and lock into a choice of said upper notches in said guide members to accommodate different sized damaged small auto body parts.

8. An auto body bench as recited in claim **7**, wherein said adjusting means further includes a tray connected to said box-shaped framework, for holding various tools needed for doing auto body repair work.

9. An auto body bench as recited in claim **8**, further including:

- a) a leverage bar to engage with said box-shaped framework to bear against the underside of the damaged small auto body part which is being hammered; and
- b) a pry bar to engage with said second connecting means to serve as a crimper.

10. An auto body bench as recited in claim **9**, wherein said leverage bar includes:

- a) a tubular member;
- b) a shaft which telescopically slides within said tubular member;
- c) a hook member on a forward end of said tubular member to engage with and slide upon the side opposite from the side of said box-shaped framework with said framework axle pins;
- d) a handle on said shaft to manually manipulate said leverage bar;
- e) a receiver sleeve which slides anywhere upon said shaft;
- f) a bolt in said receiver sleeve to lock said receiver sleeve in place upon said shaft;
- g) a collar on said receiver sleeve;
- h) a block having a shank; and
- i) an optional spacer/spring to fit over the threaded shank of said block, when said shank is inserted into said

collar, so as to allow said block to bear against the damaged small auto body part.

11. An auto body bench as recited in claim 10, wherein said block can come in a variety of sizes, shapes and materials to bear against different types of damaged small auto body parts.

12. An auto body bench as recited in claim 11, wherein said pry bar includes:

- a) an arm having a plurality of notches along one side thereof;
- b) a foot on a forward end of said arm which extends over said second connecting means, to crimp a replacement skin on the small auto body part;
- c) a handle on a rearward end of said arm to manually operate said pry bar; and
- d) a link member having a loop end and a hook end, whereby said loop end fits over said arm in an adjustable manner to engage with any one of said notches on said arm, while said hook end engages with the side of said box-shaped framework with said framework axle pins.

13. An auto body bench as recited in claim 10, further including a shot bag used between said block and the damaged small auto body part, to conform to the more particular areas that said block may not reach, wherein said shot bag is made out of industrial fabric/rubber and filled with small pellets and sand.

14. An auto body bench comprising:

- a) a pair of scissor type leg assemblies;
- b) means for connecting a first top end of each said scissor type leg assembly together;
- c) means for connecting a second top end of each said scissor type leg assembly together;
- d) means for applying a twisting action between said scissor type leg assemblies; and
- e) means for adjusting said scissor type leg assemblies between a closed collapsible position to an opened useable position so that said first connecting means and said second connecting means will support thereon a damaged small auto body part removed from an automobile wherein said adjusting means includes:
 - i) a box shaped framework;
 - ii) a pair of framework axle pins for pivotally connecting one side of said box-shaped framework about three quarters the way up between said scissor type leg assemblies;
 - iii) a pair of guide members attached to lower sides of said box-shaped framework opposite from said framework axle pins, each said guide member having a longitudinal slot with a plurality of spaced apart upper notches; and
 - iv) a pair of guide pins mounted about three quarters the way up on said scissor type leg assemblies opposite from said framework axle pins, whereby said guide pins will slide in said slots and lock into a choice of said upper notches in said guide members to accommodate different sized damaged small auto body parts.

15. An auto body bench as recited in claim 14, wherein each said scissor type leg assembly includes:

- a) a pair of legs having about a midway crossing point; and
- b) a pivot pin extending through said midway crossing point of said legs.

16. An auto body bench as recited in claim 15, wherein each said leg includes:

a) a bent top portion; and

b) a foot on a lower end to stabilize said leg upon a floor.

17. An auto body bench as recited in claim 14, wherein said first connecting means includes:

- a) a crossbar; and
- b) a pad to cover said crossbar, so as to protect the damaged small auto body part placed thereon.

18. An auto body bench as recited in claim 14, wherein said second connecting means includes:

- a) an anvil bar;
- b) a pair of anvil bar axle pins for joining said anvil bar in a rotational adjustable manner to the second top ends of said scissor type leg assemblies; and
- c) a pad to cover said anvil bar for procedures other than skinning, so as to protect the damaged small auto body part placed thereon, to be hammered and crimped.

19. An auto body bench as recited in claim 14, wherein said adjusting means further includes a tray connected to said box-shaped framework, for holding various tools needed for doing auto body repair work.

20. An auto body bench as recited in claim 14, further including:

- a) a leverage bar to engage with said box-shaped framework to bear against the underside of the damaged small auto body part which is being hammered; and
- b) a pry bar to engage with said second connecting means to serve as a crimper.

21. An auto body bench as recited in claim 20, wherein said leverage bar includes:

- a) a tubular member;
- b) a shaft which telescopically slides within said tubular member;
- c) a hook member on a forward end of said tubular member to engage with and slide upon the side opposite from the side of said box-shaped framework with said framework axle pins;
- d) a handle on said shaft to manually manipulate said leverage bar;
- e) a receiver sleeve which slides anywhere upon said shaft;
- f) a bolt in said receiver sleeve to lock said receiver sleeve in place upon said shaft;
- g) a collar on said receiver sleeve;
- h) a block having a shank; and
- i) an optional spacer/spring to fit over the shank of said block, when said shank is inserted into said collar, so as to allow said block to bear against the damaged small auto body part.

22. An auto body bench as recited in claim 21, wherein said block can come in a variety of sizes and shapes and materials to bear against different types of damaged small auto body parts.

23. An auto body bench as recited in claim 21, further including a shot bag used between said block and the damaged small auto body part, to conform to the more particular areas that said block may not reach, wherein said shot bag is made out of industrial fabric/rubber and filled with small pellets and sand.

24. An auto body bench as recited in claim 20, wherein said pry bar includes:

- a) an arm having a plurality of notches along one side thereof;
- b) a foot on a forward end of said arm which extends over said second connecting means, to crimp a replacement skin on the small auto body part;

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- c) a handle on a reward end of said arm to manually operate said pry bar; and
- d) a link member having a loop end and a hook end, whereby said loop end fits over said arm in an adjustable manner to engage with any one of said notches on

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said arm, while said hook end engages with the side of said box-shaped framework with said framework axle pins.

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