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Wood material cutting auxiliary device

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(56) Related Art
US 5937924
GB 2270027
US 4265284

ABSTRACT OF THE DISCLOSURE

A wood material cutting auxiliary device includes a workbench (100), an adjusting shank (200) pivotally mounted on the bottom of the workbench, an adjusting ring (270) rotatably mounted on the adjusting shank, a fixing piece (290) for retaining the adjusting ring, and a saw frame (300) slidably mounted on the adjusting ring. In such a manner, the adjusting shank can be rapidly positioned on the workbench by provision of the positioning portion (112) on the bottom of the workbench, thereby facilitating adjusting the relative angle between the adjusting shank and the workbench. In addition, the saw frame can be used for cutting the wood material in a parallel manner or in an inclined manner by provision of the boss (321) in the slide base (320).

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

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Invention Title:	Wood Material Cutting Auxiliary Device

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

WOOD MATERIAL CUTTING AUXILIARY DEVICE

Field of the Invention

The present invention relates to a wood material cutting auxiliary device.

Description of the Related Art

A conventional angle adjustable wood material cutting device in accordance with the prior art can be used in the home and comprises a workbench having two ends each provided with an adjusting portion, and two circular bars secured in the positioning portion. However, the circular bars are pressed by an oil pressure machine to be secured in the fixing portion, thereby easily breaking the parts of the cutting device. In addition, the circular bars are not perpendicular to the workbench so that an inclined angle is defined between the wood material to be cut and the cutting blade of the cutting device, thereby decreasing the precision of the cutting device. Further, the workbench is easily cut by the cutting blade of the cutting device, thereby effecting the aesthetic quality of the workbench.

Object of the Invention

It is an object of the present invention to overcome or ameliorate some of the disadvantages of the prior art, or at least to provide a useful alternative.

Summary of the Invention

In accordance with one preferred embodiment of the present invention, there is provided a wood material cutting auxiliary device comprising a workbench, an adjusting shank, an adjusting ring, a fixing piece, and a saw frame, wherein,

the workbench has a bottom provided with a positioning portion defining a plurality of long slots and a locking portion defining a plurality of positioning slots, a hexagonal hole defined in a top of the workbench, the

workbench includes a first side integrally formed with two opposite pieces to form a retaining portion defining a cut and a second side defining two side holes, a washer secured in the cut;

the adjusting shank has two ends each provided with a fixing portion defining a plurality positioning holes and having a periphery defining a plurality of semi-circular grooves, an annular piece integrally formed on a mediate portion of the adjusting shank and defining a circular hole, a locking hole defined in the adjusting shank and located adjacent to the annular piece, a spring, a ball and a hollow sealing block in turn received in the locking hole, a threaded block screwed into a bottom of the locking hole, an elongated slot defined in the adjusting shank and located adjacent to the locking hole, a locking block received in the elongated slot and having a top integrally formed with a positioning block and two sides each defining a press slot, a cone-shaped hole defined in the adjusting shank and located adjacent to the elongated slot, an indication block received in the cone-shaped hole, an adjusting bar in turn extending through the indication block, the locking block and the threaded block;

the adjusting ring has a bottom defining a receiving hole for receiving a positioning ball and a spring, a screw screwed into a bottom of the receiving hole, the adjusting ring has a top defining two fixing holes, two circular bars each secured in each of the two fixing holes, two L-shaped press pieces each secured in each of the two fixing holes for securing the circular bar in the fixing hole, the adjusting ring has one side defining an arcuate slot which has two sides each defining a plurality of circular holes;

the fixing piece includes a first side integrally formed with an arcuate rib and a second side defining therein three threaded bores and two positioning holes; and

the saw frame has two ends each provided with a locking portion, a U-shaped block secured on the locking portion, an adjusting bolt extending through the U-shaped block, two rectangular hollow slide bases each slidably mounted on the saw frame, each of the two slide bases including an inner wall integrally formed with a boss and an outer wall having two sides each integrally formed with two ribs, a T-shaped limiting base secured on a lower portion of the slide base and having two ends each defining a limiting hole, two elongated bars extending downward from a bottom of the limiting base to form a limiting portion, a limiting block integrally formed on one side of the limiting portion.

The present invention at least in a preferred embodiment provides a wood material cutting auxiliary device, wherein, the adjusting shank can be rapidly positioned on the workbench by provision of the positioning portion on the bottom of the workbench, thereby facilitating adjusting the relative angle between the adjusting shank and the workbench. In addition, when the wood material is cut by the saw frame, a smooth cutting face is formed on the wood material by provision of the washer which can also be used for protecting the workbench.

The present invention preferably provides a wood material cutting auxiliary device, wherein, the U-shaped block can be used for calibrating the center of the cutting blade of the saw frame.

The present invention yet further preferably provides a wood material cutting auxiliary device, wherein, the saw frame is moved linearly by provision of the slide base and the limiting base. In addition, the saw frame can be used for cutting the wood material in a parallel manner or in an inclined manner by provision of the boss in the slide base.

The present invention further preferably provides a wood material cutting auxiliary device, wherein, when the adjusting ring is rotated relative to the fixing portion of the adjusting shank, the adjusting ring can be rapidly positioned by provision of the positioning ball on the bottom of the adjusting ring.

The present invention still further preferably provides a wood material cutting auxiliary device, wherein, the adjusting shank can be rotated relative to the workbench smoothly by provision of the annular piece.

Brief Description of the Drawings

Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 is an exploded view of a wood material cutting auxiliary device in accordance with an embodiment of the present invention;

Fig. 2 is a perspective view of a fixing portion of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 3 is a perspective view of a positioning bolt of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 4 is a perspective view of a press piece of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 5 is a front plan view of an adjusting ring of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 6 is a partially exploded view of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 7 is a perspective assembly view of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 8 is a bottom perspective view of a workbench of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 9 is a front plan cross-sectional assembly view of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 10 is a side plan cross-sectional assembly view of a locking block of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 11 is a top plan assembly view of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 12 is a front plan cross-sectional assembly view of a saw frame of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 13 is a front plan cross-sectional assembly view of the saw frame of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 14 is a front plan view of the saw frame of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 15 is a front plan view of the saw frame of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 16 is an operational view of the saw frame of the wood material cutting auxiliary device as shown in Fig. 15;

Fig. 17 is a side plan cross-sectional view of the workbench of the wood material cutting auxiliary device as shown in Fig. 1;

Fig. 18 is a side plan assembly view of the wood material cutting auxiliary device as shown in Fig. 1; and

Fig. 19 is a perspective assembly view of the wood material cutting auxiliary device as shown in Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings and initially to Figs. 1-15, a wood material cutting auxiliary device in accordance with the present invention comprises a workbench 100, an adjusting shank 200 pivotally mounted on the bottom of the workbench 100, an adjusting ring 270 rotatably mounted on the adjusting shank 200, a fixing piece 290 for retaining the adjusting ring 270, and a saw frame 300 slidably mounted on the adjusting ring 270.

The workbench 100 includes a bottom provided with a positioning portion 112 defining a plurality of long slots 113 and a locking portion 111 defining a plurality of positioning slots 114 as shown in Fig. 8. A hexagonal hole 130 is defined in the top of the workbench 100. The workbench 100 includes a first side integrally formed with two opposite pieces to form a retaining portion 110 defining a cut 120 and a second side defining two side holes 140, and a washer 150 is secured in the cut 120.

The adjusting shank 200 has two ends each provided with a fixing portion 260 defining a plurality positioning holes 261 and having a periphery

defining a plurality of semi-circular grooves 262 as shown in Fig. 2. An annular piece 210 is integrally formed on the mediate portion of the adjusting shank 200 and defines a circular hole 220. A locking hole 230 is defined in the adjusting shank 200 and located adjacent to the annular piece 210. A spring 233, a ball 232 and a hollow sealing block 231 are in turn received in the locking hole 230. A threaded block 234 is screwed into the bottom of the locking hole 230. An elongated slot 240 is defined in the adjusting shank 200 and located adjacent to the locking hole 230. A locking block 241 is received in the elongated slot 240 and has a top integrally formed with a positioning block 243 and has two sides each defining a press slot 242. A cone-shaped hole 250 is defined in the adjusting shank 200 and located adjacent to the elongated slot 240. An indication block 251 is received in the cone-shaped hole 250. An adjusting bar 252 in turn extends through the indication block 251, the locking block 241 and the threaded block 234 as shown in Fig. 9. The press slot 242 is hit inward so as to secure the adjusting bar 252 in the locking block 241 as shown in Fig. 10.

The adjusting ring 270 has a bottom defining a receiving hole 273 for receiving a positioning ball 274 and a spring 233, and a screw 275 is screwed into the bottom of the receiving hole 273.

The adjusting ring 270 has a top defining two fixing holes 272. Two circular bars 281 are each secured in each of the two fixing holes 272. Each of the circular bars 281 is perpendicularly arranged relative to the adjusting shank 200 and the workbench 100. Two L-shaped press pieces 276 as shown in Fig. 4 are each secured in each of the two fixing holes 272 as shown in Fig. 5 for

securing the circular bar 281 in the fixing hole 272. The adjusting ring 270 has one side defining an arcuate slot 271 which has two sides each defining a plurality of circular holes 280.

The fixing piece 290 includes a first side integrally formed with an arcuate rib 291 and a second side defining three threaded bores 294 and two positioning holes 292.

The saw frame 300 has two ends each provided with a locking portion 310. A U-shaped block 311 is secured on the locking portion 310. An adjusting bolt 312 extends through the U-shaped block 311. Two rectangular hollow slide bases 320 are each slidably mounted on the saw frame 300. Each of the two slide bases 320 includes an inner wall integrally formed with a boss 321 and an outer wall having two sides each integrally formed with two ribs 322. A T-shaped limiting base 330 is secured on the lower portion of the slide base 320 and has two ends each defining a limiting hole 331. Two elongated bars each extend downward from a bottom of the limiting base 330 to form a limiting portion 332. A limiting block 333 is integrally formed on one side of the limiting portion 332.

The locking portion 310 of the saw frame 300 includes two sides each defining two opposite guide tracks 316 and an oblong slot 315 located between the two guide tracks 316. The U-shaped block 311 defines two locking holes 314. A fixing pin 313 in turn extends through the locking holes 314 and the oblong slot 315 so that the U-shaped block 311 is slidably mounted on the locking portion 310 of the saw frame 300 for adjusting the center of the cutting blade of the saw frame 300.

In assembly, referring to Figs. 1-19, the adjusting shank 200 is screwed onto the bottom of the workbench 100, and can be rotated relative to the workbench 100. The positioning block 243 of the locking block 241 is secured in the positioning portion 112 of the workbench 100, thereby securing the adjusting shank 200 on the bottom of the workbench 100.

The two adjusting rings 270 are then mounted on the two fixing portions 260 of the adjusting shank 200, and the two fixing pieces 290 are then screwed on the two fixing portions 260 of the adjusting shank 200. The arcuate rib 291 of the fixing piece 290 is secured in the arcuate slot 271 of the adjusting ring 270, thereby limiting the rotation of the adjusting ring 270 relative to the fixing piece 290. Two positioning bolts 293 each extend through the respective positioning hole 292 for securing the fixing piece 290 to the adjusting ring 270. When the adjusting ring 270 is rotated to adjust its angle, the positioning ball 274 is secured in the semi-circular groove 262 of the fixing portion 260 of the adjusting shank 200 for rapidly positioning the adjusting ring 270 on the fixing portion 260 of the adjusting shank 200. The circular bars 281 are then secured in the fixing holes 272 of the adjusting rings 270 by the press pieces 276.

The saw frame 300 is then mounted on the circular bars 281 with the slide bases 320 and the limiting bases 330 mounted between the circular bars 281 so that the saw frame 300 can only be moved linearly between the circular bars 281.

The saw frame 300 can be used for cutting the wood material in a parallel manner as shown in Fig. 15 or in an inclined manner as shown in Fig. 16 by provision of the boss 321 in the slide base 320.

When the wood material is secured on the workbench 100 to be cut by the saw frame 300 as shown in Fig. 19, the adjusting rings 270 can be rotated relative to the adjusting shanks 200 as shown in Fig. 18 so as to obtain a desired angle for cutting the wood material.

When the wood material is cut by the saw frame 300, a smooth cutting face is formed on the wood material by provision of the slide bases 320 and the limiting bases 330.

It should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

The claims defining the invention are as follows:

1. A wood material cutting auxiliary device comprising a workbench, an adjusting shank, an adjusting ring, a fixing piece, and a saw frame, wherein,

said workbench has a bottom provided with a positioning portion defining a plurality of long slots and a locking portion defining a plurality of positioning slots, a hexagonal hole defined in a top of said workbench, said workbench includes a first side integrally formed with two opposite pieces to form a retaining portion defining a cut and a second side defining two side holes, a washer secured in said cut;

said adjusting shank has two ends each provided with a fixing portion defining a plurality of positioning holes and having a periphery defining a plurality of semi-circular grooves, an annular piece integrally formed on a mediate portion of said adjusting shank and defining a circular hole, a locking hole defined in said adjusting shank and located adjacent to said annular piece, a spring, a ball and a hollow sealing block in turn received in said locking hole, a threaded block screwed into a bottom of said locking hole, an elongated slot defined in said adjusting shank and located adjacent to said locking hole, a locking block received in said elongated slot and having a top integrally formed with a positioning block and two sides each defining a press slot, a cone-shaped hole defined in said adjusting shank and located adjacent to said elongated slot, an indication block received in said cone-shaped hole, an adjusting bar in turn extending through said indication block, said locking block and said threaded block;

said adjusting ring has a bottom defining a receiving hole for receiving a positioning ball and a spring, a screw screwed into a bottom of said receiving hole, said adjusting ring has a top defining two fixing holes, two circular bars each secured in each of said two fixing holes, two L-shaped press pieces each secured in each of said two fixing holes for securing said circular bar in said fixing hole, said adjusting ring has one side defining an arcuate slot which has two sides each defining a plurality of circular holes;

said fixing piece includes a first side integrally formed with an arcuate rib and a second side defining three threaded bores and two positioning holes; and

said saw frame has two ends each provided with a locking portion, a U-shaped block secured on said locking portion, an adjusting bolt extending through said U-shaped block, two rectangular hollow slide bases each slidably mounted on said saw frame, each of said two slide bases including an inner wall integrally formed with a boss and an outer wall having two sides each integrally formed with two ribs, a T-shaped limiting base

secured on a lower portion of said slide base and having two ends each defining a limiting hole, two elongated bars extending downward from a bottom of said limiting base to form a limiting portion, a limiting block integrally formed on one side of said limiting portion.

2. The wood material cutting auxiliary device in accordance with claim 1, wherein said locking portion of said saw frame includes two sides each defining two opposite guide tracks and an oblong slot located between said two guide tracks, said U-shaped block defines two locking holes, and a fixing pin in turn extends through said locking holes and said oblong slot so that said U-shaped block is slidably mounted on said locking portion of said saw frame.

3. A wood material cutting auxiliary device substantially as hereinbefore described with reference to the accompanying drawings.

Dated 19 March, 2001
Tian-Shoei Wang
Patent Attorneys for the Applicant/Nominated Person
SPRUSON & FERGUSON

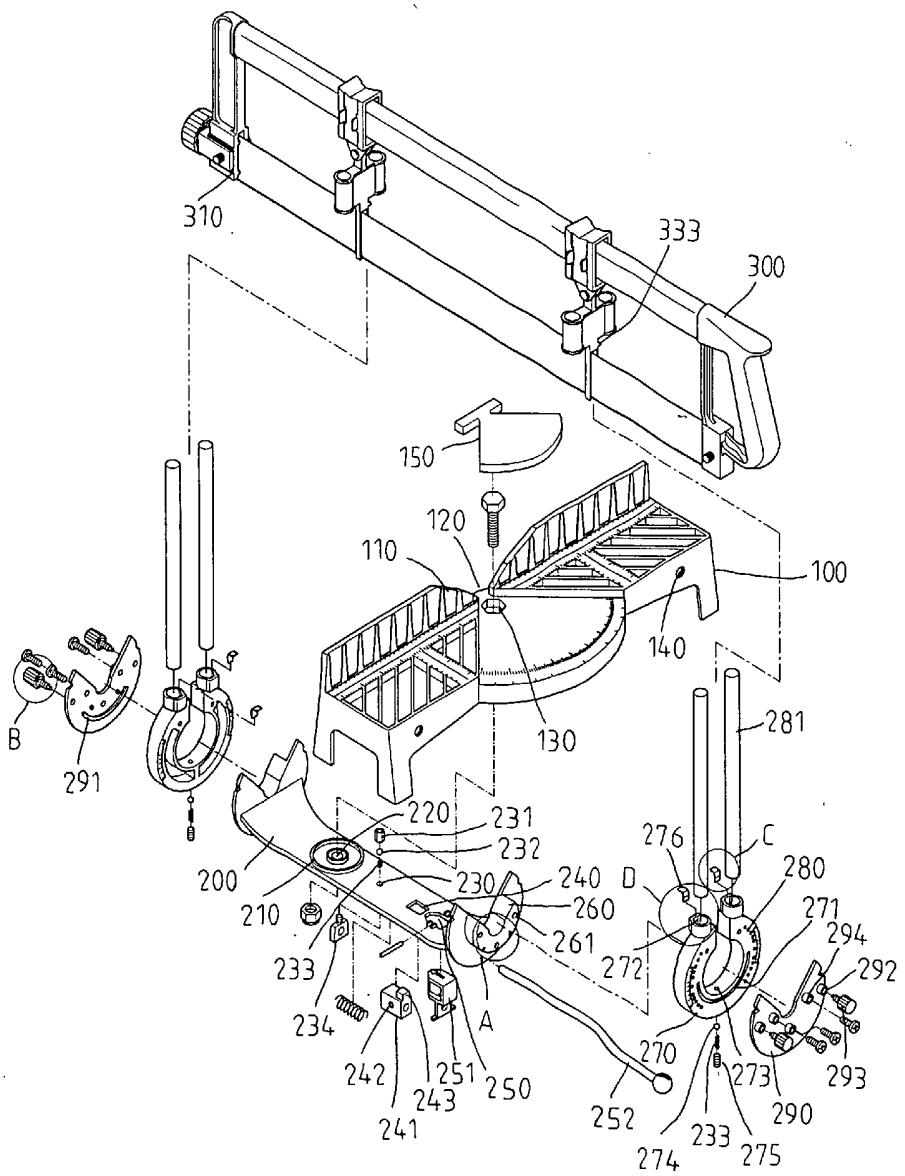
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FIG. 1

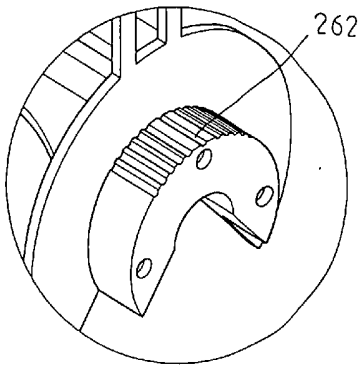

FIG. 2

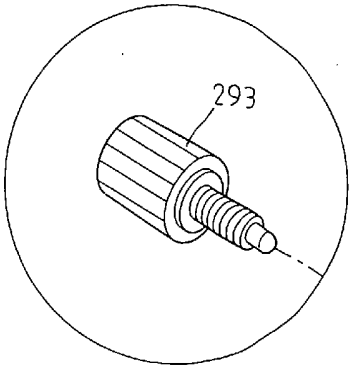

FIG. 3

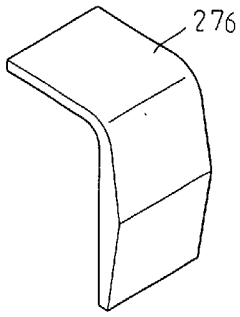

FIG. 4

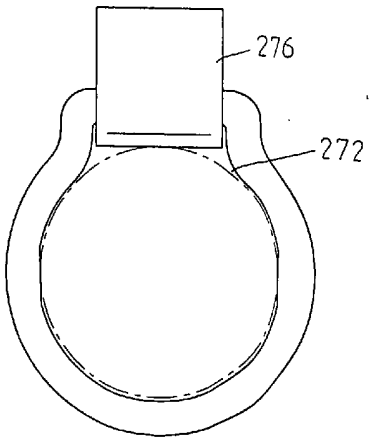

FIG. 5

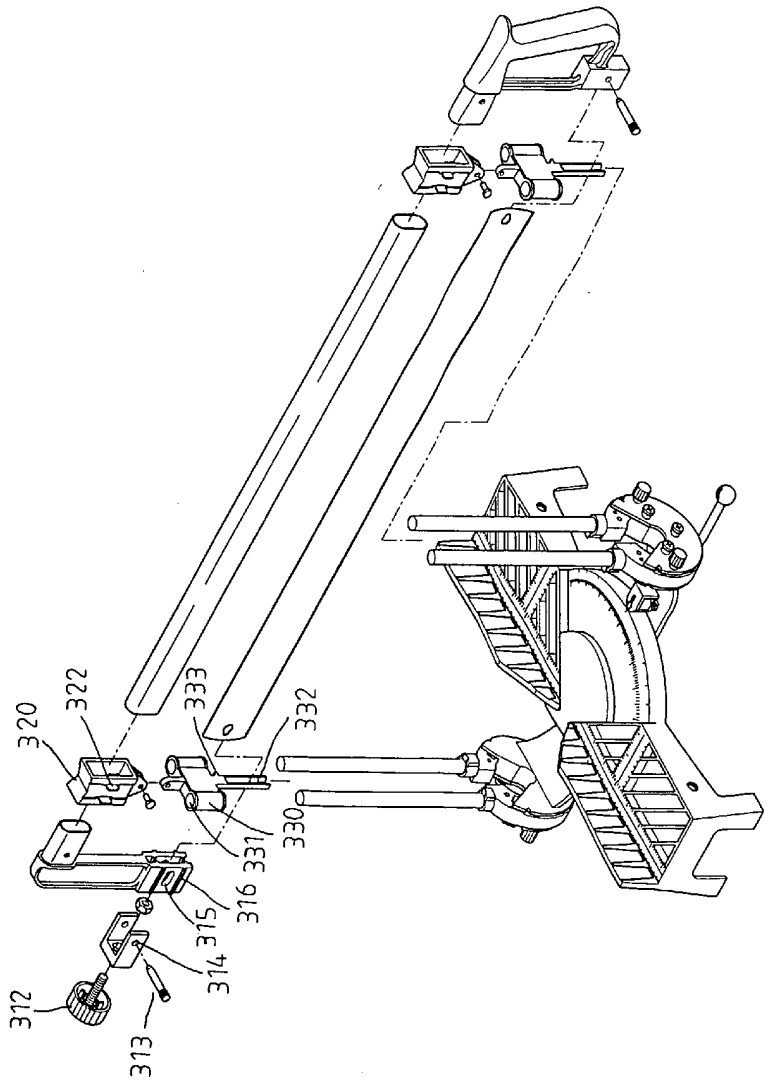

FIG. 6

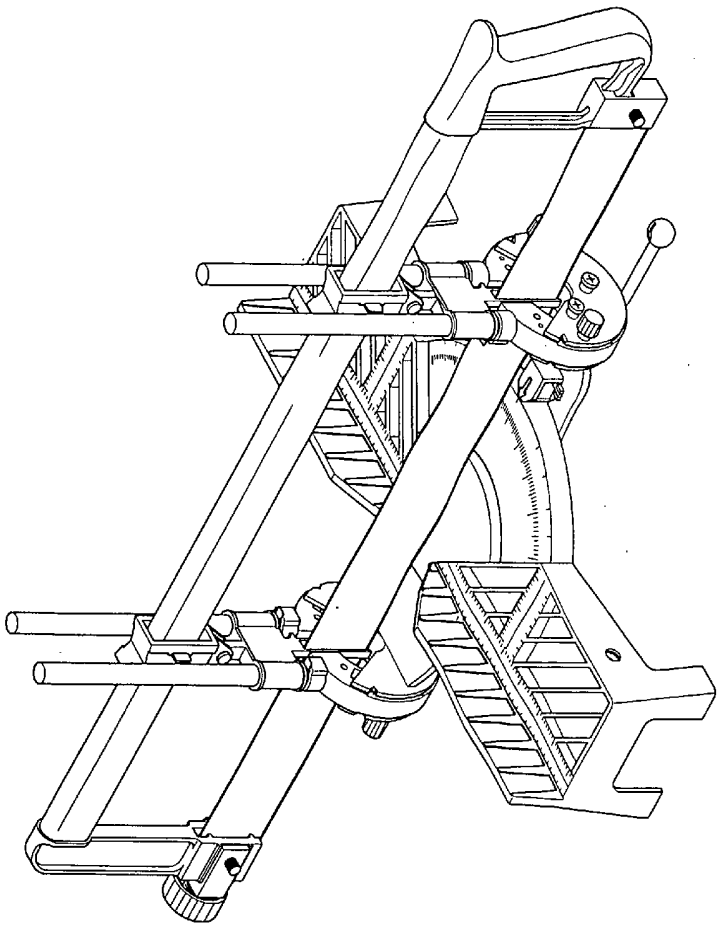

FIG. 7

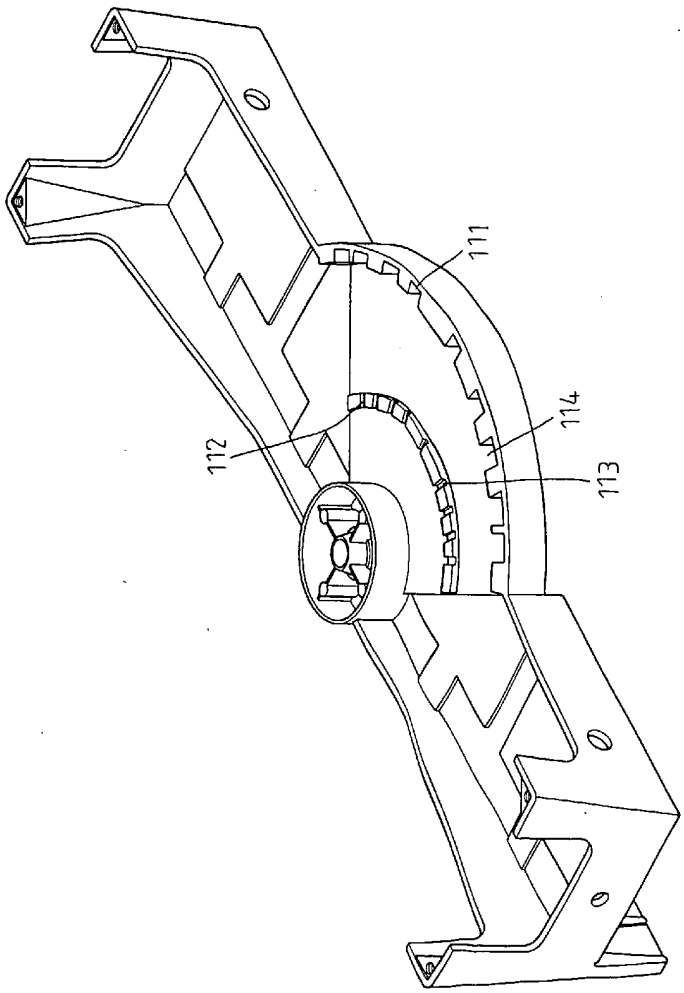

FIG. 8

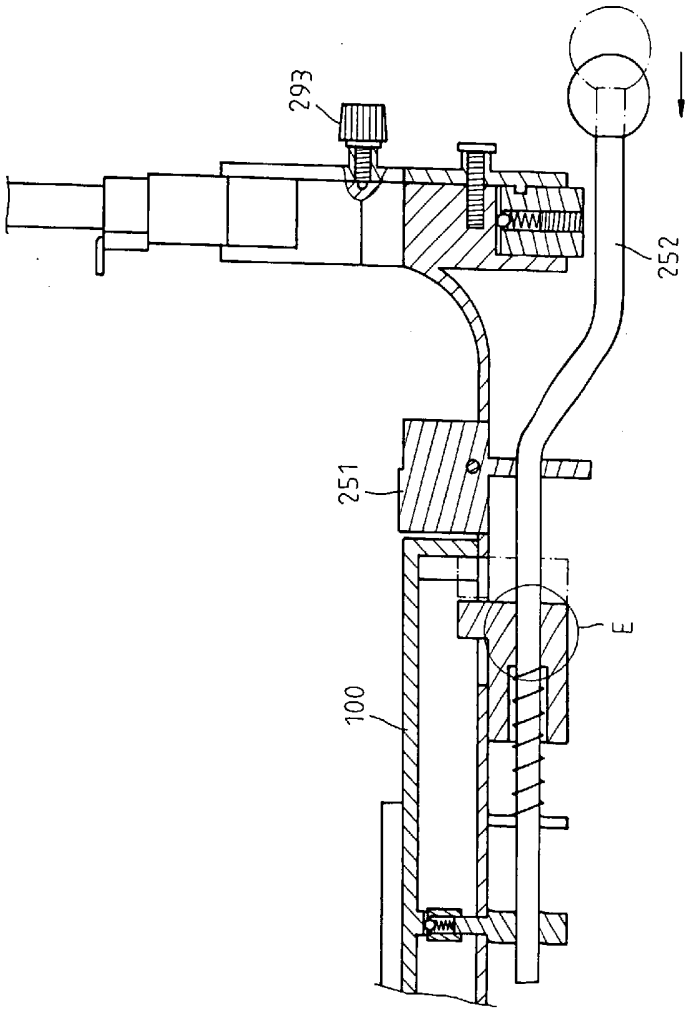

FIG. 9

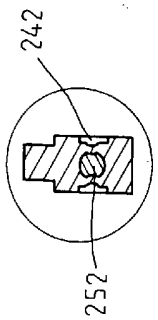

FIG. 10

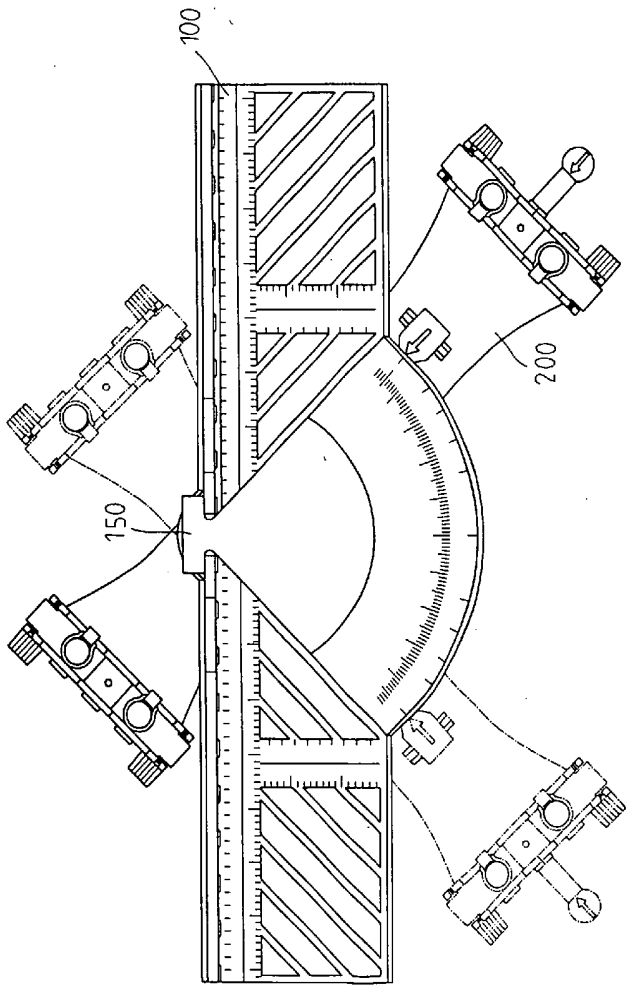

FIG. 11

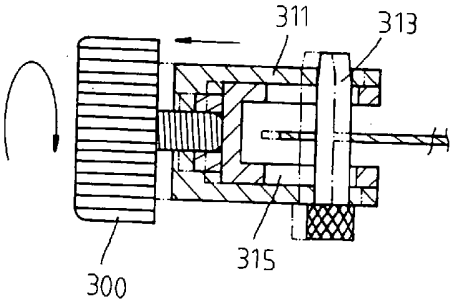

FIG. 12

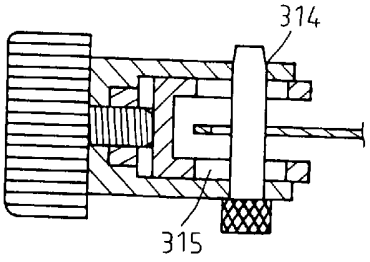

FIG. 13

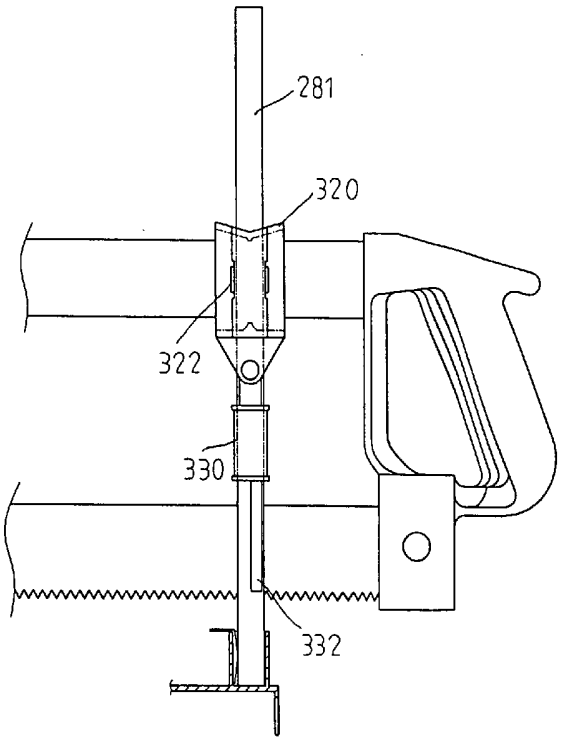

FIG. 14

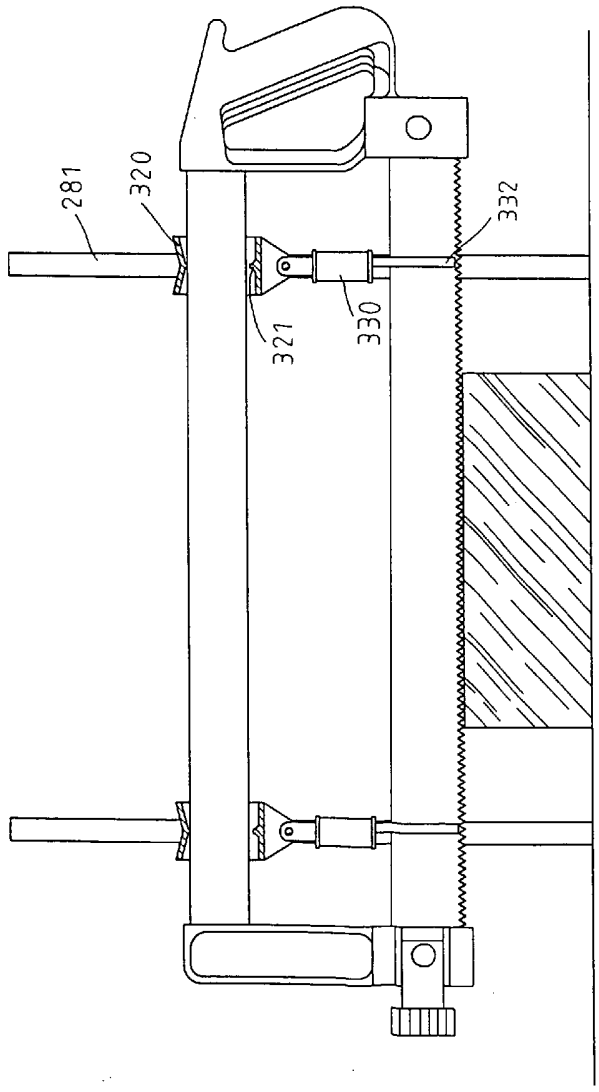

FIG. 15

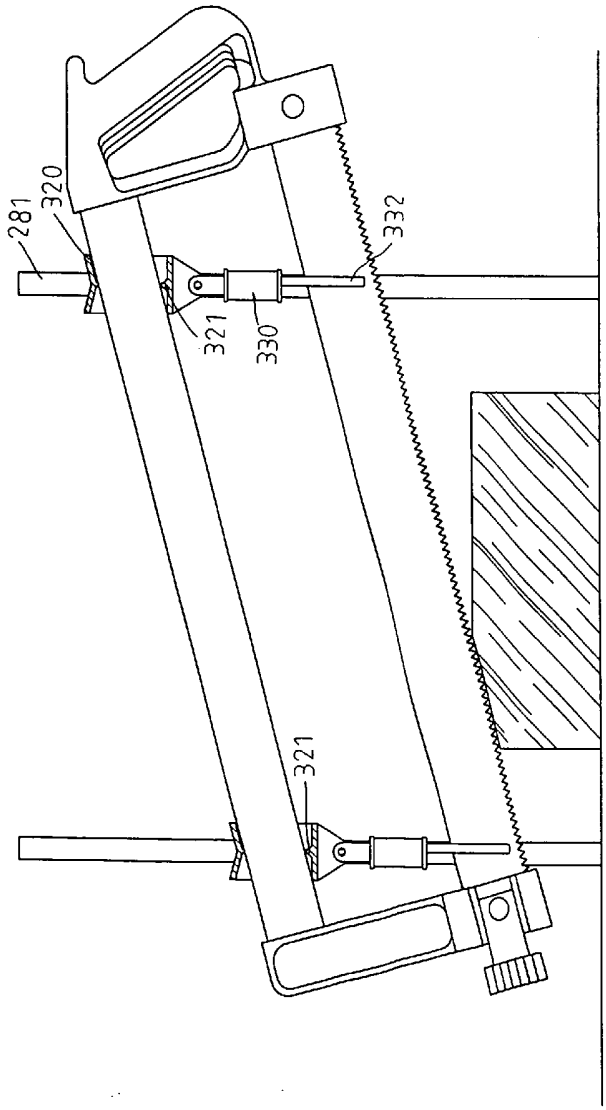

FIG. 16

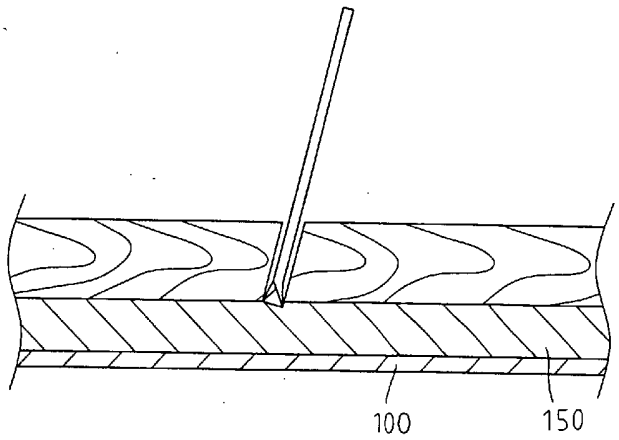

FIG. 17

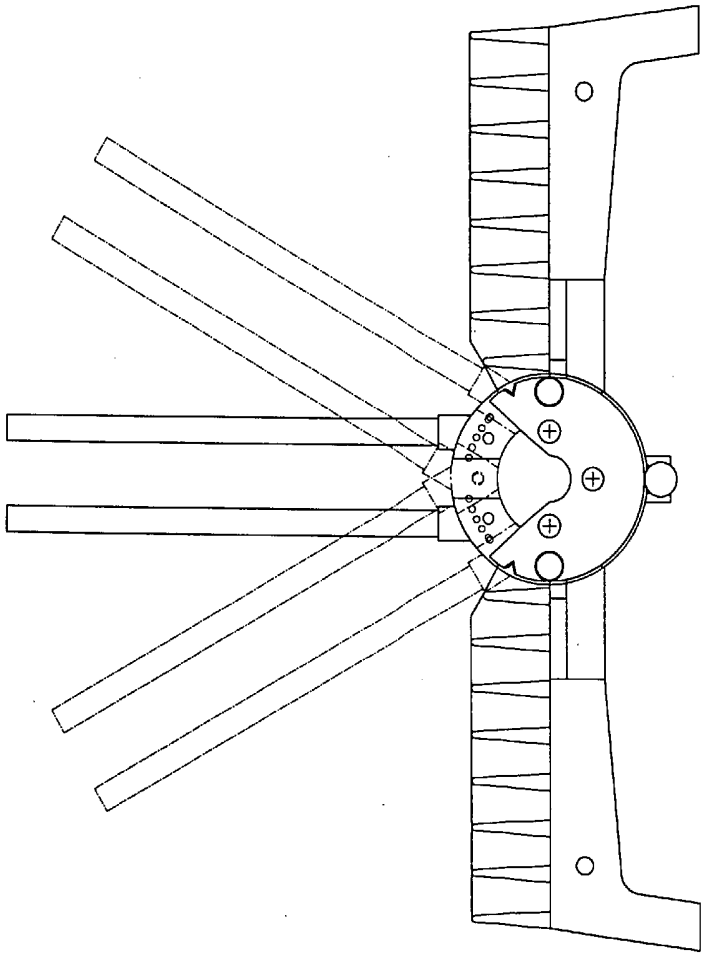

FIG. 18

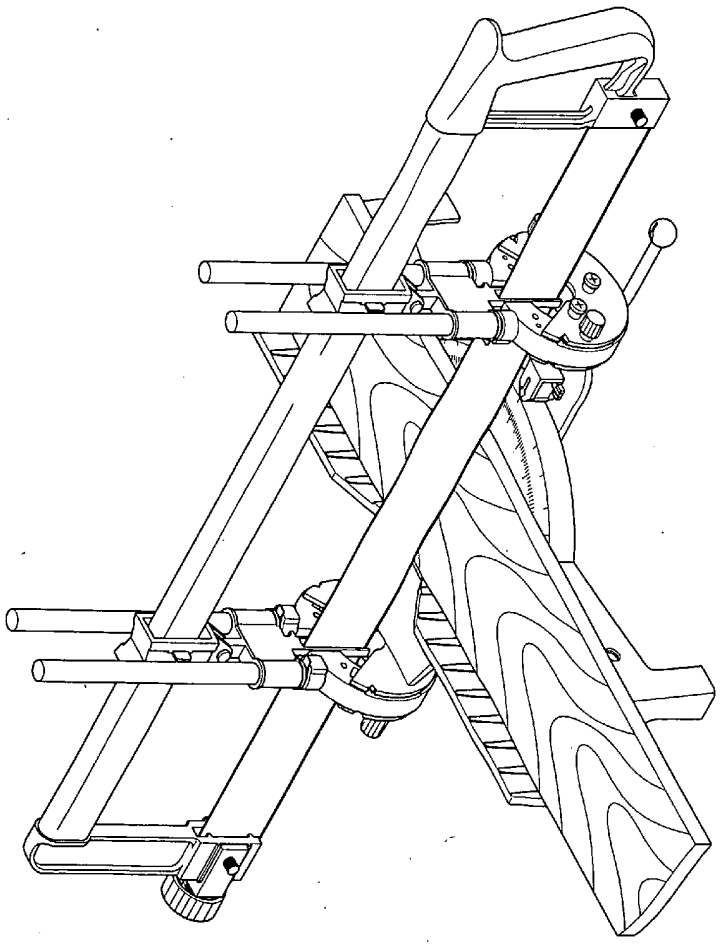

FIG. 19