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(71) Applicant(s):  
**Ho Cheng Garden Tools Co., Ltd**  
**(Incorporated in Taiwan)**  
**No 752 Sec 4 Yen Hai Road, Fu Shing Hsiang,**  
**Chang Hua Hsien, Taiwan**

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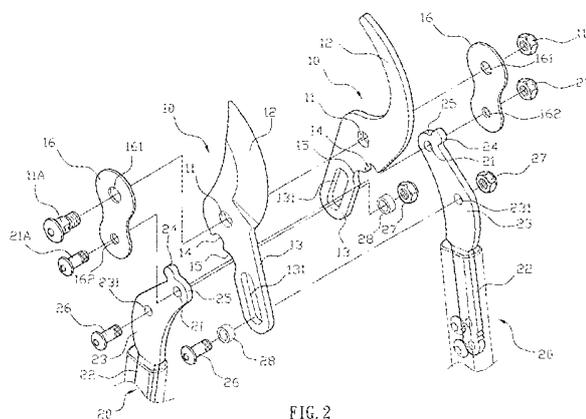
(72) Inventor(s):  
**Yao-Chung Huang**

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(74) Agent and/or Address for Service:  
**Alpha & Omega**  
**Chine Croft, East Hill, OTTERY ST.MARY, Devon,**  
**EX11 1PJ, United Kingdom**

(54) Title of the Invention: **Gardening shears having an energy saving function**  
Abstract Title: **Gardening shears having driving arms**

(57) A pair of gardening shears has two cutters 10 pivotally connected with each other at 11, two driving arms 20 pivotally connected with each other at 25 and each connected with a respective one of the cutters, and two support plates 16 connected with and abutting the cutters and the driving arms so that the cutters and the driving arms are sandwiched between and limited by the support plates. The cutters have a cutting end and a driven end and there is an elongate slot 131 in the driven end. Limit bolts 26 pass between a pivot hole 231 in one driving arm and the slot in the cutter. Thus, the driving arms co-operate with the cutters to perform a shearing action so that the gardening shears have a longer force arm and is operated in an energy-saving manner. In addition, the cutters and the driving arms have two different pivot fulcrums to distribute the shearing force evenly and smoothly so as to prevent from producing a stress concentration at the two pivot fulcrums.



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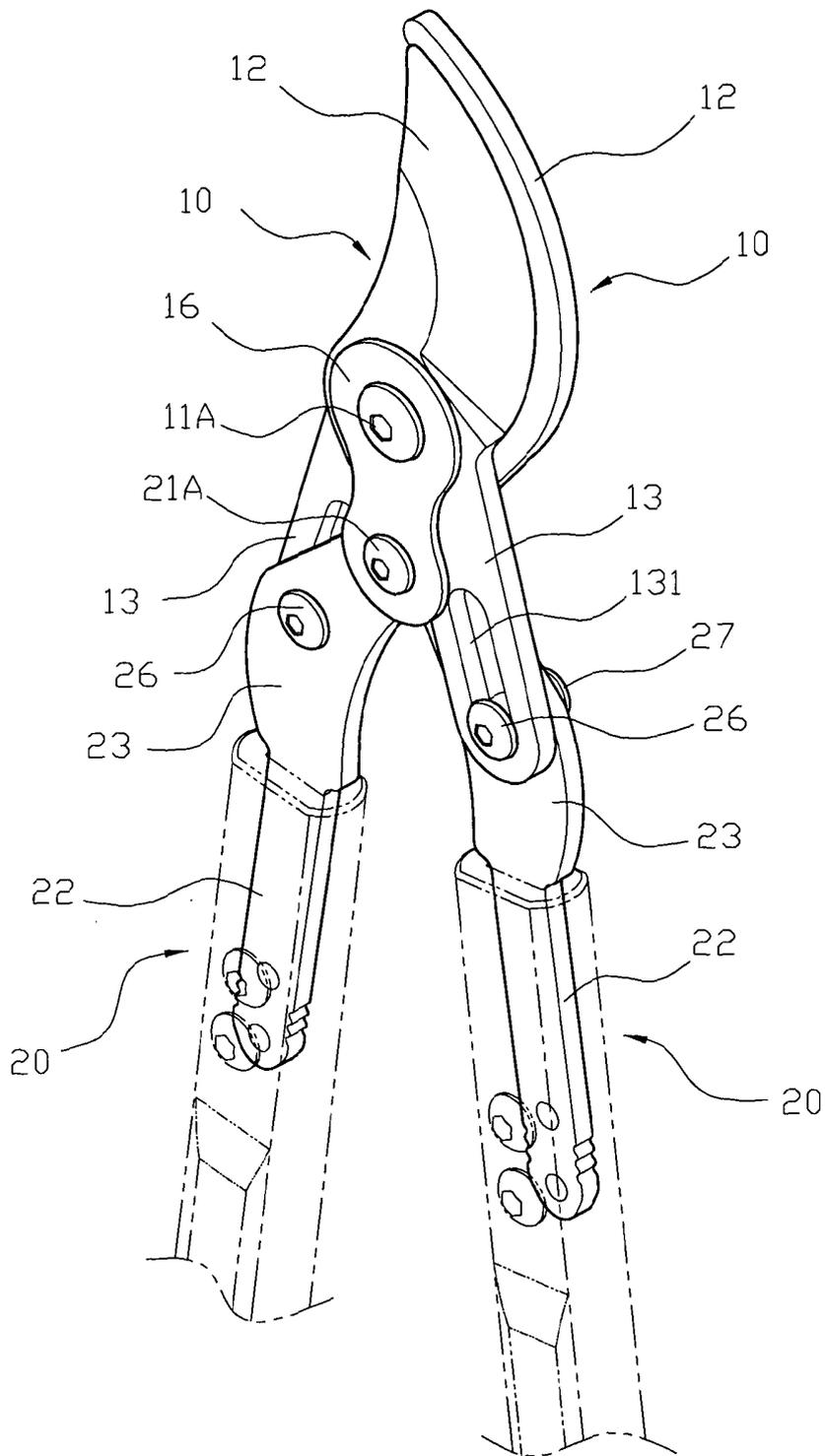


FIG. 1



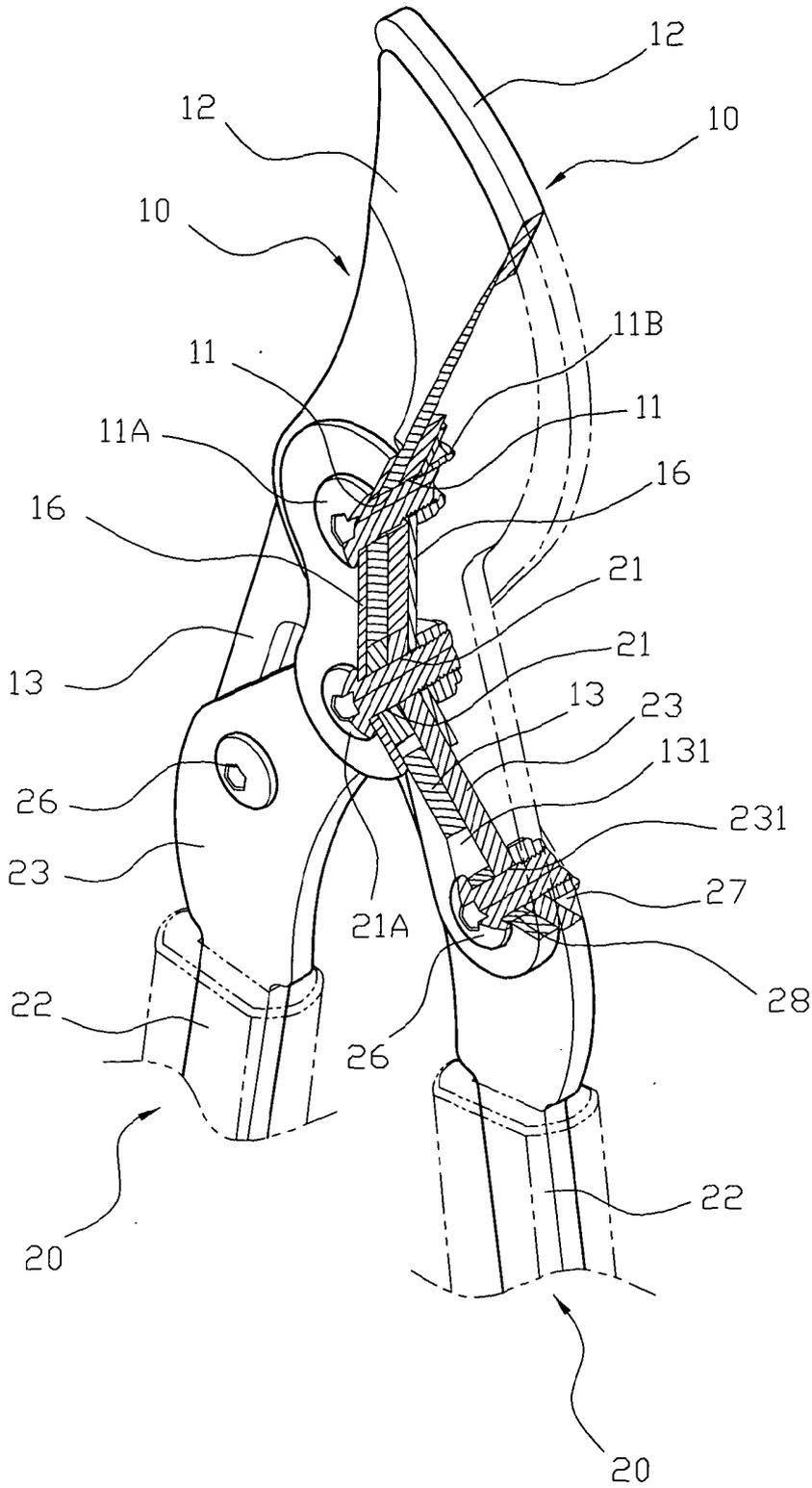


FIG. 3

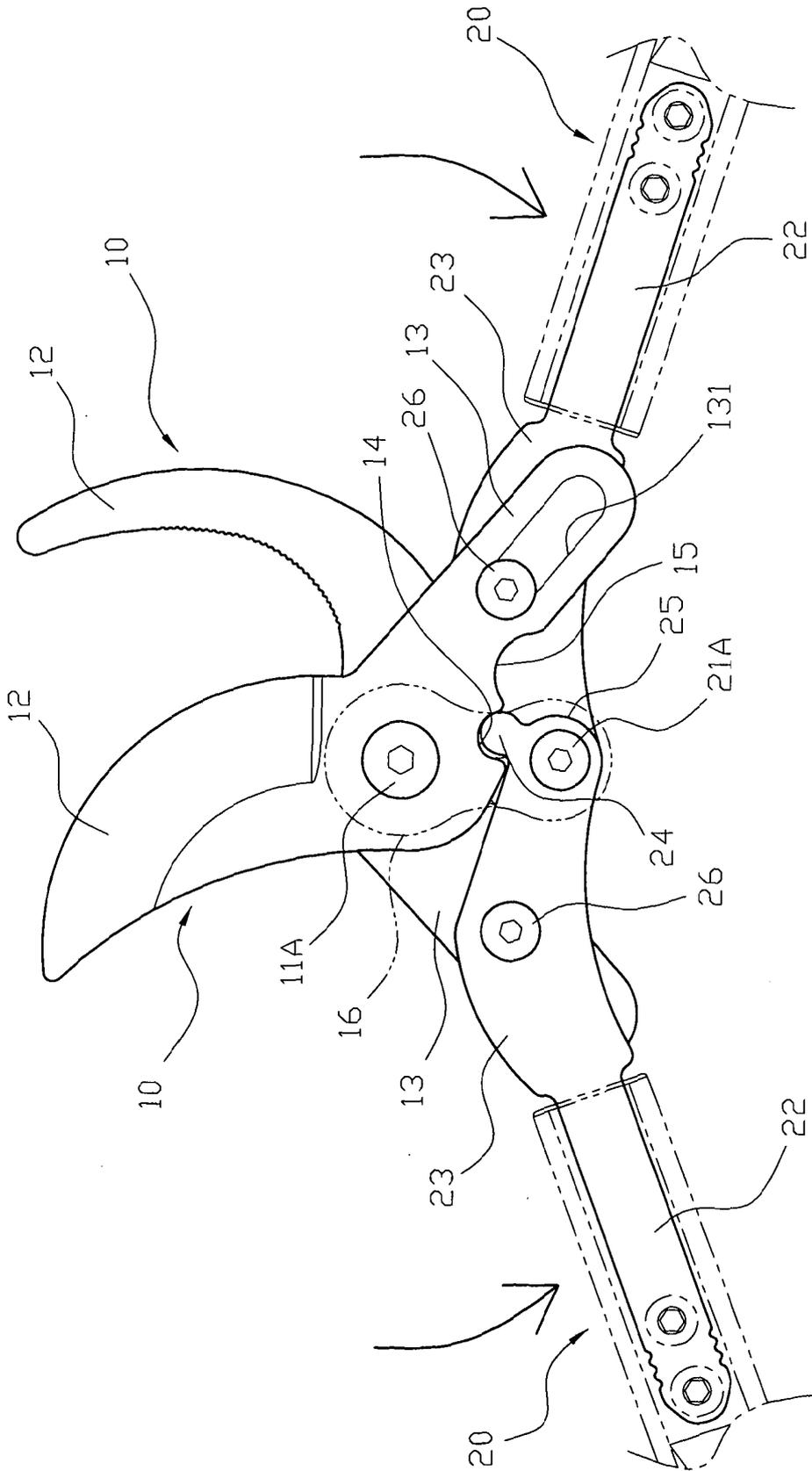


FIG. 4

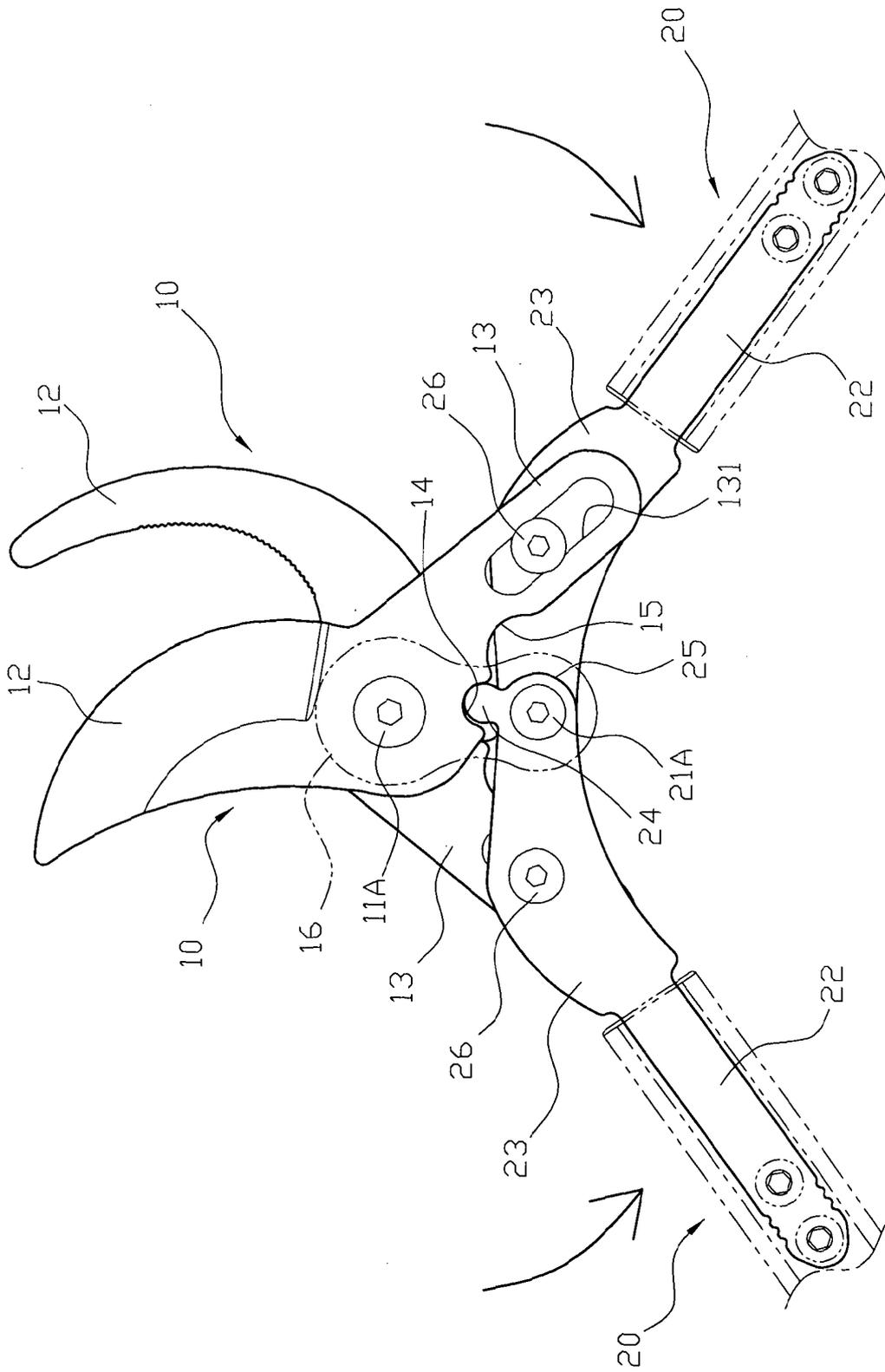


FIG. 5

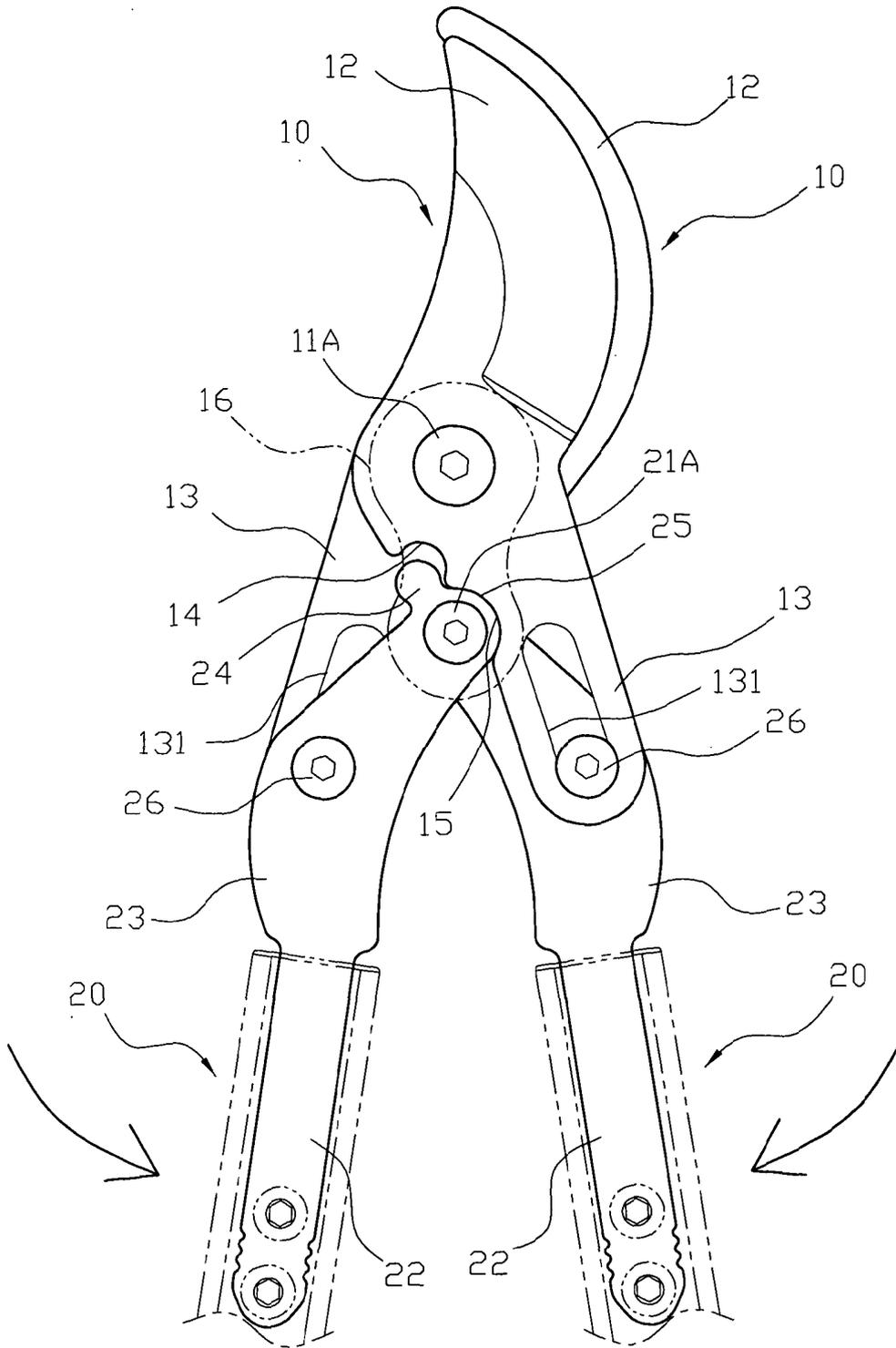


FIG. 6

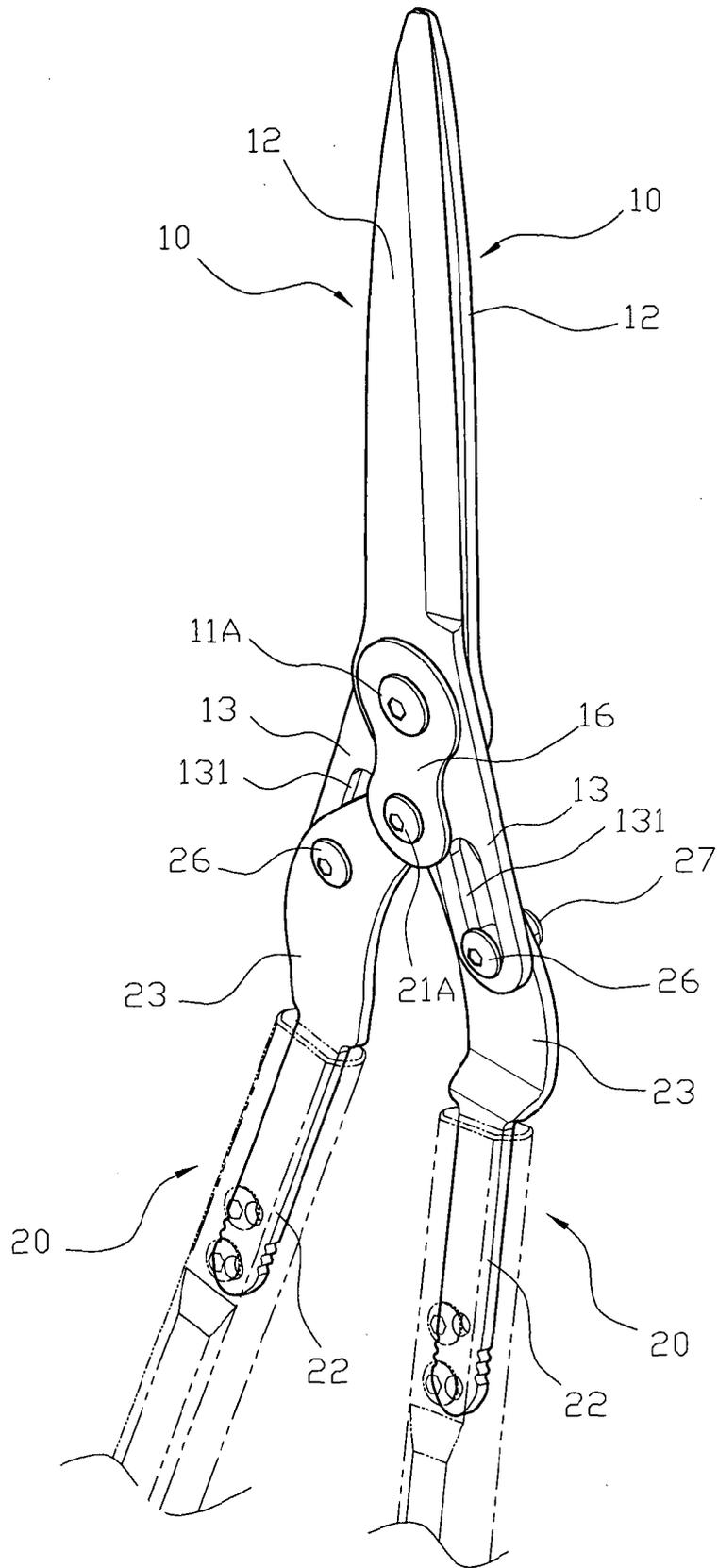
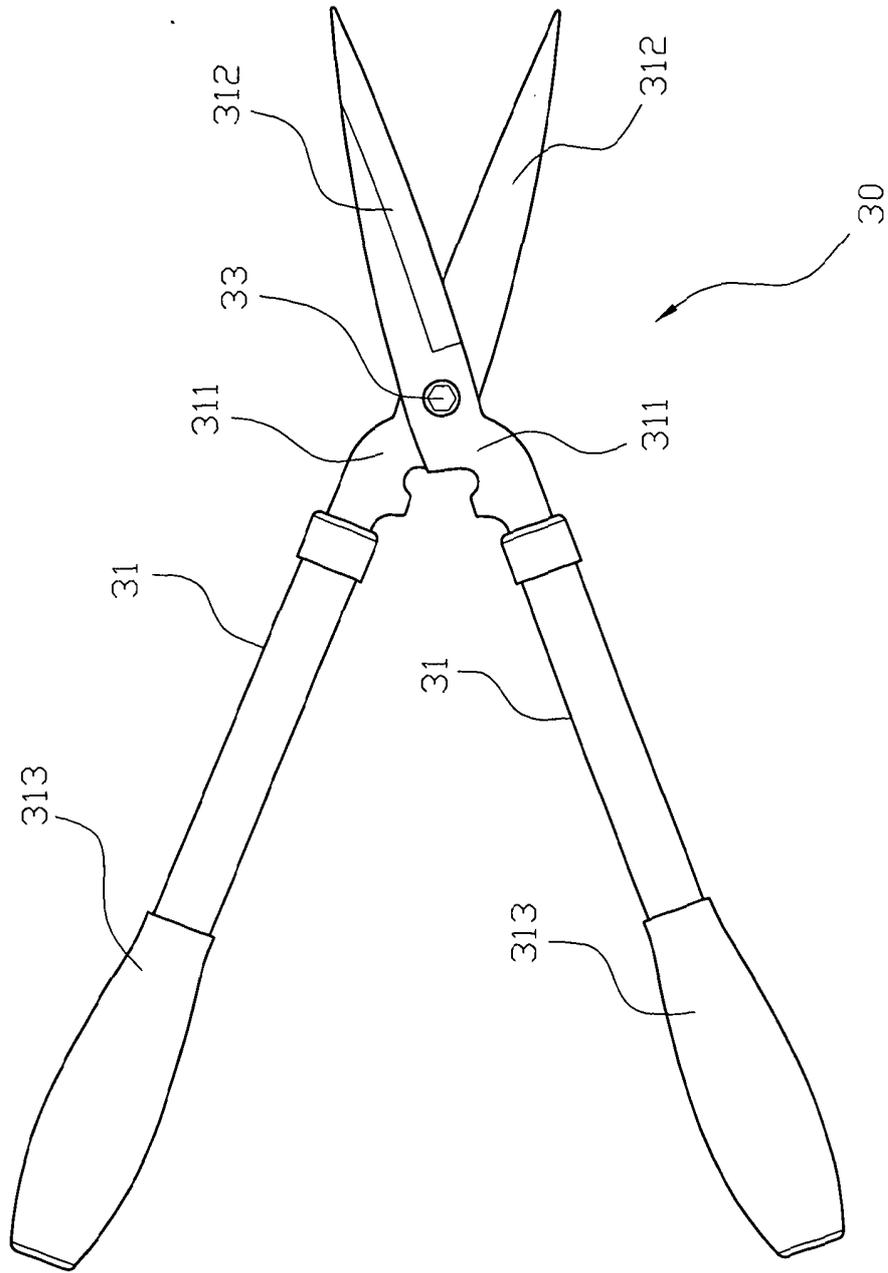


FIG. 7



PRIOR ART  
FIG. 8

# GARDENING SHEARS HAVING AN ENERGY-SAVING FUNCTION

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a gardening cutting tool and, more particularly, to a pair of gardening shears for shearing a plant.

### 2. Description of the Related Art

A gardening cutting tool, such as a pair of gardening shears, is used to cut or shear a plant, such as the branches of a tree. A pair of conventional gardening shears 30 in accordance with the prior art shown in Fig. 8 comprise two cutters 31 pivotally connected with each other and each having a first end provided with a drive handle 313, a second end provided with a cutting blade 312 and a middle portion provided with a connecting part 311 located between the drive handle 313 and the cutting blade 312, and a pivot shaft 33 extending the connecting part 311 of each of the two cutters 31 so that the two cutters 31 are pivotally connected with each other. However, when the branch to be cut is too large or too hard, the gardening shears 30 cannot shear the branch easily. In addition, the two cutters 31 are pivoted about the pivot shaft 33 which is the only pivot fulcrum of the two cutters 31 so that the shearing stress is concentrated on the pivot shaft 33, thereby easily wearing or breaking the pivot shaft 33. Further, the shearing stress is concentrated on the pivot shaft 33 so that the two cutters 31 easily produce a gap at the pivot shaft 33, thereby affecting movement of the two cutters 31.

## BRIEF SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a pair of gardening shears, comprising two cutters pivotally connected with each other, and two driving arms pivotally connected with each other and each connected  
5 with a respective one of the two cutters.

Each of the two cutters has a first end provided with a driven portion, a second end provided with a cutting portion and a middle portion provided with a first pivot hole located between the driven portion and the cutting portion. The driven portion of each of the two cutters has a surface provided  
10 with an elongate sliding slot. Each of the two cutters has a side provided with a first opening and a second opening. Each of the two driving arms has a first end provided with a second pivot hole, a second end provided with a drive portion and a mediate section provided with a connecting portion located between the second pivot hole and the a drive portion. Each of the two driving arms has a  
15 side provided with a first pressing flange that is extendable into the first opening of a respective one of the two cutters and a second pressing flange that is extendable into the second opening of a respective one of the two cutters. The connecting portion of each of the two driving arms has a surface provided with a connecting hole aligning with the sliding slot of a respective one of the  
20 two cutters, and the gardening shears further comprise two limit members each extending through the connecting hole of a respective one of the two driving arms and the sliding slot of a respective one of the two cutters so that the

connecting portion of each of the two driving arms is pivotally connected with the driven portion of a respective one of the two cutters.

The gardening shears further comprise two support plates connected with and abutting the two cutters and the two driving arms so that the two  
5 cutters and the two driving arms are sandwiched between and limited by the two support plates.

The primary objective of the present invention is to provide a pair of gardening shears having an energy-saving function.

According to the primary advantage of the present invention, the two  
10 driving arms co-operate with the two cutters to perform a shearing action so that the gardening shears have a longer force arm to facilitate a user operating the gardening shears in an energy-saving manner.

According to another advantage of the present invention, the first pressing flange of each of the two driving arms pushes the first opening of the  
15 respective cutter to move the respective cutter so that the first pressing flanges of the two driving arms provide an assistant force to move the two cutters, thereby enhancing the shearing effect of the two cutters.

According to a further advantage of the present invention, the two cutters are pivoted about the first pivot hole, and the two driving arms are  
20 pivoted about the second pivot hole so that the two cutters and the two driving arms have two different pivot fulcrums to distribute the shearing force evenly

and smoothly so as to prevent from producing a stress concentration at the two pivot fulcrums.

According to a further advantage of the present invention, the two cutters and the two driving arms are sandwiched between and limited by the two support plates so that the two cutters and the two driving arms are operated and moved solidly and stably.

Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

#### 10 BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

Fig. 1 is a perspective view of a pair of gardening shears in accordance with the preferred embodiment of the present invention.

Fig. 2 is an exploded perspective view of the gardening shears as shown in Fig. 1.

15 Fig. 3 is a partially perspective cross-sectional view of the gardening shears as shown in Fig. 1.

Fig. 4 is a front operational view of the gardening shears as shown in Fig. 1.

Fig. 5 is an operational view of the gardening shears as shown in Fig. 20 4.

Fig. 6 is an operational view of the gardening shears as shown in Fig. 5.

Fig. 7 is a perspective view of a pair of gardening shears in accordance with another preferred embodiment of the present invention.

Fig. 8 is a front view of a pair of conventional gardening shears in accordance with the prior art.

#### 5 DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings and initially to Figs. 1-3, a pair of gardening shears in accordance with the preferred embodiment of the present invention comprise two cutters 10 pivotally connected with each other, two driving arms 20 pivotally connected with each other and each connected with a  
10 respective one of the two cutters 10, and two support plates 16 connected with and abutting the two cutters 10 and the two driving arms 20 so that the two cutters 10 and the two driving arms 20 are sandwiched between and limited by the two support plates 16.

Each of the two cutters 10 has a first end provided with a driven  
15 portion 13, a second end provided with a cutting portion 12 and a middle portion provided with a first pivot hole 11 located between the driven portion 13 and the cutting portion 12. The two cutters 10 are pivotally connected at the first pivot hole 11 thereof. The cutting portions 12 of the two cutters 10 may have different shapes and forms, and the first pivot holes 11 of the two cutters  
20 10 may have different shapes. Preferably, the cutting portion 12 of each of the two cutters 10 is a blade or an anvil. The driven portion 13 of each of the two cutters 10 has a surface provided with an elongate sliding slot 131. Each of the

two cutters 10 has a side provided with a first opening 14 and a second opening 15 each located between the first pivot hole 11 and the sliding slot 131. The first opening 14 and the second opening 15 of each of the two cutters 10 are located at an inner side of the driven portion 13 so that the first openings 14 and the second openings 15 of the two cutters 10 face each other respectively. The first opening 14 of each of the two cutters 10 is located between the first pivot hole 11 and the second opening 15 and has a size smaller than that of the second opening 15.

Each of the two driving arms 20 has a first end provided with a second pivot hole 21, a second end provided with a drive portion 22 and a mediate section provided with a connecting portion 23 located between the second pivot hole 21 and the a drive portion 22. The two driving arms 20 are pivotally connected at the second pivot hole 21 thereof. Each of the two driving arms 20 has a side provided with a first pressing flange 24 that is extendable into the first opening 14 of a respective one of the two cutters 10 and a second pressing flange 25 that is extendable into the second opening 15 of a respective one of the two cutters 10. The first pressing flange 24 and the second pressing flange 25 of each of the two driving arms 20 is located beside the second pivot hole 21.

The connecting portion 23 of each of the two driving arms 20 has a surface provided with a connecting hole 231 aligning with the sliding slot 131 of a respective one of the two cutters 10, and the gardening shears further

comprise two limit members 26 each extending through the connecting hole 231 of a respective one of the two driving arms 20 and the sliding slot 131 of a respective one of the two cutters 10 so that the connecting portion 23 of each of the two driving arms 20 is pivotally connected with the driven portion 13 of a  
5 respective one of the two cutters 10. Each of the two limit members 26 is a fastening bolt which is slidable in the sliding slot 131 of the respective cutter 10, and the gardening shears further comprise two fastening nuts 27 each screwed onto a respective one of the two limit members 26, and two bushings 28 each mounted on a respective one of the two limit members 26 and each  
10 slidable in the sliding slot 131 of the respective cutter 10.

Each of the two support plates 16 has a first end provided with a first through hole 161 aligning with the first pivot hole 11 of a respective one of the two cutters 10 and a second end provided with a second through hole 162 aligning with the second pivot hole 21 of a respective one of the two driving  
15 arms 20, and the gardening shears further comprise a first pivot bolt 11A extending through the first through hole 161 of each of the two support plates 16 and the first pivot hole 11 of each of the two cutters 10, a first locking nut 11B screwed onto the first pivot bolt 11A, a second pivot bolt 21A extending through the second through hole 162 of each of the two support plates 16 and  
20 the second pivot hole 21 of each of the two driving arms 20, and a second locking nut 21B screwed onto the second pivot bolt 21A. Thus, the two cutters 10 are limited between the two support plates 16 by the first pivot bolt 11A and

the first locking nut 11B, and the two driving arms 20 are limited between the two support plates 16 by the second pivot bolt 21A and the second locking nut 21B.

In operation, referring to Figs. 4-6 with reference to Figs. 1-3, the two cutters 10 are pivoted about the first pivot hole 11, and the two driving arms 20 are pivoted about the second pivot hole 21 so that the two cutters 10 and the two driving arms 20 have two different pivot fulcrums (the first pivot hole 11 and the second pivot hole 21). In addition, each of the two limit members 26 is slidable in the sliding slot 131 of the respective cutter 10 so that the connecting portion 23 of each of the two driving arms 20 is pivotally and movably connected with the driven portion 13 of the respective cutter 10. In such a manner, when the two driving arms 20 are moved by an external force, the two driving arms 20 are pivoted about the second pivot hole 21, and the connecting portion 23 of each of the two driving arms 20 is driven to move the respective limit member 26 which moves the driven portion 13 of the respective cutter 10 so that the two cutters 10 are driven and pivoted about the first pivot hole 11, and the cutting portions 12 of the two cutters 10 are moved relative to each other. At this time, the first pressing flange 24 of each of the two driving arms 20 can be moved toward and extended into the first opening 14 of the respective cutter 10, and the second pressing flange 25 of each of the two driving arms 20 can be moved toward and extended into the second opening 15 of the respective cutter 10.

Thus, when the two driving arms 20 are moved and pivoted outward relative each other, the two cutters 10 are moved and pivoted relative to each other from the closed position as shown in Figs. 1 and 6 to the opened position as shown in Fig. 4, so that the cutting portions 12 of the two cutters 10 are moved outward relative to each other. On the contrary, when the two driving arms 20 are moved and pivoted toward each other, the two cutters 10 are moved and pivoted relative to each other from the opened position as shown in Fig. 4 to the closed position as shown in Figs. 1 and 6, so that the cutting portions 12 of the two cutters 10 are moved toward each other to perform a cutting or shearing action so as to cut or prune a plant and the like.

As shown in Fig. 4, when the two cutters 10 are moved to the opened position, the cutting portions 12 of the two cutters 10 are moved to space from each other, each of the two limit members 26 is moved to abut the uppermost limit of the sliding slot 131 of the respective cutter 10 and is proximate to the first pivot hole 11, and the first pressing flange 24 of each of the two driving arms 20 is moved and extended into the first opening 14 of the respective cutter 10.

As shown in Fig. 5, when the two cutters 10 are moved from the opened position toward the closed position, the cutting portions 12 of the two cutters 10 are moved toward each other, each of the two limit members 26 is moved in the sliding slot 131 of the respective cutter 10 and is moved from the uppermost limit of the sliding slot 131 of the respective cutter 10 toward the

lowermost limit of the sliding slot 131 of the respective cutter 10, and the first pressing flange 24 of each of the two driving arms 20 is rotated in a curved manner to push the first opening 14 of the respective cutter 10 so as to move the respective cutter 10.

5           As shown in Fig. 6, when the two cutters 10 are moved to the closed position, the cutting portions 12 of the two cutters 10 are moved to abut each other, each of the two limit members 26 is moved to abut the lowermost limit of the sliding slot 131 of the respective cutter 10 and is distal to the first pivot hole 11, the first pressing flange 24 of each of the two driving arms 20 is  
10 moved to detach from the first opening 14 of the respective cutter 10, and the second pressing flange 25 of each of the two driving arms 20 is moved and extended into the second opening 15 of the respective cutter 10.

          As shown in Figs. 1-6, the cutting portion 12 of one of the two cutters 10 is a blade, and the cutting portion 12 of the other one of the two cutters 10 is  
15 an anvil so that the cutting portions 12 of the two cutters 10 can be used to cut branches.

          As shown in Fig. 7, the cutting portion 12 of each of the two cutters 10 is an elongate blade so that the cutting portions 12 of the two cutters 10 can be used to shear flowers and grass.

20           Accordingly, the two driving arms 20 co-operate with the two cutters 10 to perform a shearing action so that the gardening shears have a longer force arm to facilitate a user operating the gardening shears in an energy-saving

manner. In addition, the first pressing flange 24 of each of the two driving arms 20 pushes the first opening 14 of the respective cutter 10 to move the respective cutter 10 so that the first pressing flanges 24 of the two driving arms 20 provide an assistant force to move the two cutters 10, thereby enhancing the shearing effect of the two cutters 10. Further, the two cutters 10 are pivoted about the first pivot hole 11, and the two driving arms 20 are pivoted about the second pivot hole 21 so that the two cutters 10 and the two driving arms 20 have two different pivot fulcrums to distribute the shearing force evenly and smoothly so as to prevent from producing a stress concentration at the two pivot fulcrums. Further, the two cutters 10 and the two driving arms 20 are sandwiched between and limited by the two support plates 16 so that the two cutters 10 and the two driving arms 20 are operated and moved solidly and stably.

Although the invention has been explained in relation to its preferred embodiment(s) as mentioned above, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended claim or claims will cover such modifications and variations that fall within the true scope of the invention.

## CLAIMS

1. A pair of gardening shears, comprising:

two cutters pivotally connected with each other; and

two driving arms pivotally connected with each other and each

5 connected with a respective one of the two cutters;

wherein each of the two cutters has a first end provided with a driven portion, a second end provided with a cutting portion and a middle portion provided with a first pivot hole located between the driven portion and the cutting portion;

10 the driven portion of each of the two cutters has a surface provided with an elongate sliding slot;

each of the two cutters has a side provided with a first opening and a second opening;

each of the two driving arms has a first end provided with a second pivot hole, a second end provided with a drive portion and a mediate section provided with a connecting portion located between the second pivot hole and the a drive portion;

each of the two driving arms has a side provided with a first pressing flange that is extendable into the first opening of a respective one of the two cutters and a second pressing flange that is extendable into the second opening of a respective one of the two cutters;

the connecting portion of each of the two driving arms has a surface provided with a connecting hole aligning with the sliding slot of a respective one of the two cutters;

the gardening shears further comprise:

5 two limit members each extending through the connecting hole of a respective one of the two driving arms and the sliding slot of a respective one of the two cutters so that the connecting portion of each of the two driving arms is pivotally connected with the driven portion of a respective one of the two cutters.

10 2. The gardening shears of claim 1, wherein the gardening shears further comprise:

two support plates connected with and abutting the two cutters and the two driving arms so that the two cutters and the two driving arms are sandwiched between and limited by the two support plates.

15 3. The gardening shears of claim 2, wherein

each of the two support plates has a first end provided with a first through hole aligning with the first pivot hole of a respective one of the two cutters and a second end provided with a second through hole aligning with the second pivot hole of a respective one of the two driving arms;

20 the gardening shears further comprise:

a first pivot bolt extending through the first through hole of each of the two support plates and the first pivot hole of each of the two cutters;

a first locking nut screwed onto the first pivot bolt;

a second pivot bolt extending through the second through hole of each of the two support plates and the second pivot hole of each of the two driving arms; and

5 a second locking nut screwed onto the second pivot bolt;

the two cutters are limited between the two support plates by the first pivot bolt and the first locking nut;

the two driving arms are limited between the two support plates by the second pivot bolt and the second locking nut.

10 4. The gardening shears of claim 1, wherein

the first opening and the second opening of each of the two cutters are located at an inner side of the driven portion so that the first openings and the second openings of the two cutters face each other respectively;

15 the first opening of each of the two cutters is located between the first pivot hole and the second opening;

the first opening of each of the two cutters has a size smaller than that of the second opening.

5. The gardening shears of claim 1, wherein

each of the two limit members is a fastening bolt;

20 each of the two limit members is slidable in the sliding slot of the respective cutter;

the gardening shears further comprise:

two fastening nuts each screwed onto a respective one of the two limit members; and

two bushings each mounted on a respective one of the two limit members and each slidable in the sliding slot of the respective cutter.

5           6. The gardening shears of claim 1, wherein  
the two cutters are pivotally connected at the first pivot hole thereof;  
the two driving arms are pivotally connected at the second pivot hole thereof.

10           7. The gardening shears of claim 1, wherein  
the first opening and the second opening of each of the two cutters are located between the first pivot hole and the sliding slot;  
the first pressing flange and the second pressing flange of each of the two driving arms is located beside the second pivot hole.

8. Gardening shears substantially as hereinbefore described with reference to and as shown in Figures 1 – 7 of the accompanying drawings.



**Application No:** GB1019878.6

**Examiner:** H Yates

**Claims searched:** 1-7

**Date of search:** 23 March 2011

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	-	US2009/044412 A1 Hsieh; see figures 2 and 5
A	-	GB622598 A Brockhurst; see figures 4 and 6
A	-	GB2444912 A Ho Cheng Garden Tools Co Ltd; see figure 2
A	-	DE202004001903 U1 Fischer; see figures
A	-	US5809654 A Huang; see figure 1

**Categories:**

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

**Field of Search:**

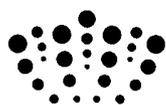
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

Worldwide search of patent documents classified in the following areas of the IPC

A01G; B26B

The following online and other databases have been used in the preparation of this search report

WPI & EPODOC



**International Classification:**

<b>Subclass</b>	<b>Subgroup</b>	<b>Valid From</b>
A01G	0003/02	01/01/2006
A01G	0003/025	01/01/2006
A01G	0003/04	01/01/2006
A01G	0003/047	01/01/2006
A01G	0003/06	01/01/2006
B26B	0013/00	01/01/2006
B26B	0013/26	01/01/2006