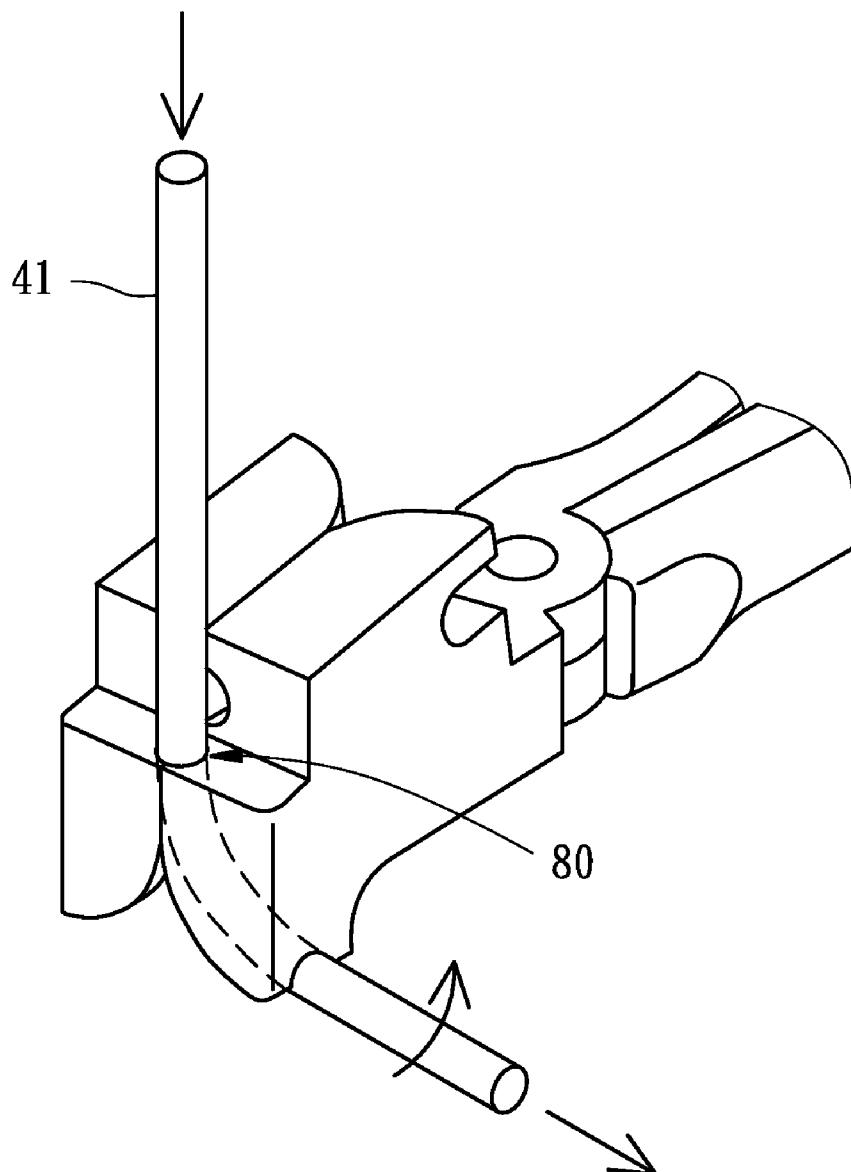




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(19) **United States**(12) **Patent Application Publication**  
**Chen**(10) **Pub. No.: US 2011/0219846 A1**(43) **Pub. Date: Sep. 15, 2011**(54) **BIDIRECTIONAL PIPE BENDING PLIERS**(52) **U.S. Cl. .... 72/409.19; 72/459; 72/475**(76) **Inventor: Jun Fan Chen, Taichung City (TW)**(57) **ABSTRACT**(21) **Appl. No.: 12/723,626**

A pair of bidirectional pipe bending pliers comprises: a first handle and a second handle. The first handle includes a first handle portion and a first pipe-bending portion, and the second handle includes a second handle portion and a second pipe-bending portion. When the first and second pipe-bending portions are closed toward each other to carry out clamping operation, the first and third bending grooves will define a first pipe-bending path therebetween, while the second and fourth bending grooves will also define a second pipe-bending path, the first and second pipe-bending paths extend in different axial directions.

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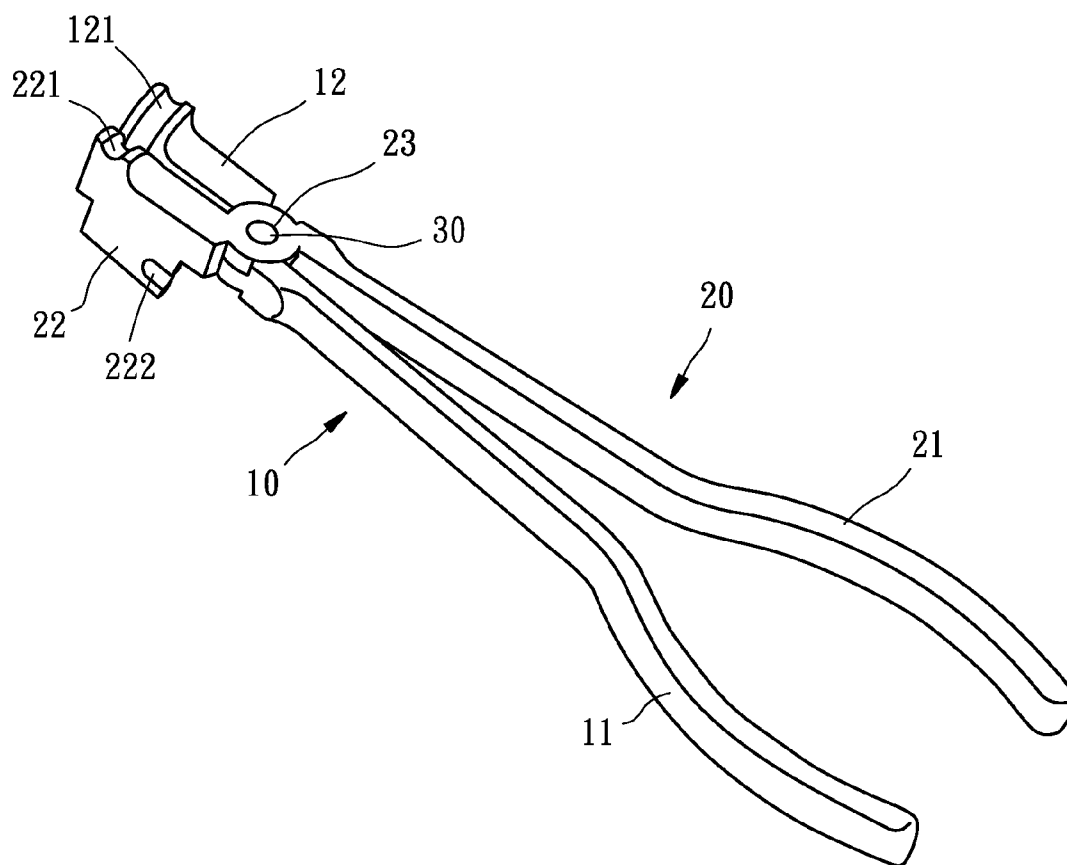


FIG. 1

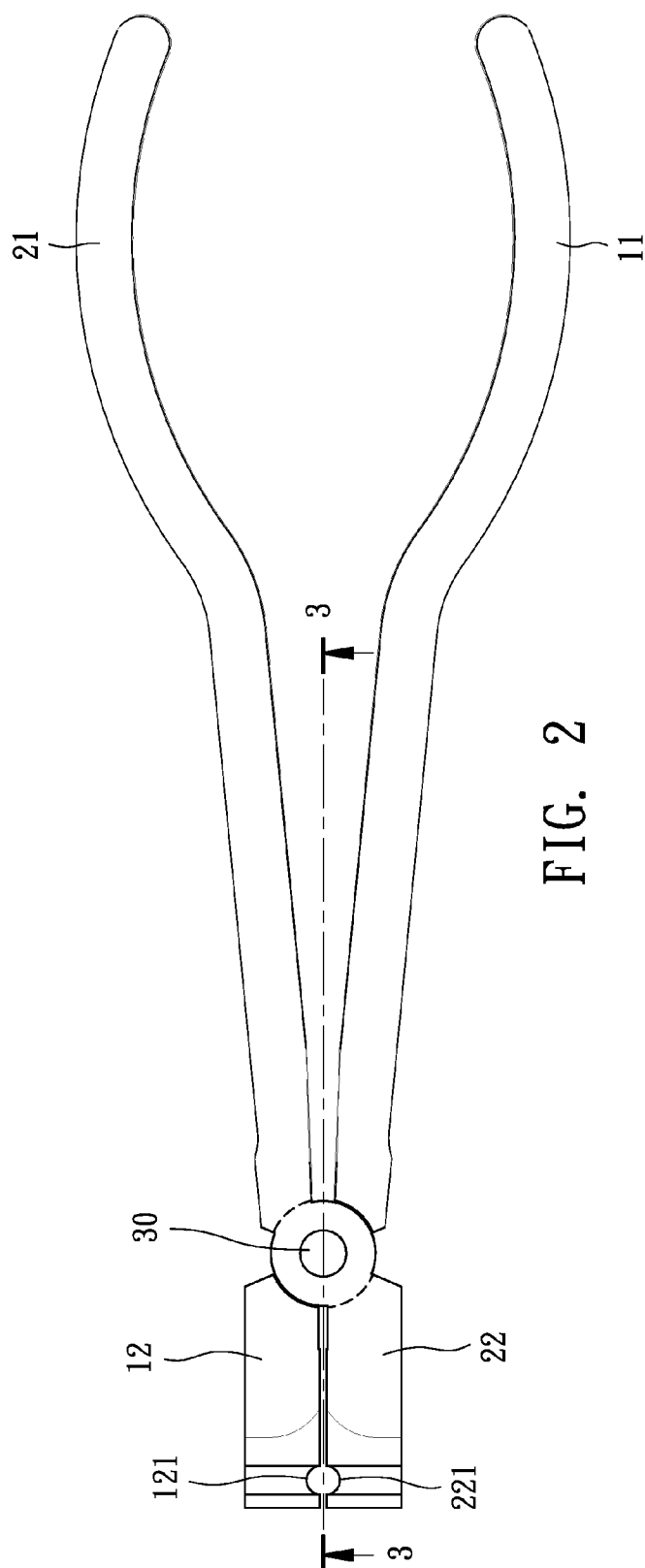


FIG. 2

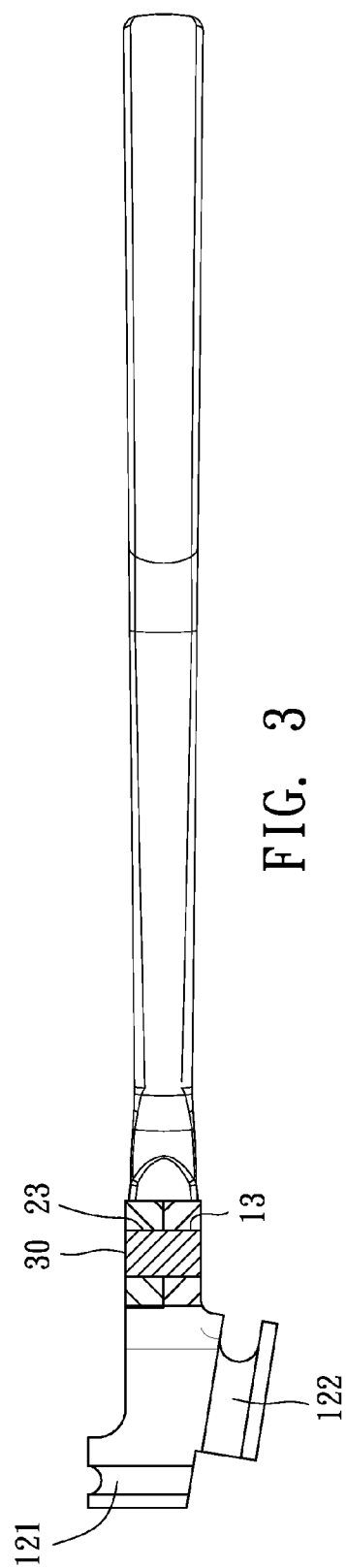


FIG. 3

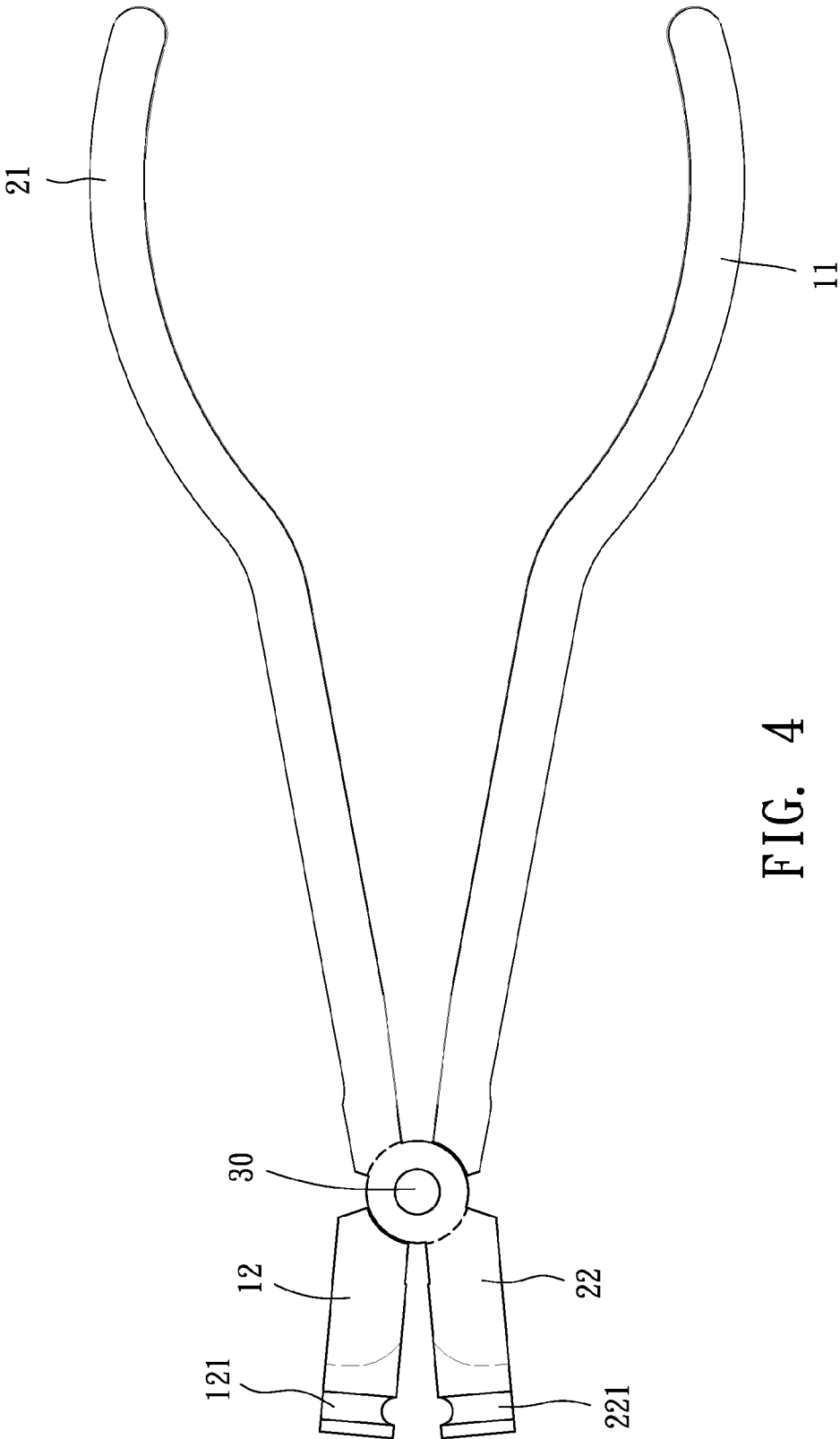


FIG. 4

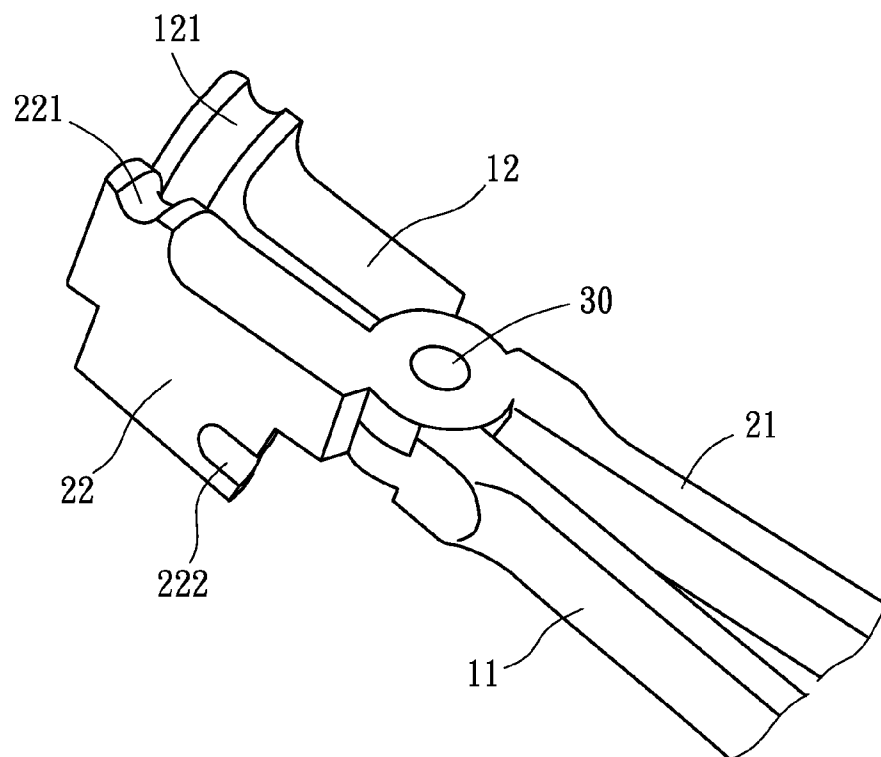


FIG. 5

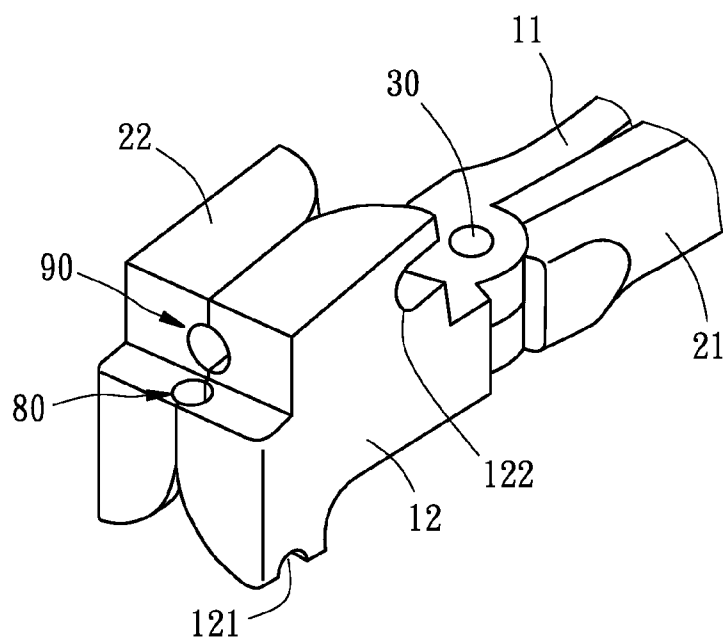


FIG. 6

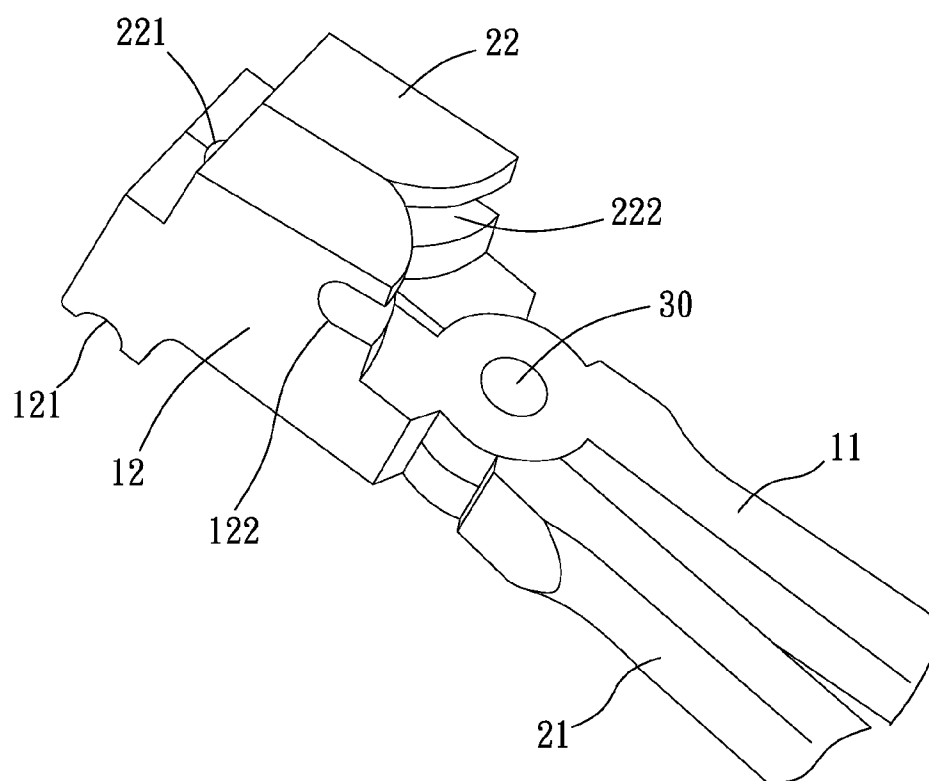


FIG. 7

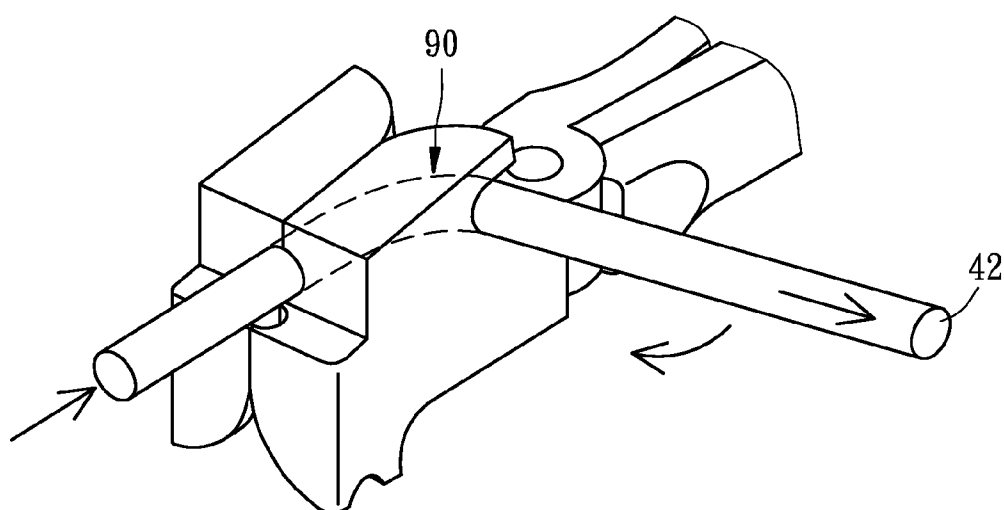


FIG. 8

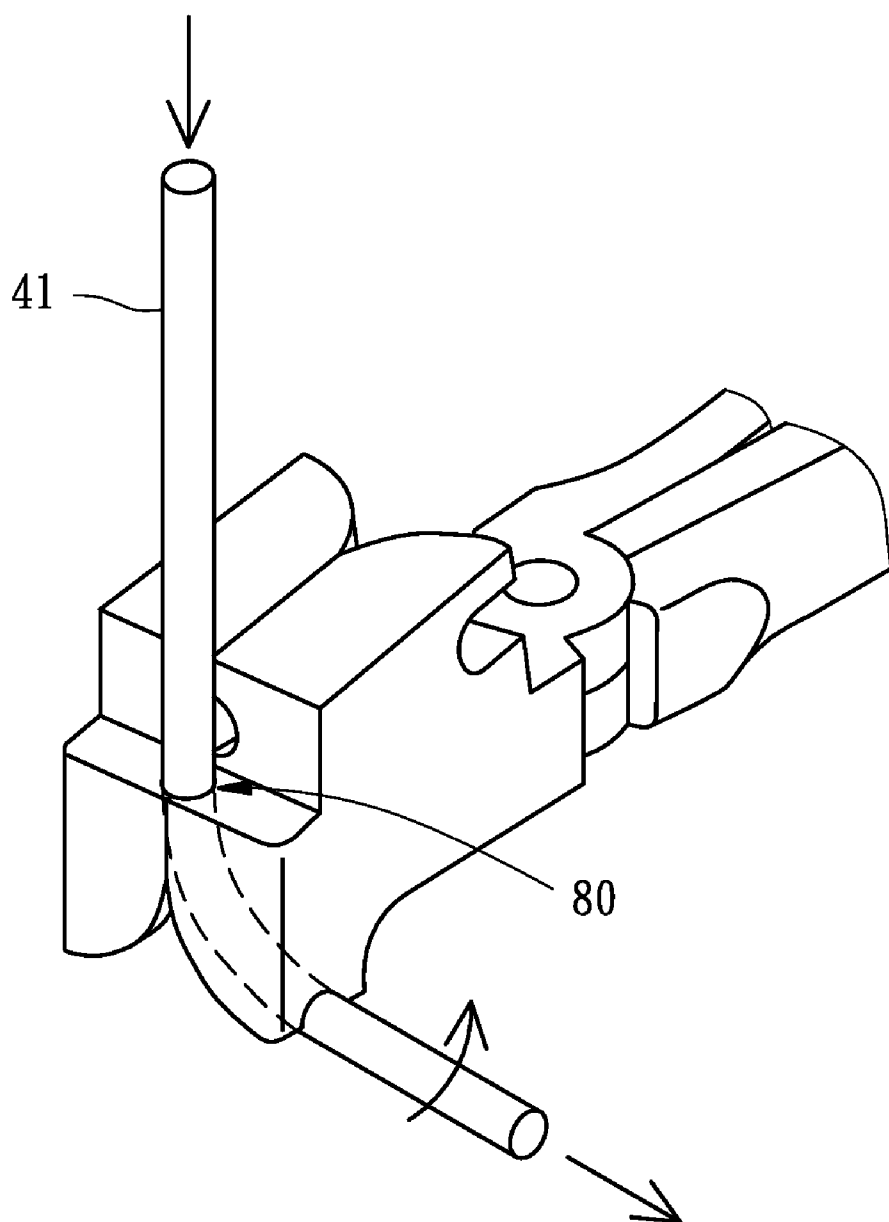


FIG. 9

## BIDIRECTIONAL PIPE BENDING PLIERS

### BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a pair of pliers, and more particularly to a pair of bidirectional pipe bending pliers.

[0003] 2. Description of the Prior Art

[0004] Conventionally, large-diameter pipe bending requires the use of professional pipe bending machine, while small-diameter pipe bending is normally carried out with manual pipe bending pliers. However, a pair of conventional pipe bending pliers is only provided for single direction bending and is only used for single sized pipe bending since the jaw size of the pipe bending pliers is not adjustable. Hence, different pipe bending pliers should be prepared when bending different sized pipes, causing inconvenience when carrying and using the pipe bending pliers.

[0005] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

### SUMMARY OF THE INVENTION

[0006] The primary object of the present invention is to provide a pair of bidirectional pipe bending pliers which is improved in convenience of use by being provided with bidirectional pipe-bending paths.

[0007] Another object of the present invention is to provide a pair of bidirectional pipe bending pliers which is capable of bending two differently sized pipe.

[0008] Therefore, a pair of bidirectional pipe bending pliers comprises: a first handle and a second handle.

[0009] The first handle includes a first handle portion, a first pipe-bending portion and a first pivoting portion connected between the first handle portion and the first pipe-bending portion, the first pipe-bending portion is formed with a first bending groove and a second bending groove.

[0010] The second handle includes a second handle portion, a second pipe-bending portion and a second pivoting portion connected between the second handle portion and the second pipe-bending portion, the second pipe-bending portion is formed with a third bending groove and a fourth bending groove, the second pivoting portion is pivotally connected to the first pivoting portion, so that the first and second pipe-bending portions are closed toward each other to carry out clamping operation by applying force to the first and second handle portions, when the first and second pipe-bending portions are closed toward each other to carry out clamping operation, the first and third bending grooves will define a first pipe-bending path therebetween, while the second and fourth bending grooves will also define a second pipe-bending path, the first and second pipe-bending paths extend in different axial directions.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a perspective view of a pair of bidirectional pipe bending pliers in accordance with the present invention;

[0012] FIG. 2 is a top view of the pair of bidirectional pipe bending pliers in accordance with the present invention;

[0013] FIG. 3 is a cross sectional view taken along the line 3-3 of FIG. 2;

[0014] FIG. 4 is a top view of the pair of bidirectional pipe bending pliers shown in FIG. 1;

[0015] FIG. 5 is a magnified view of a part of pair of bidirectional pipe bending pliers shown in FIG. 1;

[0016] FIG. 6 is another magnified view of the pair of bidirectional pipe bending pliers shown in FIG. 1 taken from another angle;

[0017] FIG. 7 is yet another magnified view of the pair of bidirectional pipe bending pliers shown in FIG. 1 taken from another angle;

[0018] FIG. 8 is an operational view showing how a small-diameter pipe is being bent by the pair of bidirectional pipe bending pliers in accordance with the present invention; and

[0019] FIG. 9 is another operational view showing how a big-diameter pipe is being bent by the pair of bidirectional pipe bending pliers in accordance with the present invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] The present invention will be clearer from the following description when viewed together with the accompanying drawings, which show, for purpose of illustrations only, the preferred embodiment in accordance with the present invention.

[0021] Referring to FIGS. 1-9, a pair of bidirectional pipe bending pliers in accordance with the present invention comprises: a first handle 10, a second handle 20 and a pivot member 30 for connecting the first and second handles 10, 20 together.

[0022] The first handle 10 includes a first handle portion 11, a first pipe-bending portion 12 and a first pivoting portion 13 connected between the first handle portion 11 and the first pipe-bending portion 12. The first handle portion 11 for user's grip is located at one end of the first handle 10, and the first pipe-bending portion 12 is located at another end of the first handle 10. Along an inner surface of the first pipe-bending portion 12 are formed a semicircular first bending groove 121 and a semicircular second bending groove 122. The first bending groove 121 linearly extends a predetermined distance from a bottom side surface of the first pipe-bending portion 12 and then extends in an arc-shaped manner to the right edge of the top side surface of the first pipe-bending portion 12. The second bending groove 122 extends linearly a predetermined distance from the front side surface of the first pipe-bending portion 12 and then extends in an arc-shaped manner to the right edge of the rear side surface of the first pipe-bending portion 12. Namely, the first bending groove 121 extends in the bottom-and-top direction of the first pipe-bending portion 12, and the second bending groove 122 extends in the front-and-rear direction of the first pipe-bending portion. The first pivoting portion 13 is a circular hole.

[0023] The second handle 20 includes a second handle portion 21, a second pipe-bending portion 22 and a second pivoting portion 23 connected between the second handle portion 21 and the second pipe-bending portion 22. The second handle portion 21 for user's grip is located at one end of the second handle 20, and the second pipe-bending portion 22 is located at another end of the second handle 20. Along an inner surface of the second pipe-bending portion 22 are formed a semicircular third bending groove 221 with a diameter equal to that of the first bending groove 121 and a semicircular fourth bending groove 222 with a diameter larger than that of the third bending groove 221 and equal to that of the second bending groove 122. The third bending groove 221 linearly extends a predetermined distance from a bottom side surface of the second pipe-bending portion 22 and then extends in an arc-shaped manner to the left edge of the top side surface of the second pipe-bending portion 22. The fourth bending groove 222 linearly extends from the front side surface a predetermined distance and then extends in an



arc-shaped manner to the left edge of the rear side surface of the second pipe-bending portion 22. Namely, the third bending groove 221 extends in the bottom-and-top direction of the second pipe-bending portion 22, while the fourth bending groove 222 extends in the front-and-rear direction of the second pipe-bending portion 22. The second pivoting portion 23 is a circular hole.

[0024] The pivot member 30 is a round rod (as shown in FIGS. 1-4) inserted in the first and second pivoting portion 13, 23 of the first and second handles 10, 20 to pivotally connect the first and second handles 11, 12 together, so that the first and second pipe-bending portions 12, 22 can be opened and closed by pivoting motion. When the first and second pipe-bending portions 12, 22 are closed toward each other to carry out clamping operation, as shown in FIG. 6, the first and third bending grooves 121, 221 will define a first pipe-bending path 80 therebetween, while the second and fourth bending grooves 122, 222 will also define a second pipe-bending path 90 therebetween which crosses the first pipe-bending path 80. Furthermore, the first pipe-bending path 80 is smaller in diameter than the second pipe-bending path 90.

[0025] The abovementioned are the structural relations of the respective components of the directional pipe bending pliers in accordance with the present invention, and the operation and effect of the present invention are described as follows.

[0026] As shown in FIG. 9, when bending a small-diameter pipe 41, the user can insert it in the first pipe-bending path 80 and then bend the end of the pipe 41 toward the first bending groove 121 or the third bending groove 221, so that the pipe 41 can be bent into a desired angle along the first or third bending grooves 121, 221.

[0027] Referring then to FIG. 8, when bending a large-diameter pipe 42, the user can insert the pipe 42 in the second pipe-bending path 90 and bend the end of the pipe 42 toward the second or fourth bending grooves 122, 222, so that the pipe 42 can be bent into a desired angle along the second or fourth bending grooves 122, 222.

[0028] Hence, the pair of bidirectional pipe bending pliers in accordance with the present invention is capable of bending two different sized pipes by providing the first and second pipe-bending paths 80, 90, namely, bidirectional and different sized pipe-bending paths. Besides, the pair of bidirectional pipe bending pliers in accordance with the present invention provides more use options since the first and second pipe-bending paths 80, 90 extend in different axial directions (cross each other).

[0029] In addition, the above-mentioned embodiment is such that the pivot member 30 is pivotally inserted in the first and second pivoting portions 13, 23 of the first and second handles 10, 20, however, the first pivoting portion 13 can also be in the form of a circular hole and the second pivoting portion 23 can take the form of a protruding portion, or vice versa, the first pivoting portion 13 takes the form of a protruding portion and the second pivoting portion 23 takes the form of a circular hole, and thus the first and second handles 10, 20 can be pivotally connected each other with the use of the pivot member 30.

[0030] While we have shown and described various embodiments in accordance with the present invention, it is clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A pair of bidirectional pipe bending pliers, comprising:
  - a first handle including a first handle portion, a first pipe-bending portion and a first pivoting portion connected between the first handle portion and the first pipe-bending portion, the first pipe-bending portion being formed with a first bending groove and a second bending groove;
  - a second handle including a second handle portion, a second pipe-bending portion and a second pivoting portion connected between the second handle portion and the second pipe-bending portion, the second pipe-bending portion being formed with a third bending groove and a fourth bending groove, the second pivoting portion being pivotally connected to the first pivoting portion, so that the first and second pipe-bending portions are closed toward each other to carry out clamping operation by applying force to the first and second handle portions, when the first and second pipe-bending portions are closed toward each other to carry out clamping operation, the first and third bending grooves will define a first pipe-bending path therebetween, while the second and fourth bending grooves will also define a second pipe-bending path, the first and second pipe-bending paths extend in different axial directions.
2. The pair of bidirectional pipe bending pliers as claimed in claim 1, wherein the first, second, third and fourth bending grooves are semicircular-shaped.
3. The pair of bidirectional pipe bending pliers as claimed in claim 1, wherein along an inner surface of the first pipe-bending portion are formed the first and second bending grooves, the first bending groove linearly extends a predetermined distance from a bottom side surface of the first pipe-bending portion and then extends in an arc-shaped manner to a right edge of a top side surface of the first pipe-bending portion, the second bending groove extends linearly a predetermined distance from a front side surface of the first pipe-bending portion and then extends in an arc-shaped manner to a right edge of a rear side surface of the first pipe-bending portion, along an inner surface of the second pipe-bending portion are formed a third bending groove and a semicircular fourth bending groove, the third bending groove linearly extends a predetermined distance from a bottom side surface of the second pipe-bending portion and then extends in an arc-shaped manner to a left edge of a top side surface of the second pipe-bending portion, the fourth bending groove linearly extends from a front side surface a predetermined distance and then extends in an arc-shaped manner to a left edge of a rear side surface of the second pipe-bending portion.
4. The pair of bidirectional pipe bending pliers as claimed in claim 1, wherein the first bending groove extends in a bottom-and-top direction of the first pipe-bending portion, and the second bending groove extends in a front-and-rear direction of the first pipe-bending portion, the third bending groove extends in a bottom-and-top direction of the second pipe-bending portion, while the fourth bending groove extends in a front-and-rear direction of the second pipe-bending portion.
5. The pair of bidirectional pipe bending pliers as claimed in claim 1, wherein the third bending groove has a diameter equal to that of the first bending groove, and the fourth bending groove has a diameter larger than that of the third bending groove and equal to that of the second bending groove.