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(54) **Fast open compass**

(57) A fast open compass comprises one handle (1), a joint part (8) and two legs (21, 22) connected to the joint part. There is a screw thread between the legs. The screw has left spin screw thread and right spin screw thread. There are nuts (41, 42) on the legs that can be connected to the left spin screw thread and the right spin screw thread, respectively. Thread of the screw (3) is selected in such manner that the coupling between screw and nuts is reversible. The angle of the left spin screw thread and the right spin screw thread of the screw is advantageously 20–35°. When legs are been unfold or fold directly, the left spin screw thread (31) and the right spin screw thread of the screw can be unlocked and moved against each respective nuts. This invention uses an adjustable screw between legs with a relatively large rise angle. This make it possible to apply relatively small force to overcome the resistance to pull the screw out of or push it into the nuts straight way. Therefore, a precise and fast positioning is possible.

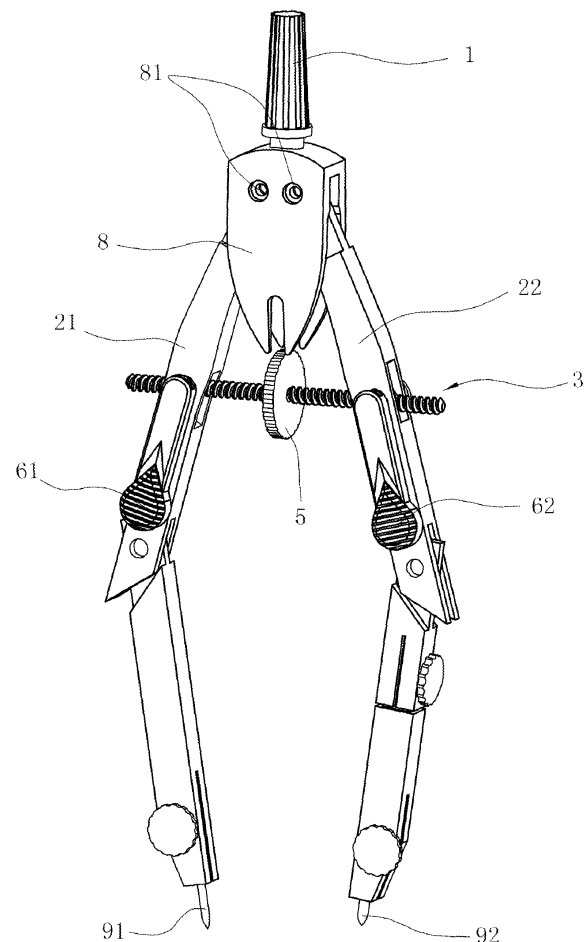


Fig.2

Description

[0001] The present invention relates to a new practical compass.

[0002] Ordinary compasses usually are composed of a handle and two legs which are connected with the handle; there is a needle seat on bottom of one leg and a drawing pen or pencil seat on the other. Fix the needle as the centre of the circle, and then rotate the handle to draw arc with the drawing pen.

[0003] However, it is difficult, so far, for ordinary compass to measure the exact radius of the arc. When the distance between two legs is increased to draw a larger circle, two legs of the compass have to lean very close to the drawing board. The drawer by holding and spinning the handle, on the one hand have to control the radius of the arc, on the other hand have to control the pressure applied on both draw pen and needle. If the force applied on the needle is too great, will make it hard to rotate the handle, even cause the needle point to depart from its original position, the heart of the circle, and then reduce the accuracy of the drawing.

[0004] Therefore, a new Chinese application n.98241987.2, publish a compass that is easy to position. It is composed with two legs and axes on top of the legs. On top of one leg, there is a positioning axes. On one side of the position axes, there is a sliding gear, which could rotate around the position axes. There is a long hole on the sliding gear, and there is a screw on the other leg. There is a bolt to connect the long hole on the sliding gear and the screw on the other leg.

[0005] But the patented compass described above is imperfect in relation to the design of the long hole on the position axes. Once put on use, one will find the bolt will slide along the long hole, make it hard to position with precision, and make it impossible to precise adjust of the degree of the opening of the compass. Every time, one has to loosen the bolt before use and has to tighten it afterwards. It makes fast position not possible.

[0006] Compasses are also known with a transversal screw between the legs rotatable with a central wheel for fine positioning. Coupling between screw and nuts on the legs is irreversible. These compasses are slow to open and close. Disengaging elements can be provided between leg and screw, but in this case the movement of the legs become uncontrollable and fast and precise adjustment is impossible.

[0007] Therefore, due to the inconvenience of the compasses in actual use, there is room for improvement.

[0008] The technical difficulty this invention is aimed to solve is to provide a fast position compass based on currently available technology. With this compass, fast, accurate positioning and fine-turning regarding the control of the distance between legs of the compass are possible.

[0009] In view of the above aim, in accordance with the invention, a fast open compass comprising a handle; a joint part which is connected to the handle; two legs

that are connected to the joint part through a hinge; an adjusting screw between the said legs; and on both sides of the screw there are screw threads, left spin screw thread and right spin screw thread, respectively connected to nuts on both legs, **characterized in that** the angle of the left spin screw thread and the right spin screw thread of the screw is selected in such manner that the coupling between screw and nuts is reversible, so that when legs are been unfold or fold directly, the left spin screw thread and the right spin screw thread of the screw can be unlocked and rotated in each respective nuts.

[0010] Advantageously, the angle is in the range of 20-35°.

[0011] To pull the screw fast and further minimize resistance, the left spin screw thread and right spin screw thread are designed in triple-start thread with teeth of trapezoidal shape.

[0012] To make it easier to rotate the screw and to allow precise adjustment of the degree of the opening of the compass, there is an around adjusting wheel in the middle of the screw to divide the left spin screw thread and right spin screw thread.

[0013] To open the legs fast, to make fast position possible, there is a presser foot which could adjust the gap between nuts and screw, and could connect the screw and nuts without the using screw thread.

[0014] One side of the presser foot is connected to the screw thread of the nut and the other side is connected to a spring on the leg. When one side of the presser foot is on rest position, the nuts are connected to the screw. When one side of the presser foot is pressed, the nut departs from the screw.

[0015] Compared with the currently available technology, this invention have two outstanding features:

- there is an adjustable screw between the legs with a relatively large (reversible) rise angle used in the design of this screw (advantageously, about 20~35°) this make it possible to apply relatively small force to overcome the resistance to pull the screw out of or push it into the nuts straight way, therefore fast positioning is possible; and
- the screw is comprised of a left spin screw thread and a right spin screw thread, in between two, there is an adjusting wheel, by rotating the adjusting wheel one could rotate the screw, it makes precise adjustment of the degree of the legs possible.

[0016] For better clarifying the innovative principles of the present invention and the advantages it offers as compared with the known art, a possible embodiment applying said principles will be described hereinafter by way of non-limiting example, with the aid of the accompanying drawings. In the drawings:

- Figure 1 is an illustration of a solid configuration of the invention.
- Figure 2 is illustration of the invention in use.

- Figure 3 is an illustration of how screw and nut of the invention work together.
- Figure 4 shows the configuration of a screw of the invention.
- Figure 5 shows the configuration of a nut of the invention.

[0017] Together with the diagrams showed below, a more specified illustration of the invention is disclosed hereinafter.

[0018] As showed in figures, this invention is a new fast open compass.

[0019] As showed in figure 1 and figure 2, the fast open compass comprises a joint part 8. On top of the joint part, there is a handle 1 for user to hold. The joint part 8 has two screw thread holes 81 and two legs 21, 22 connected with the joint part 8 by the bolt which goes through the screw thread holes 81.

[0020] At the same time, there is an adjusting screw 3 placed between two legs 21, 22.

[0021] The legs 21,22 comprise a top part and a bottom part. Between the top part and bottom part there is a bendable hinge. The use of hinge could keep the leg vertical against the drawing board, therefore avoiding some problems that would occur while using the compass, for example the centre of circle often moves, the radius of the circle increases and the precision lowers.

[0022] The two legs 21 22 are respectively connected with needle 91, that is used to fix the centre of the circle, and pen 92, which is used to draw circle.

[0023] As showed in figure 3, 4 and 5, the screw 3 is divided into right and left parts, with left spin screw thread and right spin screw thread on them respectively.

[0024] In the middle of screw 3, there is an adjusting wheel 5 that could be used to rotate the screw, see figure 4.

[0025] There are nuts 41, 42 respectively on the legs 21,22 designed to suit screw 3. The nuts 41,42 are connected with the left spin screw thread 31 and the right spin screw thread 32 respectively.

[0026] The rise angle of the screw is selected in such manner that the coupling between screw and nuts is reversible. When the legs 21,22 are fold or unfold, the left spin screw thread 31 and the right spin screw thread 32 of the screw 3 could be unlocked and move against each respective nuts 41,42.

[0027] Advantageously, the rise angle of the left spin screw thread 31 and right spin screw 32 of the screw 3 is 20-35° (in particular 25-30° and, preferably, about 28°). This angle is larger than the angle of an ordinary irreversible fix connecting screw thread.

[0028] There are presser feet or lever on nuts 41,42 that could adjust the gap between the nuts 41,42 and screw 3, see figure 3. One side of the presser feet 61,62 is connected to the screw thread of the nuts 41,42, other side (button or command side) of the presser feet is connect to the springs 71,72 on the legs 21, 22. When side of the presser foot is on rest or natural position, the nut

(41,42) is connected to the screw (3). When a button or command side of the presser foot (61,62) is pressed, the nut (41,42) will depart from the screw.

[0029] Figure 5 is an illustration of structure of the nuts 41, 42 of the invention. One side of the nut is open end 411 (421), other side 412 (422) connected to the presser foot 61, 62, there are inner screw thread 413 (423) on the open end 411 (421) of nuts 41, 42 which could be use to connect respectively with left spin screw thread 31 and right spin screw thread 32. The open end 411 (421) of the nuts 41,42 is vertical to the screw 3.

[0030] At this point it is apparent that the intended purposes are achieved. This invention use an adjustable screw between legs and a relatively large rise angle is used in the design of this screw. This make it possible to apply relatively small force to overcome the resistance to pull the screw out of or push it into the nuts straight way, therefore it making possible a fast and precise guided positioning. When the very fine movement of the legs is wished, the wheel 5 is manually rotated. When a more fast movement is wished, the legs can be pulled or pushed and the reversible coupling between the screw 3 and nuts 41, 42 causes corresponding rotation of the screw 3. However, the "frictional" effect of the reversible coupling aids the precise positioning of the leg ends. Moreover, this effect avoids the uncontrolled free movement of the legs when the compass is in use. In particular, the effect is better when it has an angle in the range of 20-35°.

[0031] For very fast movements, the presser foot can be used.

[0032] Obviously, the above description of an embodiment applying the innovative principles of the present invention is given by way of example only and therefore must not be considered as a limitation of the scope of the patent rights herein claimed.

Claims

1. A fast open compass comprising:

- a handle (1);
- a joint part (8) which is connected to the handle;
- two legs (21,22) that are connected to the joint part(8) through a hinge;
- an adjusting screw (3) between the said legs (21,22); and
- on both sides of the screw (3) there are screw threads, left spin screw thread (31) and right spin screw thread (32), respectively connected to nuts (41,42) on both legs (21,22),

characterized in that the angle of the left spin screw thread (31) and the right spin screw thread (32) of the screw (3) is selected in such manner that the coupling between screw and nuts is reversible, so that when legs (21,22) are been unfold or fold direct-

ly, the left spin screw thread (31) and the right spin screw thread (32) of the screw (3) can be unlocked and rotated in each respective nuts (41,42).

2. Compass as described in claim 1, **characterized in that** the angle of the screw thread is in the range of 20-35°. 5

3. Compass as described in claim 1, **characterized in that** the left spin screw thread (31) and the right spin screw thread (32) are triple-start thread with teeth of trapezoidal shape. 10

4. Compass as described in claim 1, **characterized in that** between the left spin screw thread (31) and the right spin screw thread (32) there is an adjusting wheel (5) that can be used to rotate the screw. 15

5. Compass as described in claim 1, 2, 3 or 4 **characterized in that** presser feet are placed between the nuts and the screw and are connected to the said nuts (41,42). 20

6. Compass as described in claim 5, **characterized in that** one side of the presser foot (61,62) is connected to the screw thread of the nut (41,42) and the other side is connected to a spring (71,72) on the leg (21,22) ,when the side of the presser foot is on rest position the nut (41,42) is connected to the screw (3) and when a command side of the presser foot(61,62) is pressed the nut (41,42) departs from the screw. 25 30

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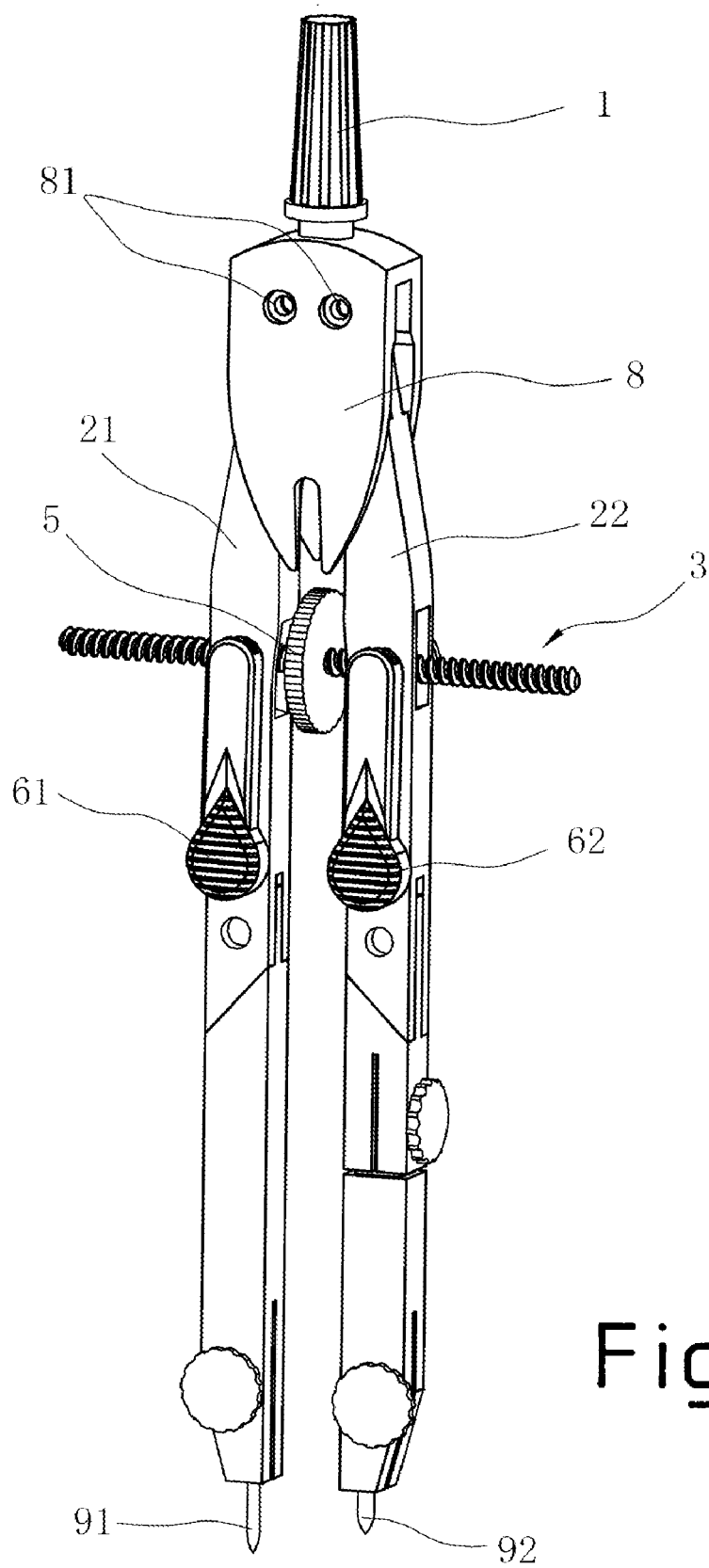


Fig.1

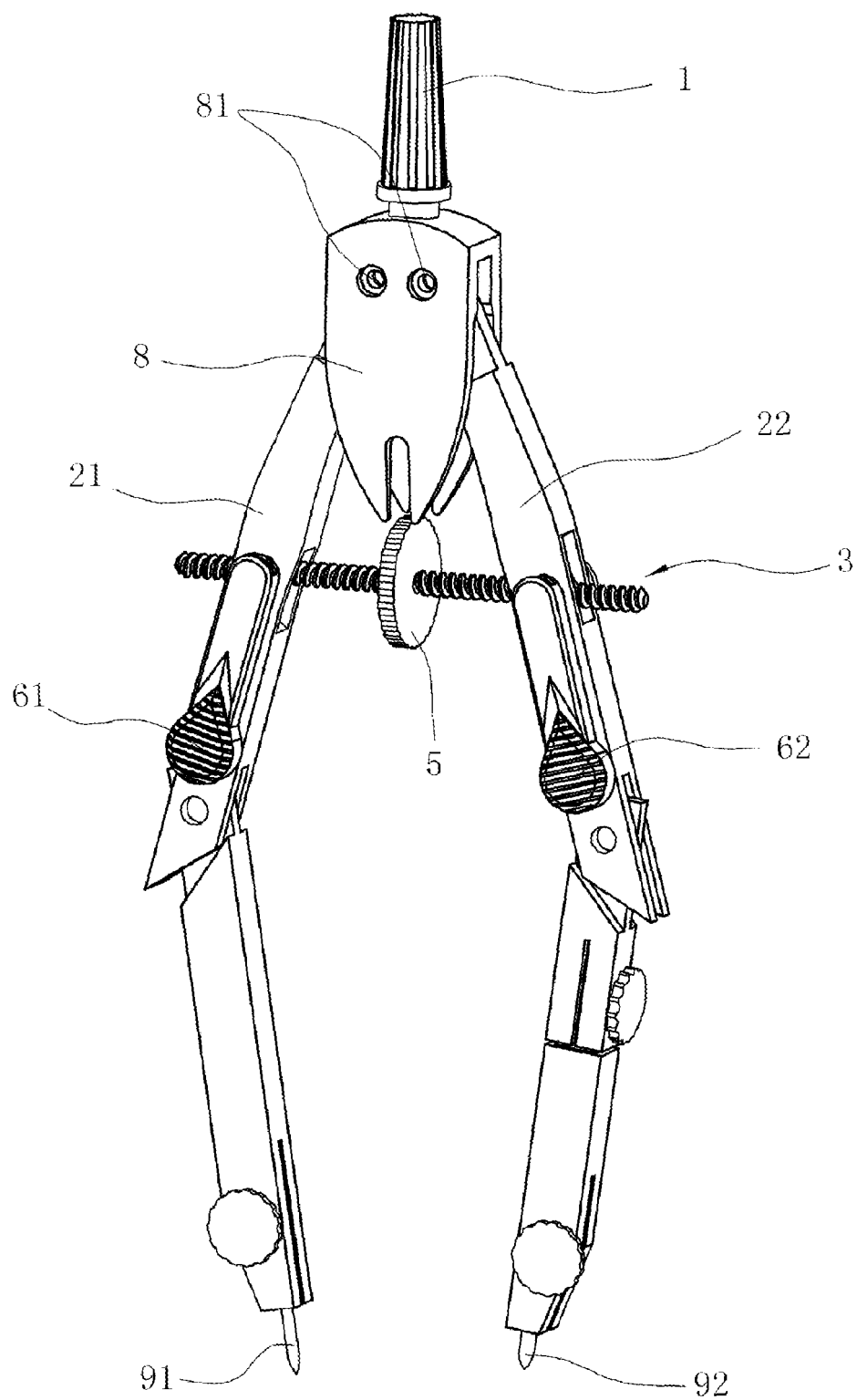


Fig.2

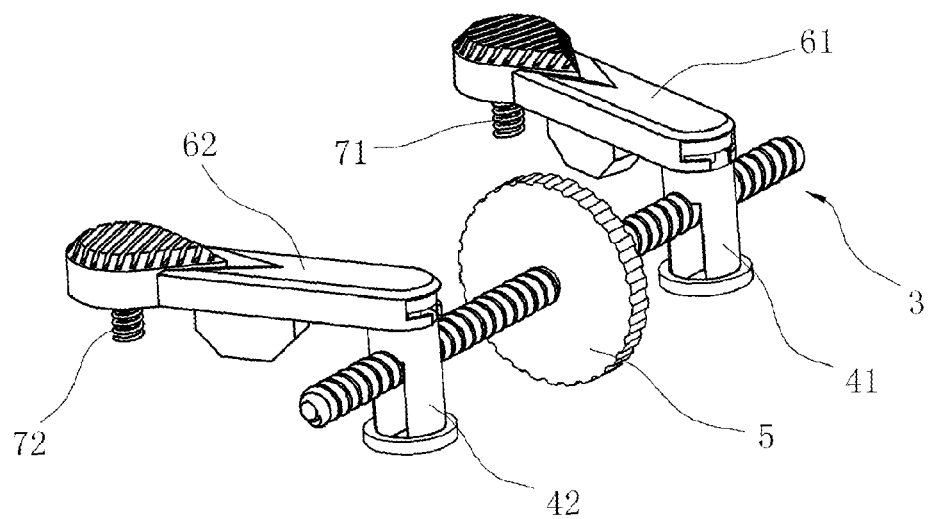


Fig. 3

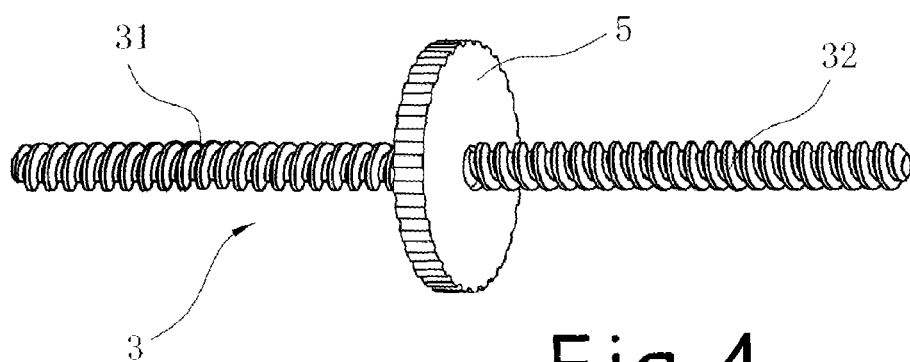


Fig. 4

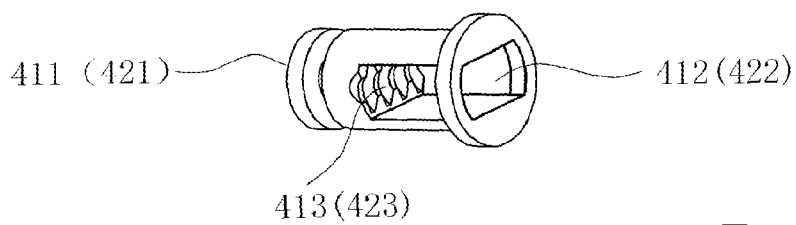


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 98241987 [0004]