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(54) **CLAMP STRUCTURE**

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(57) **ABSTRACT**

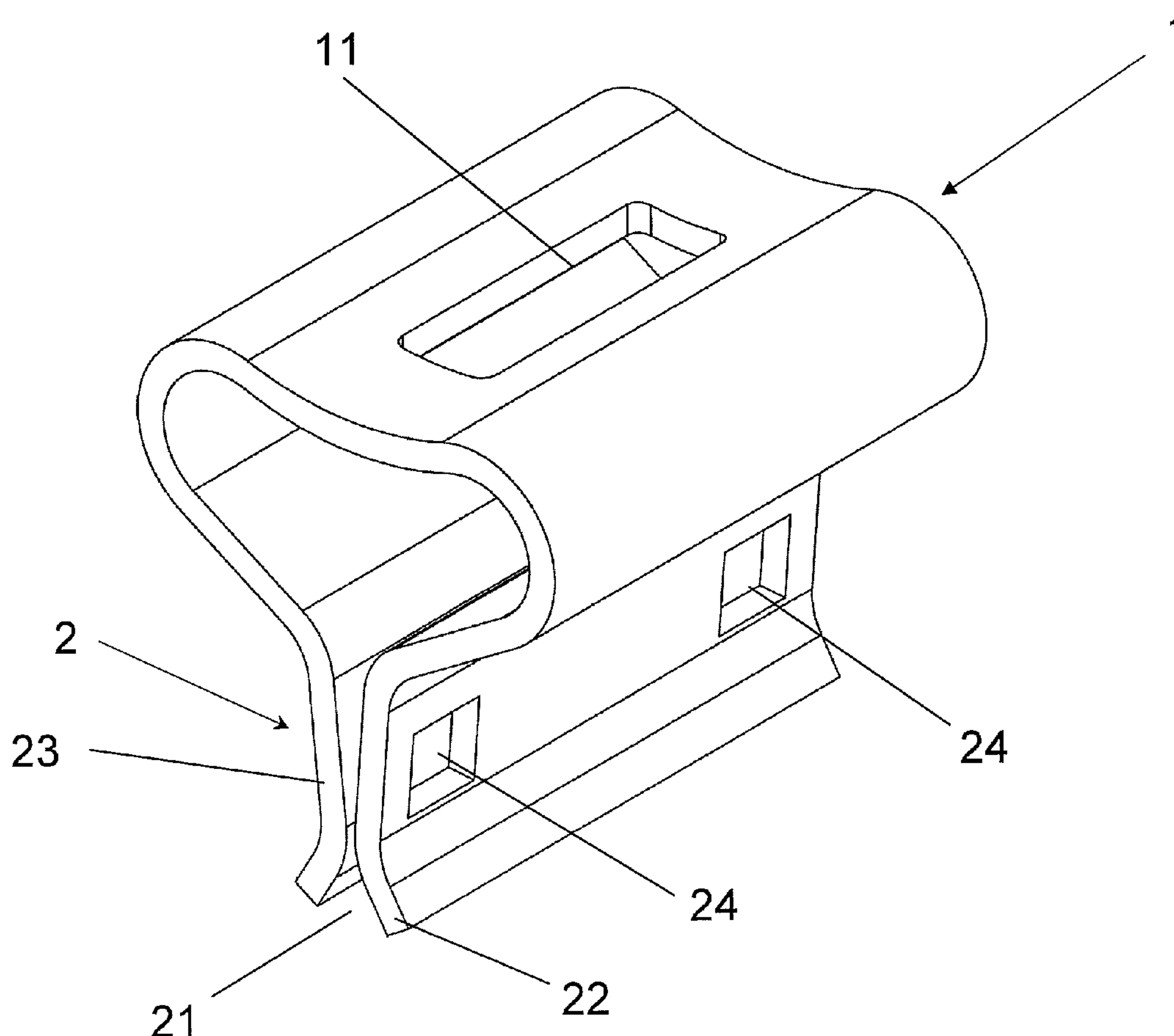
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A clamp structure includes a base plate and a pair of jaws. The jaws extend respectively from two transverse sides of the base plate and form a jaw opening opposite to the base plate. An aperture is formed longitudinally in the center of the base plate, wherein the transverse width the aperture is wider than the jaw opening. Therefore, the workers can connect the conductive terminals and the ribbon conveniently by pulling them out from inside of the clamp structure.

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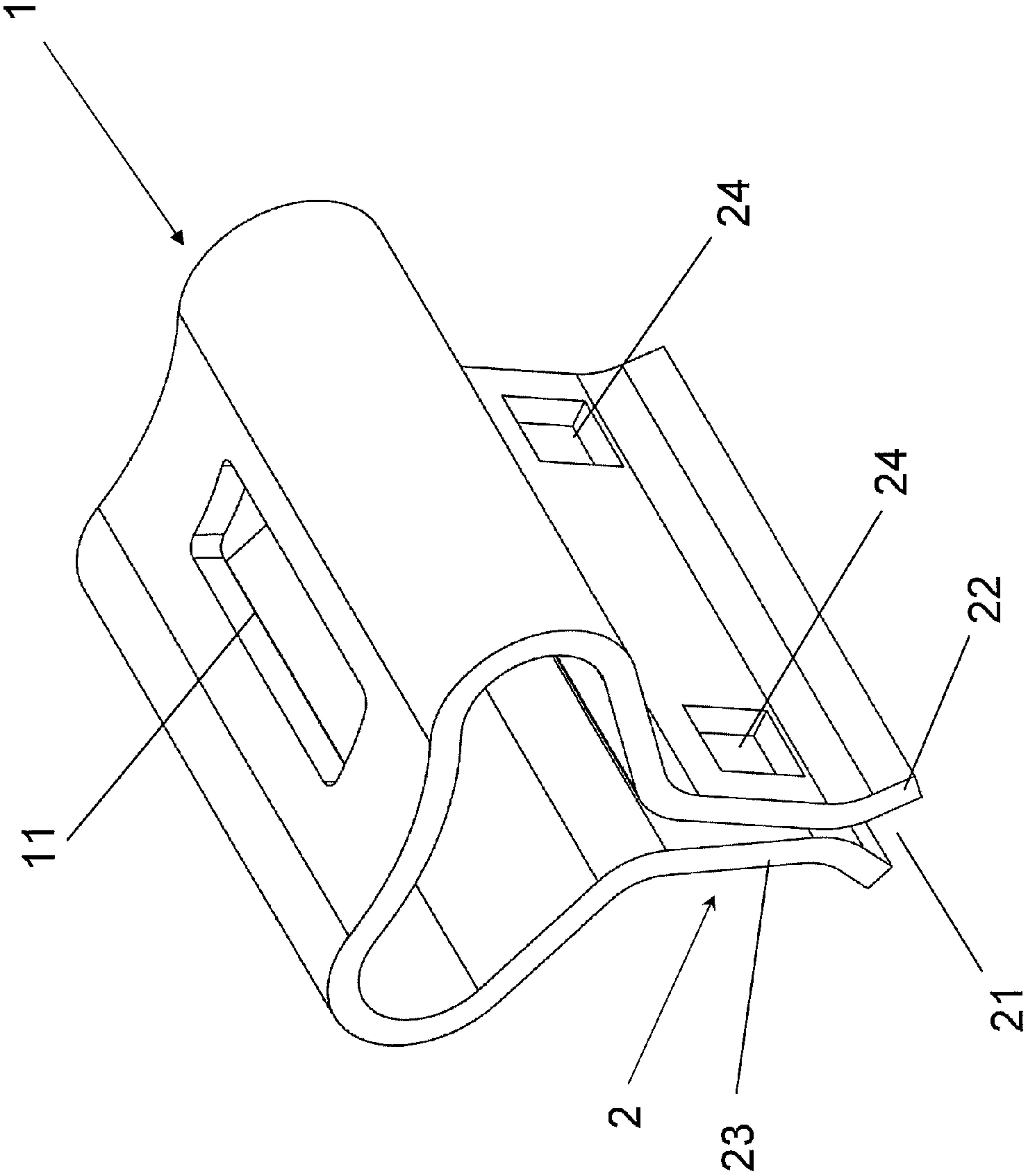


Fig.1

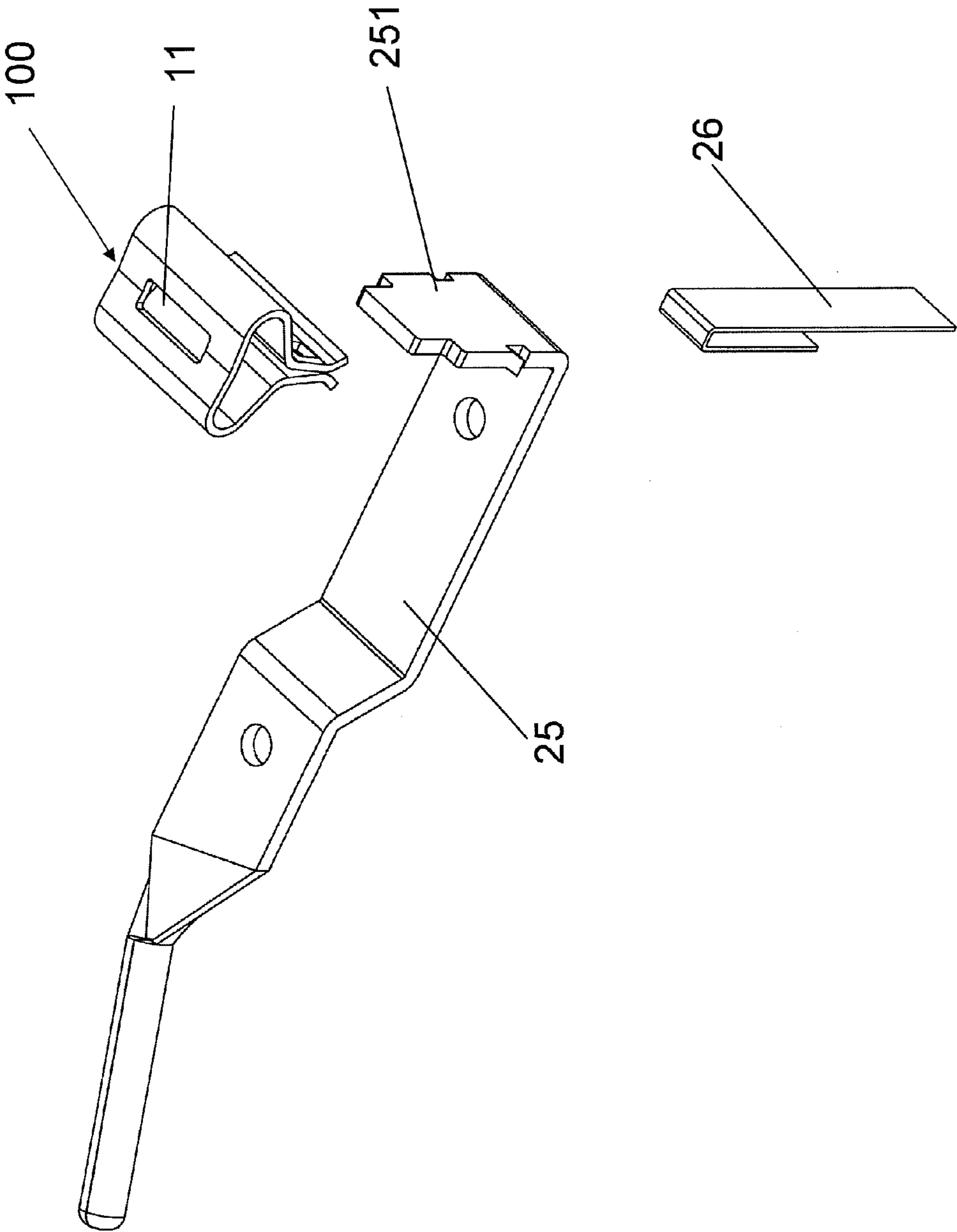


Fig.2

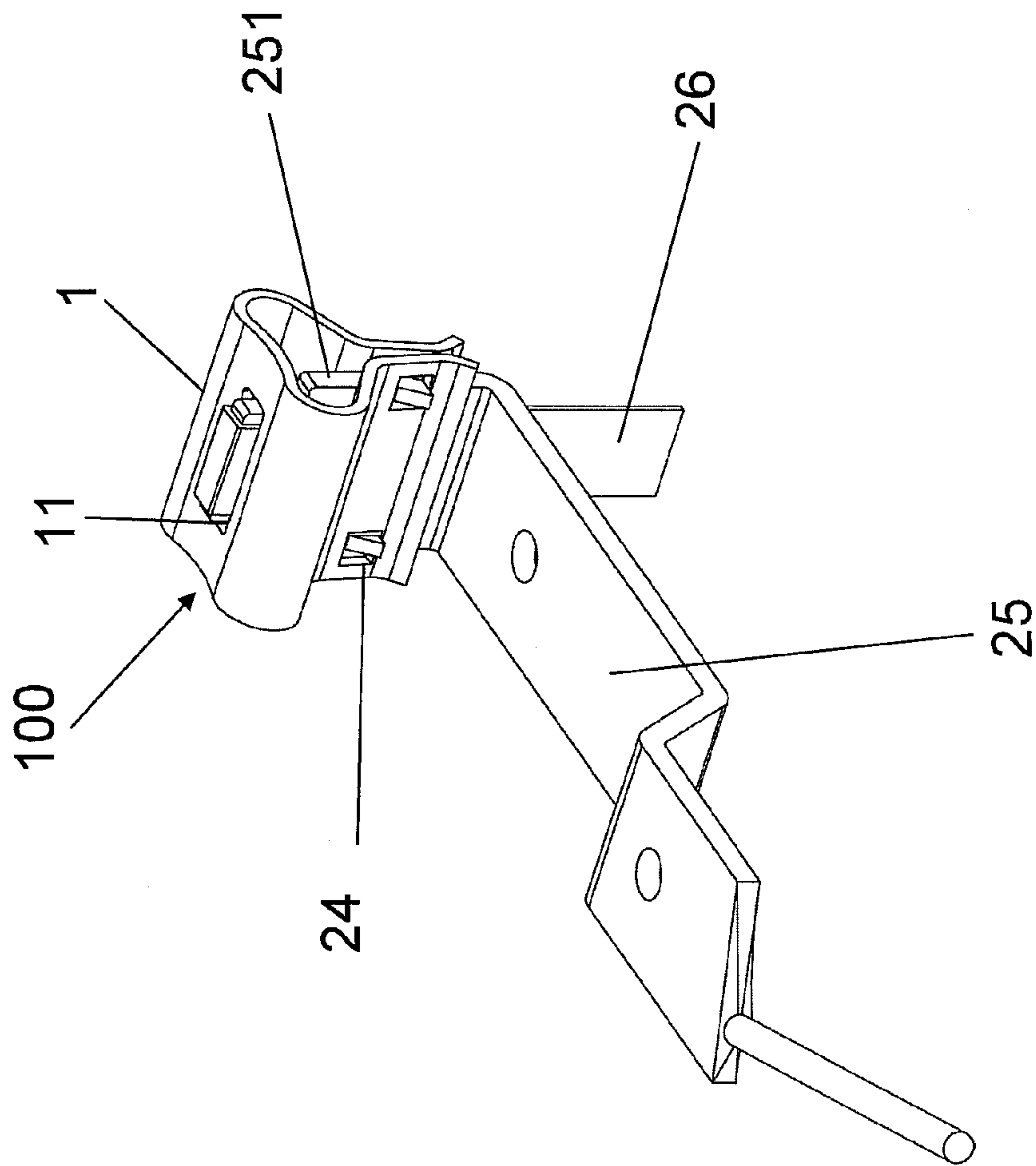
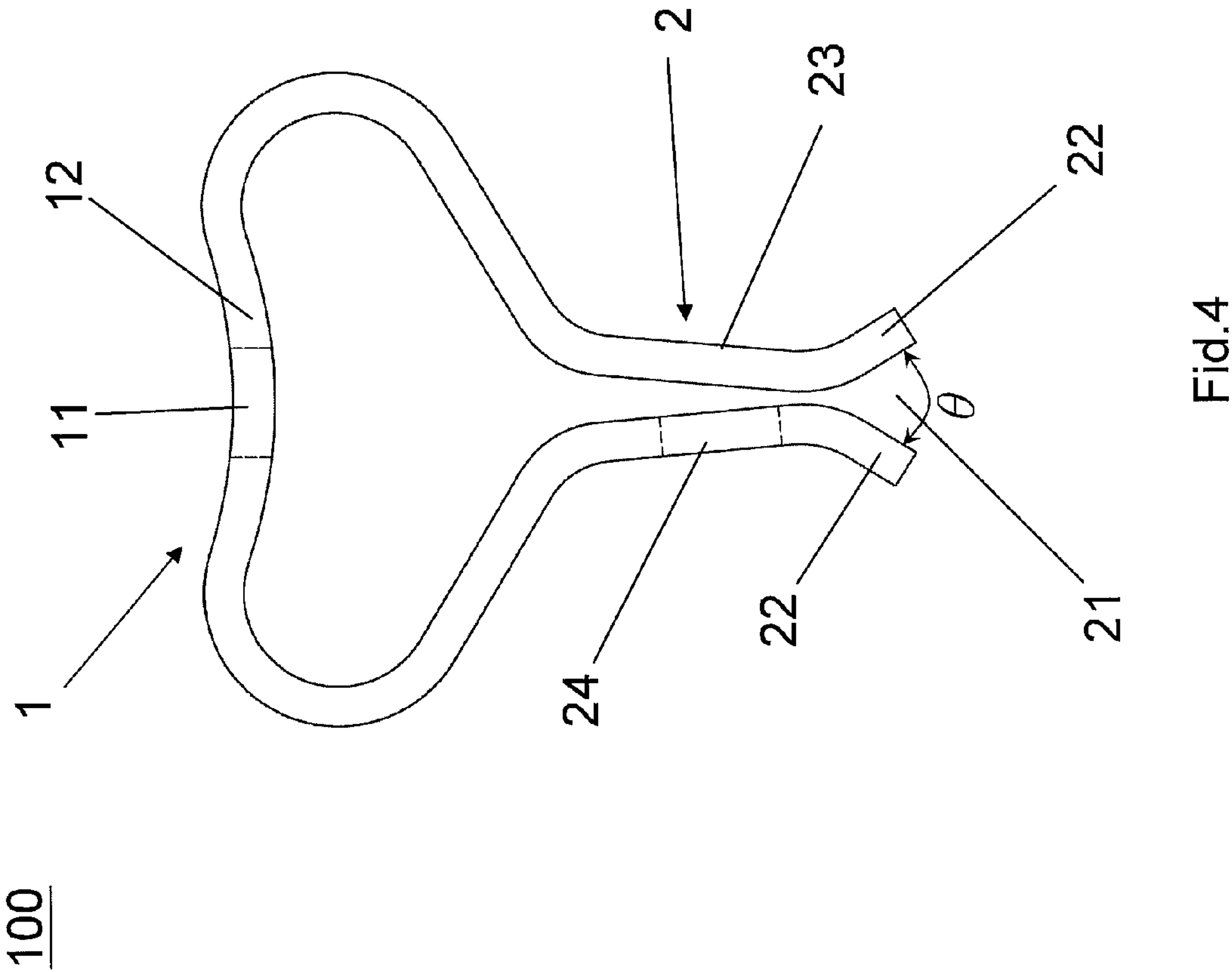


Fig.3



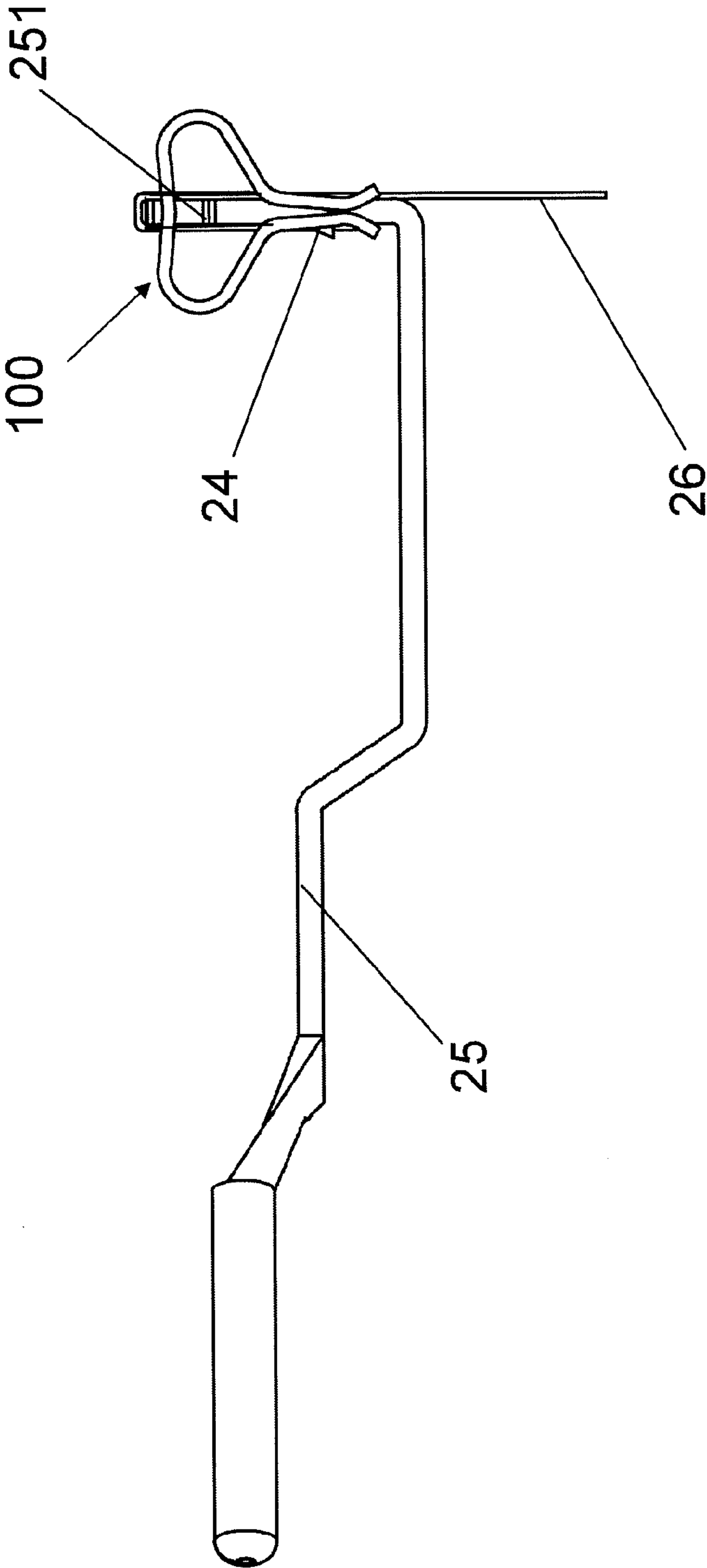


Fig. 5

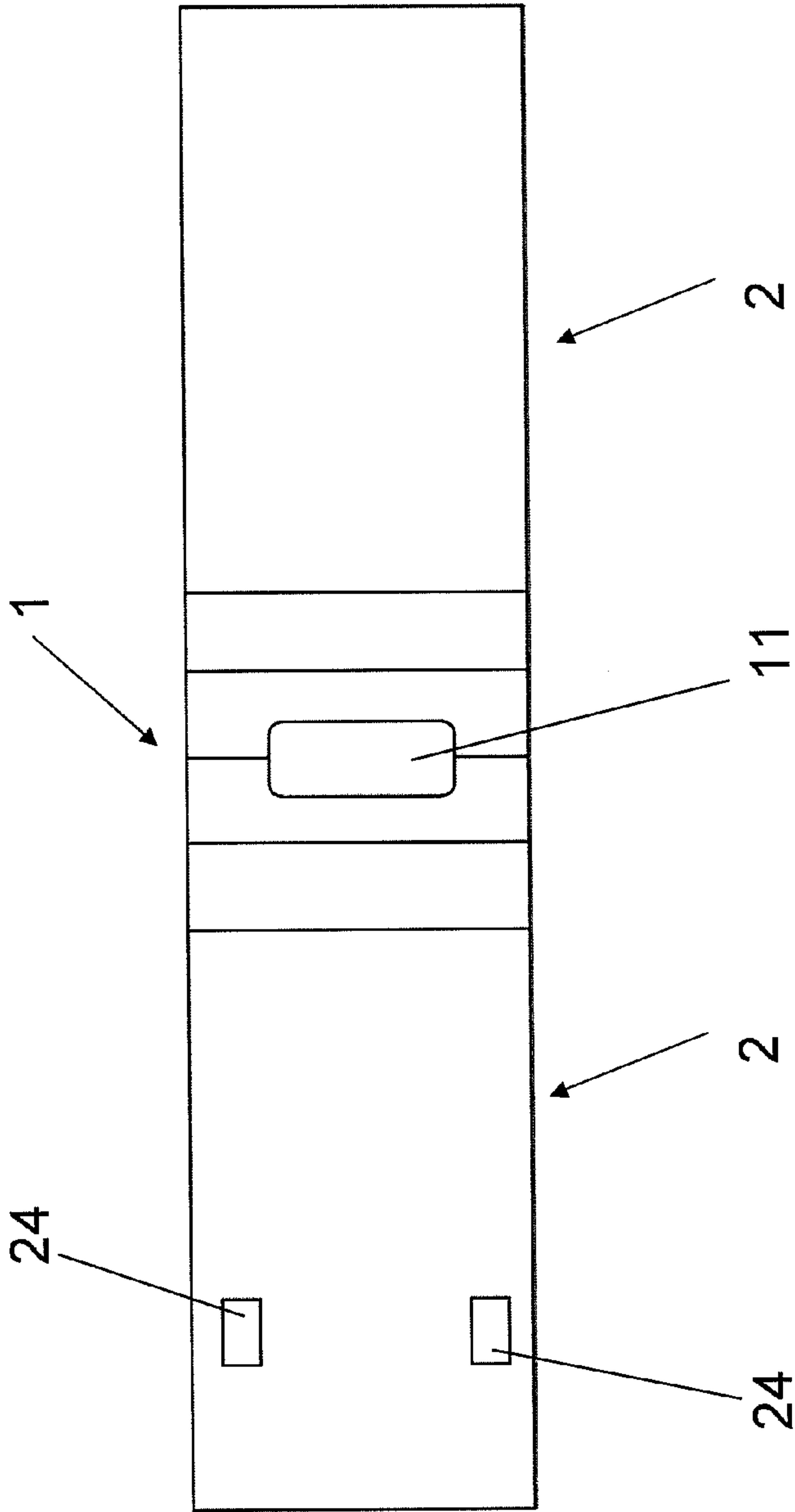


Fig.6

CLAMP STRUCTURE

BACKGROUND OF THE INVENTION

[0001] 1. Technical Field

[0002] The present invention relates to a clamp structure and, in particular, to a clamp structure used for connecting the conductive ribbon and the conductive terminal.

[0003] 2. Description of Related Art

[0004] With an increasing shortage of modern energy, the development of new energy sources—such as the solar cell—has drawn great attention from the international community. The solar cell has a plurality of advantages such as environmental friendliness, energy saving, and a wide application range. Also, the solar cell technology is currently more mature than any other alternative new energy technologies. However, the improvement of solar cell performance is still the common goal in the industry. For example, the junction box is an important part in the solar cell assembly. It is used for gathering and outputting the electricity produced by the solar cell. The solar cell assembly can't output the electricity normally nor work out its electricity generating function without the junction box.

[0005] The conductive terminal of the junction box has to be connected to the conductive ribbon of the solar panel. The solar cell assembly must be placed outdoors so that the conductive ribbon disconnected from the terminal easily by the outside influence. In that case, the power output of the solar cell will be interrupted. In the prior art, a clamp structure is used for fixing the conductive ribbon to the conductive terminal of the junction box. Then they are connected by welding or adhering for strengthening the stability of the connection therebetween and ensuring the power delivering normally.

[0006] However, in the prior art, when the workers work on the connecting of the conductive ribbon and the terminal, they can hardly observe the junction area inside the clamp structure. What's more, the welding or adhering tool can't be inserted easily into the clamp structure to achieve the connection. These difficulties lead to insufficient connection between the conductive ribbon and the terminal, so that the conductive ribbon disconnected from the terminal easily and the power output of the solar cell will be interrupted. Therefore, it is an important issue to develop a novel clamp structure for the workers to connect the conductive ribbon to the terminal efficiently and conveniently without mistakes.

[0007] In view of the above, it is a goal of research and development in the relevant industry to overcome the shortcomings of the clamp structure in the prior art for connecting the conductive terminal and the conductive ribbon with increasing convenience and lower cost.

BRIEF SUMMARY OF THE INVENTION

[0008] To overcome the foregoing technical shortcomings of the prior art, the present invention provides a novel clamp structure. The clamp structure includes a base plate and a pair of jaws. The jaws extend respectively from two transverse sides of the base plate and form a jaw opening opposite to the base plate. The clamp structure is characterized in having an aperture formed longitudinally in the center of the base plate, and the transverse width the aperture is wider than the jaw opening.

[0009] The primary objective of the present invention is to provide a novel clamp structure for the workers to connect the

conductive terminals and the ribbon conveniently. The clamp structure includes the base plate and the pair of jaws. The jaws extend respectively from two transverse sides of the base plate and form the jaw opening opposite to the base plate. The clamp structure has the aperture formed longitudinally in the center of the base plate, and the transverse width the aperture is wider than the jaw opening. The workers can pull out one end of the conductive ribbon covering the conductive terminal from inside of the clamp structure to protruding outside of the clamp structure; thereby the workers can connect the conductive ribbon and the conductive terminal directly and conveniently.

[0010] Another objective of the present invention is to provide a clamp structure for being able to protrude the conductive ribbon outside of the clamp such that the connecting tool used by the worker can be applied easily. The clamp structure includes the base plate and the pair of jaws. The jaws extend respectively from two transverse sides of the base plate and form the jaw opening opposite to the base plate. The clamp structure has the aperture formed longitudinally in the center of the base plate, and the transverse width the aperture is wider than the jaw opening. The workers can pull out one end of the conductive ribbon from inside of the clamp structure to expose more of it; thereby the connecting tool used by the worker can be applied easily, the connection between the conductive ribbon and the conductive terminal can be more complete. Furthermore, it raises the stability of the connection between the conductive ribbon and the conductive terminal.

[0011] Another objective of the present invention is to provide a clamp structure for the workers to see the conductive ribbon and the conductive terminal clearly while work on the connection thereof. The clamp structure includes the base plate and the pair of jaws. The jaws extend respectively from two transverse sides of the base plate and form the jaw opening opposite to the base plate. The clamp structure has the aperture formed longitudinally in the center of the base plate, and the transverse width the aperture is wider than the jaw opening. The workers can pull out one end of the conductive ribbon from inside of the clamp structure to expose more of it; thereby the workers can see the conductive ribbon and the conductive terminal clearly while work on the connection thereof. It enhances the convenience of the connecting operation, strengthens the stability of the connection between the conductive ribbon and the junction box, and further ensures the power delivering function of the solar cell acting well.

[0012] Another objective of the present invention is to provide a clamp structure for fixing the relative position of the clamp structure and the conductive terminal. The clamp structure includes the base plate and the pair of jaws. The jaws extend respectively from two transverse sides of the base plate and form the jaw opening opposite to the base plate. The clamp structure includes an engaging hole formed on a holding portion of at least one jaw. The engaging hole can be fixed to the corresponding protrusion portion on the conductive terminal for fixing the relative position of the clamp structure and the conductive terminal. Therefore, the stability of the combination between the clamp structure and the conductive ribbon on the conductive terminal will be strengthened.

[0013] Another objective of the present invention is to provide a clamp structure for reducing the necessities of repairing and lengthening the service life of the solar cell. The clamp structure has the aperture formed longitudinally in the center of the base plate, and the transverse width the aperture

is wider than the jaw opening. The workers can see the conductive ribbon and the conductive terminal clearly while work on the connection thereof; thereby it strengthens the stability of the combination between the conductive ribbon and the conductive terminal, reduces the necessary of repairing, lengthens the service life of the solar cell, and further lowers the overall cost while increasing productivity.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0014] FIG. 1 is a schematic perspective view of the clamp structure in accordance with the first preferred embodiment of the present invention.

[0015] FIG. 2 is an exploded view illustrating the combination of the clamp structure and the conductive terminal in accordance with the first preferred embodiment of the present invention.

[0016] FIG. 3 is a schematic perspective view illustrating the combination of the clamp structure and the conductive terminal in accordance with the first preferred embodiment of the present invention.

[0017] FIG. 4 is a cross-sectional view of the clamp structure in accordance with the first preferred embodiment of the present invention.

[0018] FIG. 5 is a cross-sectional view illustrating the combination of the clamp structure and the conductive terminal in accordance with the first preferred embodiment of the present invention.

[0019] FIG. 6 is a top view unfolded drawing of the clamp structure in accordance with the first preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0020] The present invention discloses a clamp structure wherein the clamping method employed is understandable to people of ordinary skill in the art and therefore is not described in detail herein. Also, the drawings referred to in the following description only schematically depict structures related to the technical features of the present invention and hence are not, and need not be, drawn to scale.

[0021] Referring to FIG. 1, a clamp structure 100 is illustrated in accordance with the first preferred embodiment of the present invention. The clamp structure 100 includes a base plate 1 and a pair of jaws 2. The jaws 2 extend respectively from two transverse sides of the base plate 1 and form a jaw opening 21 opposite to the base plate 1. As shown in FIG. 2, the jaw opening 21 allows the conductive terminal 25 and the conductive ribbon 26 being put and clamped in the clamp structure 100 through it. The clamp structure 100 has an aperture 11 formed longitudinally in the center of the base plate, and the transverse width the aperture 11 is wider than the jaw opening 21.

[0022] Referring to FIGS. 2 and 3, the conductive ribbon 26 covers the engaging end 251 of the conductive terminal 25. The workers can connect the conductive terminal and the ribbon conveniently by pulling them out from inside of the clamp structure 100 through the aperture 11. By the way, the workers can see clearly the junction area between the conductive terminal 25 and the conductive ribbon 26 while operating the connection such that the connection can be carried out more smoothly and more efficiently. In this embodiment, the connecting tool is welding torch and the connecting material is solder. However, the connecting tool and material are

not limited by this embodiment; instead, adhesion or any other connecting tool and material which can achieve the same objective can be used in the present invention.

[0023] Referring to FIG. 4, the clamp structure 100 further comprises a concave area 12 formed in the center of the base plate 1, wherein the aperture 11 is formed in the concave area 12. The mechanical structure of the concave area 12 provides higher flexibility and clamping force to the clamp structure 100 such that the convenience and safety during the connecting operation can be ensured.

[0024] At the same time, each of the jaw 2 has an end portion 22 at the jaw opening 21. The pair of end portions (22) extend outwardly to form a V-shape with an included angle θ . The V-shape structure has wider opening which allows the conductive terminal 25 and the conductive ribbon 26 entering the clamp structure more easily. In addition, each jaw has a holding portion 23 near the end portion 22. The holding portion is flat and good for holding the conductive terminal 25 and the conductive ribbon 26 inside the clamp structure 100 stably and firmly.

[0025] Referring to FIG. 4, the clamp structure 100 is illustrated in accordance with the first preferred embodiment of the present invention. The clamp structure 100 includes a pair of engaging holes 24 formed on the holding portion 23 of at least one jaw 2. As shown in FIG. 5, the engaging hole 24 corresponds to a protrusion portion on the conductive terminal for fixing the relative position of the clamp structure 100 and the conductive terminal 25. Therefore, the installation of the clamp structure 100 and the conductive terminal 25 will not be incorrect. In addition, the design further strengthens the combination between the clamp structure 100 and the conductive terminal 25 after the installation. According to another embodiment of the present invention, the clamp structure 100 includes one engaging holes 24 formed on the holding portion 23 of at least one jaw 2.

[0026] FIG. 6 is a top view unfolded drawing of the clamp structure 100 according to the first embodiment of the present invention. It is noticeable that the shape and the number of the engaging hole 24 are not limited by the embodiment. The shape and the number of the engaging hole 24 can be designed and changed variously depending on demand.

[0027] In summary, the clamp structure proposed by the present invention is structurally simple and is effective in clamping the conductive ribbon and the conductive terminal of the junction box securely as well as preventing them from loosening. By contrast, in the connecting operation by using the conventional clamp structure, there is not enough space for the workers to observe the inside of the conventional clamp structure. What's more, the welding or adhering tool can't be inserted easily into the clamp structure to achieve the connection. These difficulties lead to insufficient connection between the conductive ribbon and the conductive terminal, so that the conductive ribbon disconnected from the terminal easily. In the prior art, the inconvenience causes longer time for the workers to achieve the installation and further affects the life length of the solar cell. By using the present invention, the maintain fee and installation cost can be saved, and it's more convenient to assemble the parts. The workers can work on the installation rapidly without wasting time, thereby lowering the overall cost while increasing productivity.

[0028] What described above is only the preferred embodiment of the present invention and is not intended to confine the scope of the present invention. Moreover, as the above description shall be understandable to and can be imple-

mented by people of ordinary skill in the art, any equivalent variations or modifications which do not depart from the spirit of the present invention should be encompassed by the appended claims.

What is claimed is:

1. A clamp structure, comprising a base plate (1), a pair of jaws (2) extending respectively from two traverse sides of the base plate (1) and a jaw opening (21) formed opposite to the base plate (1), the clamp structure being characterized in that: an aperture (11) formed longitudinally in the center of the base plate (1), wherein a transverse width of the aperture is wider than the jaw opening (21).

2. The clamp structure of claim 1, further comprising a concave area (12) formed in the center of the base plate (1), wherein the aperture is formed in the concave area (12).

3. The clamp structure of claim 1, wherein each of the jaw (2) has an end portion (22) at the jaw opening (21), and the pair of end portions (22) extending outwardly to form an included angle θ .

4. The clamp structure of claim 3, wherein each jaw has a flat holding portion (23) near the end portion (22).

5. The clamp structure of claim 4, wherein an engaging hole (24) is formed on at least one holding portion (23).

6. The clamp structure of claim 4, wherein a pair of engaging holes (24) are formed on at least one holding portion (23).

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