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(54) **Elastic recovery device for two articulated arm tools**

(57) The invention relates to an elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, wherein one of the handle arms (2) houses an sliding elastic flat bar (3) having a pressing protuberance (4) and at least a fixing protuberance (5) which might be against a backward window (10) and at least a forward window (8), corresponding to the backward and forward positions matching the deactivated and activated states of the sliding elastic flat bar (3).

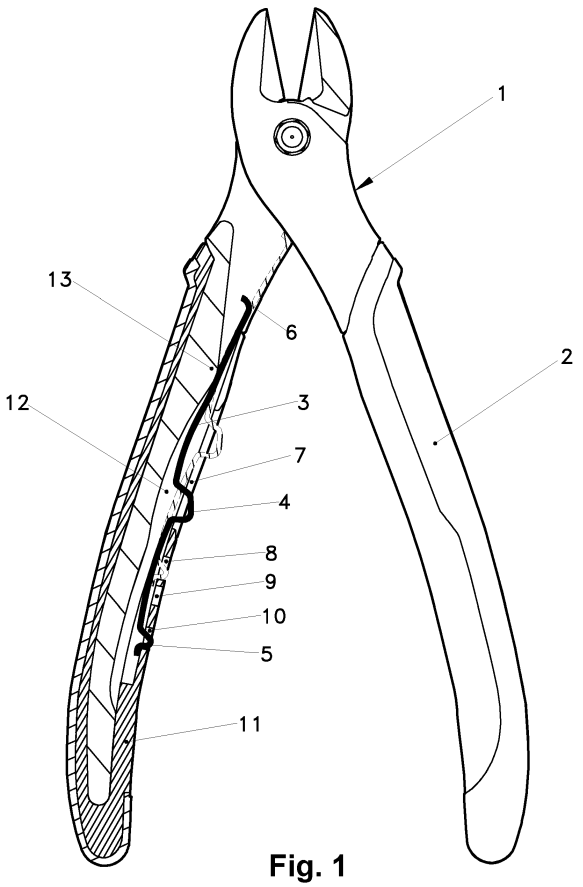

Fig. 1

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Description

[0001] The present invention relates to a sliding elastic flat bar used as an elastic recovery device in the tools comprising two articulated arms, particularly pliers or clamps of any type.

STATE OF THE PRIOR ART

[0002] A wide variety of two articulated arms tools is available in the market and their features depend on the uses they are finally aimed to.

[0003] Within this wide variety of two articulated arms tools we can find standard tools wherein the operator has to do manually the ploy of opening the tool, or with elastic recovery facilitating the return to the initial position every time it is closed. Regarding the two articulated arms tools having recovery or not, there is a little variety in the market offering a fast and solid recovery.

[0004] It is noted that the elastic recovery systems may have different arrangements depending on the system to be used.

[0005] The two articulated arms tool provided with a worm-like spring is very well-known in this field. This arrangement provides a recovery to its initial state once the tool is closed, but prevents the cancellation of this function since the spring is fixed in two cavities corresponding to its diameter in the upper portion of the handle arms. Further, this type of spring has the drawback of getting jammed or stuck easily by the user's fingers or by other tools since they are stored together within a confined space such as a toolbox.

[0006] There is also the two articulated arms tool having a double flat bar recovery being fixed to the upper portion of the handle arms, this system also preventing the deactivation of the elastic recovery. On the other hand, there are two articulated arms tools having a simple revolving flat bar, which cancel or activate the recovery function through a turn thereof. This operation is slow and difficult to proceed in many occasions, and it is an easy breakage point since the flat bar is projecting from a weak support.

EXPLANATION OF THE INVENTION AND ADVANTAGES

[0007] In light of the above mentioned, the present invention proposes an elastic recovery device for two articulated arms tools, particularly pliers and clamps, **characterized in that** one of the handle arms houses an sliding elastic flat bar having a pressing protuberance and at least a fixing protuberance being likely to be against a backward window and at least a forward window, corresponding to the backward and forward positions matching the deactivated and activated states of the sliding flat bar.

[0008] This solution enables the possibility of working using a two articulated arms tool in two different ways; with elastic recovery and without elastic recovery, both working ways being easy and fast to be arranged. A movement, usually using the thumb in the longitudinal direction to one of the handle arms, is usually performed through the pressing protuberance being housed in the pressing window. This movement, which may be upwards or downwards depending on the position the sliding elastic flat bar is meant to be oriented, makes the fixing protuberance be housed in any of the existing windows and, therefore, in two different positions corresponding to the activation and deactivation state enabling the extremely easy and effective use of the tool by the user for two different purposes. The user may wish to use the tool as a fixing method in some cases, the recovery of the tool being inadvisable. In other cases, when the user performs repetitive cutting operations, a fast recovery of the tool is necessary. These two types of tasks are alternated in numerous occasions so the easy activation and deactivation of the elastic recovery is of the outmost importance. According to another special feature of the invention, the pressing protuberance and the fixing protuberance of the elastic flat bar are folds of the arrangement, enabling a simple production since the incorporation of additional pieces for such protuberances is not required.

[0009] According to an optional execution, the housing of the sliding elastic flat bar is foreseen to be performed between the arm cavity and the plastic sleeve, wherein the pressing window, the forward window and the backward window are located. The advantage of this arrangement is that, when the elastic recovery of the tool is not required, the sliding elastic flat bar remains hidden in the arm cavity without causing any type of discomfort in the user's hands, such as snags and small cuts in the fingers. It also renders the undesired manipulation of the activation or deactivation of the recovery difficult. This arrangement also protects the sliding elastic flat bar assuring thereby its durability.

[0010] On the other hand, an intermediate forward window is foreseen to house the fixing protuberance determining an intermediate activated state. The inclusion of an intermediate window enables the user to house the fixing protuberance in such window, the tool having an appropriate opening to be used with materials having smaller thicknesses or cables having smaller diameters. This arrangement enables the user to cut or hold cables or pieces more accurately since the performance force on the handle arms is smaller.

DRAWINGS AND REFERENCES

[0011] The nature of the invention will be better understood with the accompanying drawings depicting a merely illustrative, nonlimiting industrial exemplary embodiment.

Figure 1 depicts a side view of an open two articu-

lated arms tool (1), wherein a portion of one of the handle arms is seen (2). This figure 1 includes a movement of the sliding elastic flat bar (3) to the activated position being depicted by the imaginary line.
Figure 2 shows a side view of a two articulated arms tool (1), wherein the sliding elastic flat bar (3) is located in the activated position and it is flexed in its elastic recovery by closing the handle arms (2).
Figure 3 depicts a side view of a two articulated arms tool (1) illustrating the forward position of the sliding elastic flat bar (3) and the sliding withdrawal movement thereof until the deactivated position being depicted by the imaginary line.
Figure 4 is a perspective view of the sliding elastic flat bar (3).
Figure 5 shows a side view of a two articulated arms tool (1), wherein the sliding elastic flat bar (3) is in the intermediate activated position and it is flexed in its elastic recovery by closing the handle arms (2).

[0012] The following references are indicated in these figures:

1.- Two articulated arms tool.
2.- Handle arm.
3.- Sliding elastic flat bar.
4.- Pressing protuberance.
5.- Fixing protuberance.
6.- Performance head.
7.- Pressing window.
8.- Forward window.
9.- Intermediate window.
10.- Backward window.
11.- Plastic sleeve.
12.- Arm cavity.
13.- Supporting hill.

DISCLOSURE OF A PREFERRED EMBODIMENT

[0013] According to the above drawings and references, a preferred way of execution of the object of the present invention is illustrated in the attached drawings, referred to an elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, which, as it is shown in figure 1 an sliding elastic flat bar (3) is housed in one of the handle arms (2) having a pressing protuberance (2) and a fixing protuberance (5) likely to be against a forward window (8) or a backward window (10), corresponding to forward and backward positions, respectively, matching the activated and deactivated state of the sliding elastic flat bar (3). This arrangement enables the operator to work using a single tool (1) in two different ways; with elastic recovery and without elastic recovery, resulting in an easy, fast and solid use in both positions. A movement by means of the thumb in a longitudinal direction to one of the handle arms (2) is performed through a pressing protuberance (4) as a push button, located in the pressing window (7). Depending on the position the sliding elastic flat bar (3) is meant to be moved, the movement will be upwards or downwards implying that the fixing protuberance (5) is housed in the forward window (8) or in the backward window (10).

[0014] As it is seen in figure 4 the pressing protuberance (4) and the fixing protuberance (5) of the sliding elastic flat bar (3) are folds of the arrangement. Such folds shaping the sliding elastic flat bar (3) are obtained through a stamping process being fast and low cost of manufacturing. Another important feature is the material and thickness given to the sliding elastic flat bar (3) conferring the optimum durability and resistance features.

[0015] Another special feature of the invention seen in the figure 1 and figure 3 is the fact that the housing of the sliding elastic flat bar (3) is carried out between an arm cavity (12) and the plastic sleeve (11), wherein the pressing window (7), the forward window (8) and the backward window (10) are located. In specific moments or where the elastic recovery is not required in certain tasks, the sliding elastic flat bar (3) remains within the arm cavity (12) without causing any discomfort to the user, such as snags in clothes or even small cuts in fingers.

[0016] As it is seen in figure 2, a supporting hill (13) of the sliding elastic flat bar (3) is located on the upper portion of the arm cavity (12). This geometry of the arm cavity (12) makes the sliding elastic flat bar (3) play the required recovery flexure for the elastic recovery, since by colliding of the upper portion of the handle arm (2) with the performance head (6) of the sliding elastic flat bar (3), the latter is deformed performing an spring effect against the supporting hill (13) and it is elastically recovered by opening the tool in the moment the sliding elastic flat bar (3) stops exerting force.

[0017] Regarding the figure 5, it is foreseen an intermediate window (9) being likely to house the fixing protuberance (5) determining an intermediate deactivated state. This arrangement causes the collision of the performance head (6) of the sliding elastic flat bar (3) with a preceding point of the upper portion of the handle arm (2), which causes the distance between the handle arms (2) to be smaller and enables the user to exert less force since the path to the overall closure of the tool is smaller. This position is of outmost importance when the user wishes to perform repetitive cutting operations in materials having smaller thicknesses or cables having smaller diameters requiring a fast recovery of the tool.

Claims

1. Elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, **characterized in that** one of the handle arms (2) houses an sliding elastic flat bar (3) having a pressing protuberance (4) and at least a fixing protuberance (5) which might be against a backward window (10) and at least a forward window (8), corresponding to the backward

and forward positions matching the deactivated and activated states of the sliding elastic flat bar (3).

2. Elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, according to claim 1, **characterized in that** the pressing protuberance (4) and the fixing protuberance (5) of the sliding elastic flat bar (3) are folds of the arrangement.

3. Elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, according to claim 1, **characterized in that** the housing of the sliding elastic flat bar (3) is preferably performed between an arm cavity (12) and the plastic sleeve (11) wherein a pressing window (7), the forward window (8), an intermediate window (9) and the backward window (10) are located.

4. Elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, according to claim 1, **characterized in that** a supporting hill (13) of the sliding elastic flat bar (3) is preferably located on the upper portion of the arm cavity (12).

5. Elastic recovery device for two articulated arms tools (1), particularly pliers or clamps, according to claim 1, **characterized in that** an intermediate window (9) is foreseen to house the fixing protuberance (5) determining an intermediate activated state.

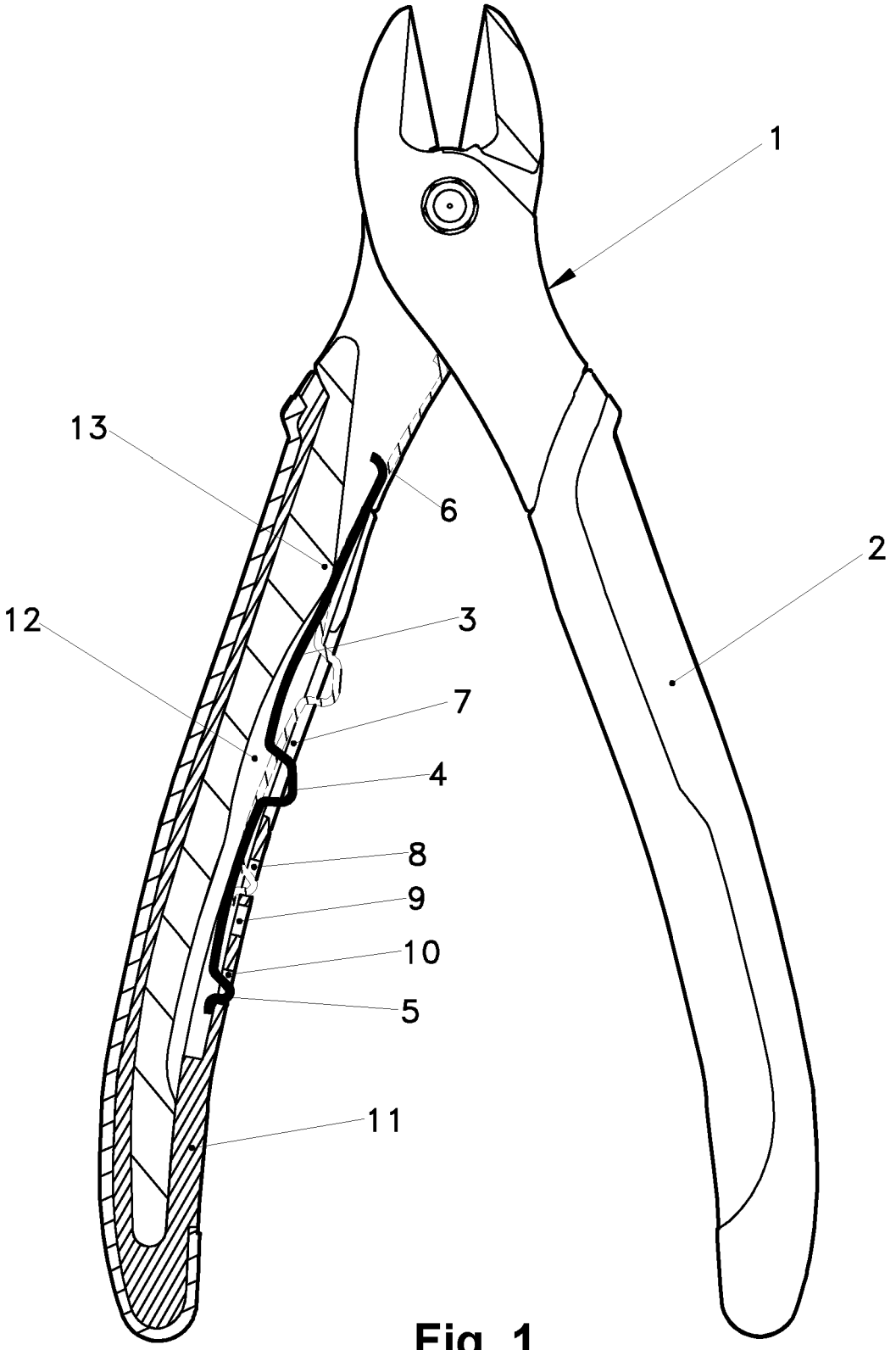

Fig. 1

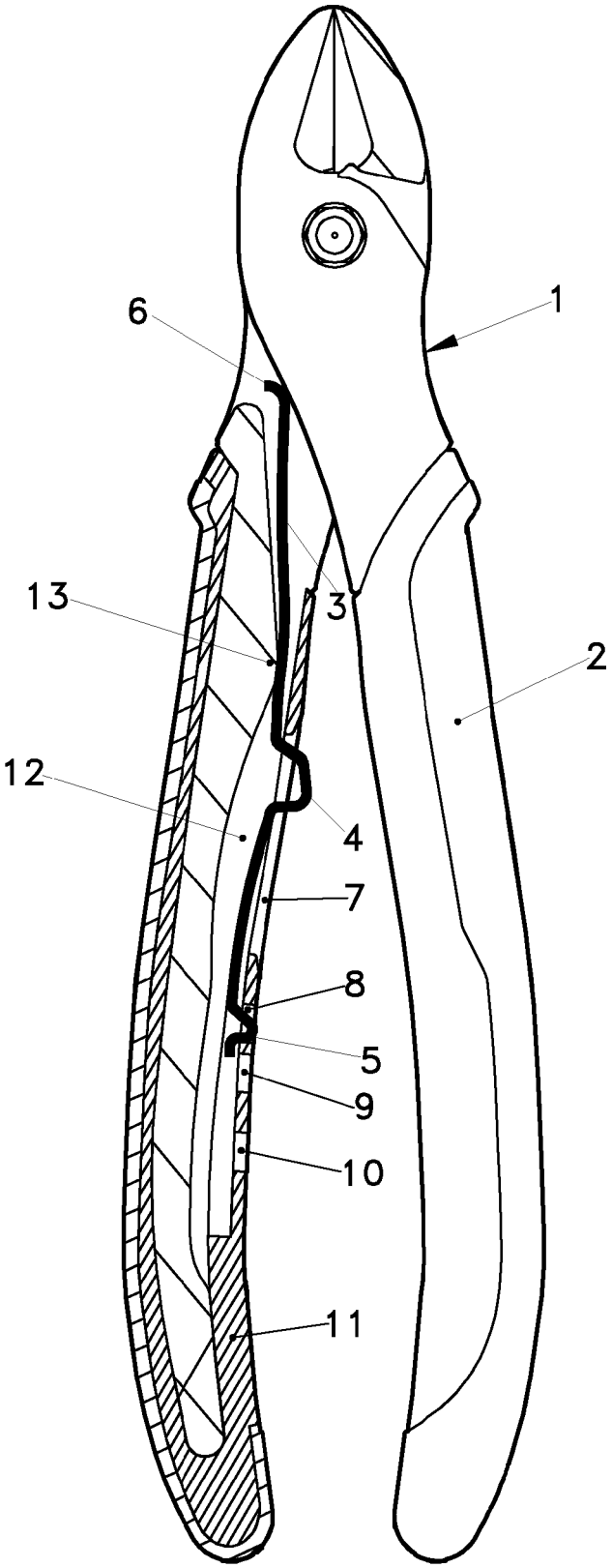

Fig. 2

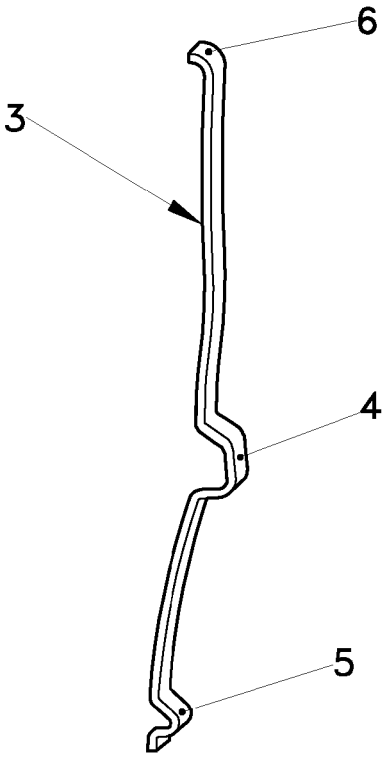

Fig. 4

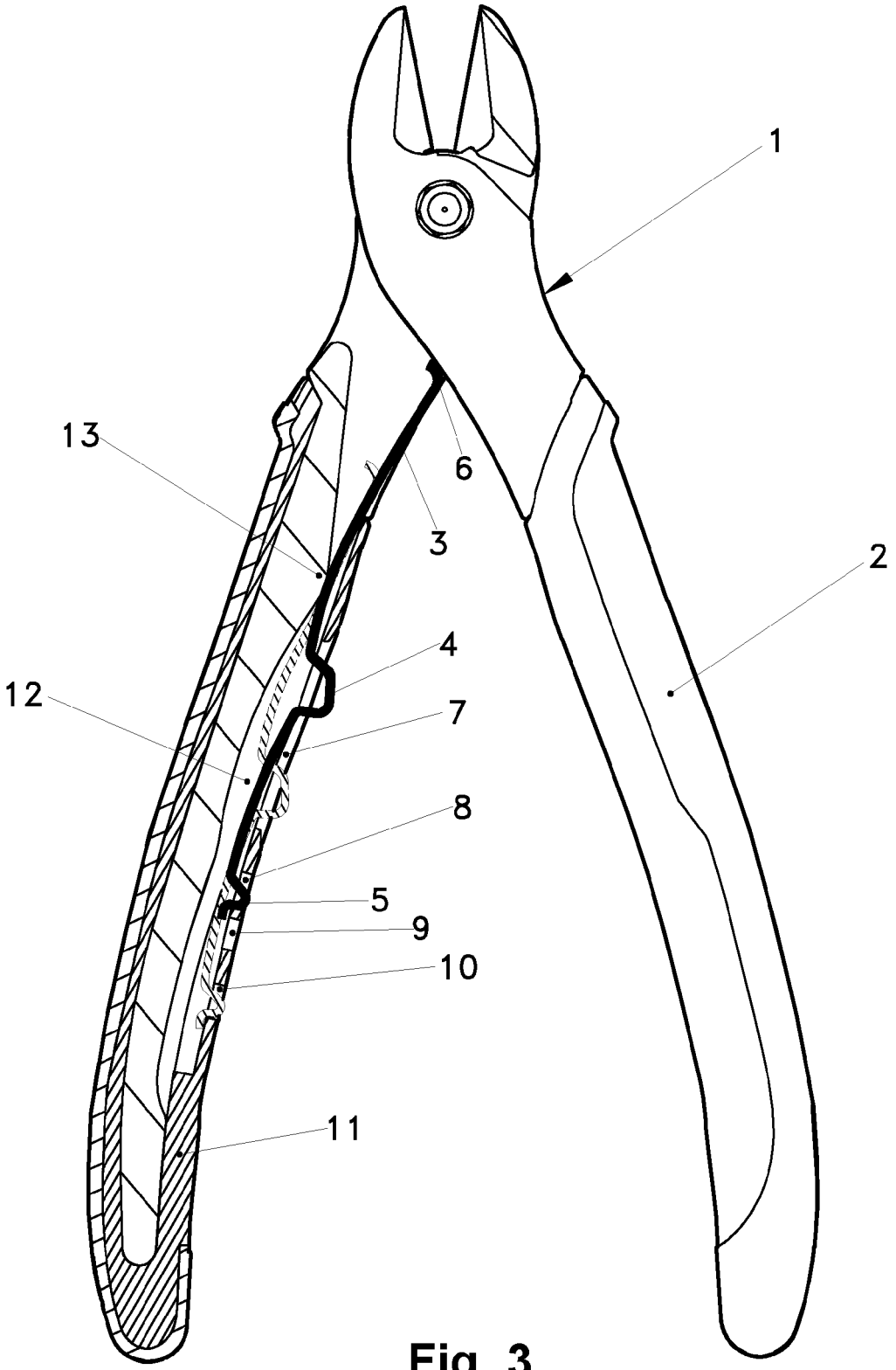

Fig. 3

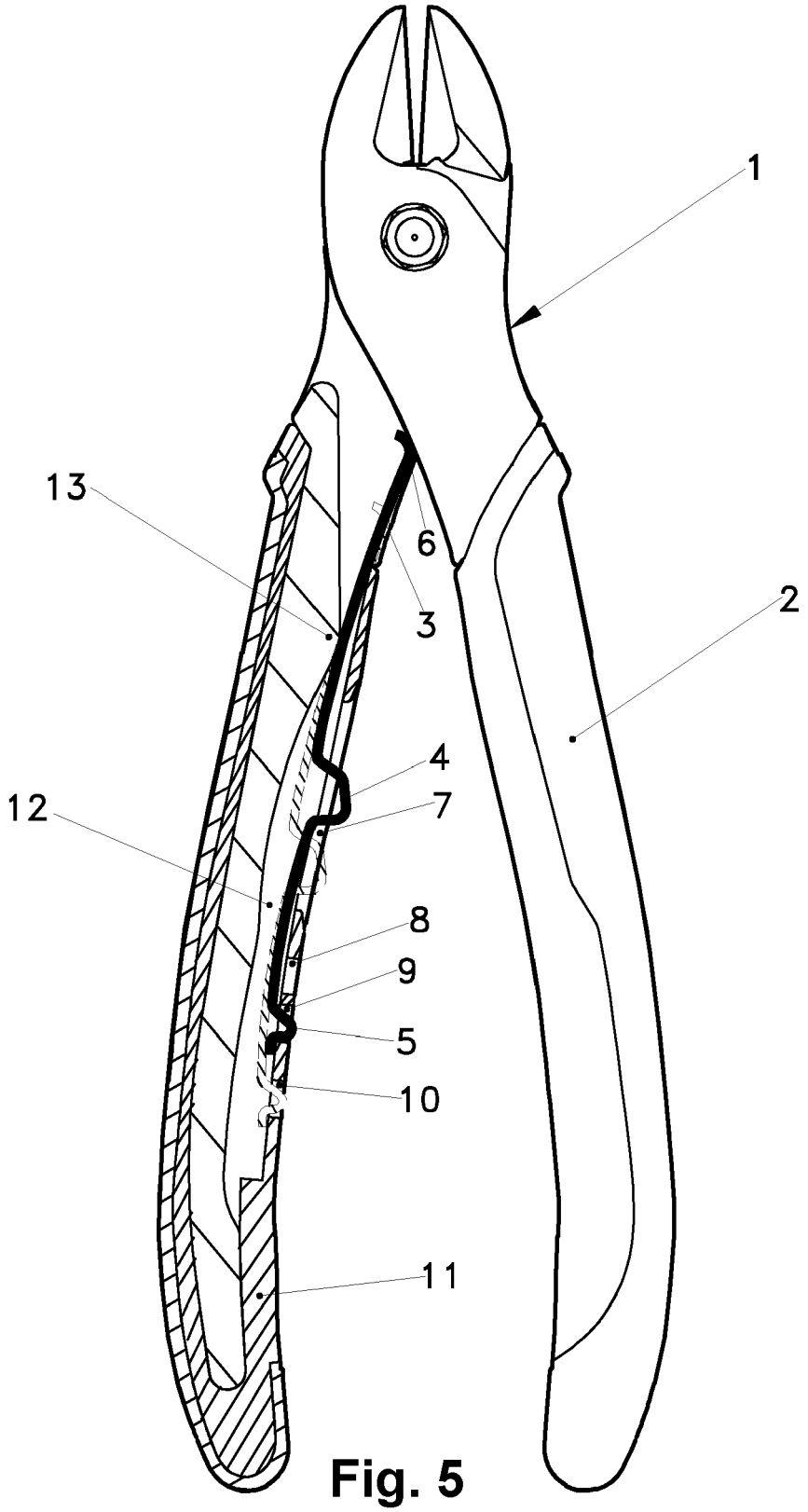

Fig. 5