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(54) Locking device for tools of the type with two pivoted handles, such as pliers, pincers and the like.

(57) A locking device for tools of the type with two pivoted handles, such as pincers, pliers and the like, comprising at least one element (5) that is detachably associated with the handles (3, 4) of the tool (2) and forms at least one first pair of openings (6a, 6b) for selective insertion of the handles (3, 4), which are substantially proximate to each other so as to keep the handles (3, 4) stably in a closed configuration of the tool (2), and at least one second pair of openings (7a, 7b) for selective insertion of the handles (3, 4), which are substantially mutually spaced so as to keep the handles (3, 4) stably in an open configuration of the tool (2).

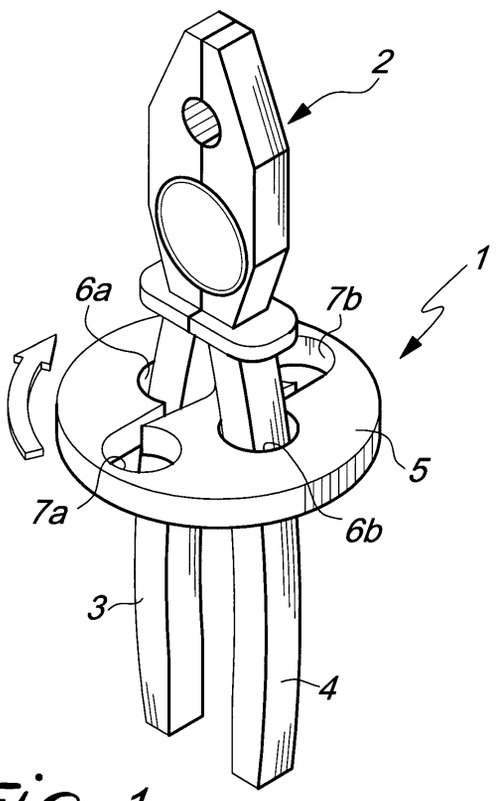

Fig. 1

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Description

[0001] The present invention relates to a locking device for tools of the type with two pivoted handles, such as pincers, pliers and the like.

[0002] Tools of the type with two pivoted handles are widely used in the most disparate industrial, handicraft, professional fields or hobbies and DIY.

[0003] In each one of these fields, the need is undoubtedly felt to have tools that are advantageously capable of automatically fastening their handles when they are not being used, for example for reasons of safety or convenience in use. In order to meet this requirement, tools have been devised which have elastic closure means between their handles; such elastic means are generally constituted by metallic springs, for example of the helical or spiral type, which first of all cause a significant increase in the production cost of the item and secondly often constitute a bulk and a hindrance to the correct use of the tool.

[0004] Moreover, the need is also felt in every sector to be able to keep the handles not only stably closed but also stably divaricated in an open position: consider, for example, all the situations in which the operator has one hand occupied and must be able to grip the tool and use it promptly with the other hand. Clearly, this operation becomes extremely faster and easier if the tool already has its handles divaricated.

[0005] The aim of the present invention is to obviate the cited drawbacks and meet the mentioned requirements, by providing a locking device for tools of the type with two pivoted handles that allows to keep the handles stably both in a closed position and in an open position, at the user's discretion.

[0006] Within this aim, an object of the present invention is to provide a detachable device that is easy and versatile to apply to any type of tool.

[0007] Another object of the present invention is to provide a locking device that is simple, relatively easy to provide in practice, safe in use, effective in operation, and has a relatively low cost.

[0008] This aim and these and other objects that will become better apparent hereinafter are achieved by the present locking device for tools of the type with two pivoted handles, such as pincers, pliers and the like, characterized in that it comprises at least one element that is detachably associated with the handles of the tool and forms at least one first pair of openings for selective insertion of the handles, which are substantially proximate to each other so as to keep the handles stably in a closed configuration of the tool, and at least one second pair of openings for selective insertion of the handles, which are substantially mutually spaced so as to keep the handles stably in an open configuration of the tool.

[0009] Further characteristics and advantages of the present invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a locking device for tools of the type with two pivoted handles, such as pincers, pliers and the like, according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a tool associated with the locking device according to the invention, in the closed configuration;
Figure 2 is a perspective view of a tool associated with the locking device according to the invention, in the open configuration;
Figure 3 is a plan view of the device according to the invention;
Figure 4 is a plan view of a second embodiment of the device according to the invention;
Figure 5 is a plan view of a third embodiment of the device according to the invention;
Figure 6 is a plan view of a fourth embodiment of the device according to the invention.

[0010] In the embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0011] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0012] With reference to the figures, the reference numeral 1 generally designates a locking device for tools of the type with two pivoted handles, such as pincers, pliers and the like, according to the invention.

[0013] In the figure, the device is applied, by way of example, to a pair of pliers 2 provided with handles 3 and 4, but can actually be applied to any kind of tool with two pivoted handles, of any size and intended for any field of application.

[0014] The device according to the invention comprises at least one element 5, which is for example substantially oval and is detachably associated with the handles 3 and 4 of the tool 2 and forms at least one pair of openings 6a and 6b for selective insertion of the handles 3 and 4, which are substantially proximate to each other, so as to keep the handles 3 and 4 stably in a configuration in which the tool 2 is closed; the element 5 also forms at least one second pair of openings 7a and 7b for selective insertion of the handles 3 and 4, which are substantially mutually spaced, so as to keep said handles stably in an open configuration of the tool 2, as shown in Figure 2, all at the user's discretion in relation to the operating requirements.

[0015] Conveniently, as shown in Figure 3, the openings of the first pair 6a and 6b and of the second pair 7a and 7b are arranged, on the element 5, substantially mutually opposite at the corners of a quadrilateral whose diagonals have mutually different lengths (the length of the shorter diagonal is the mutual distance of the openings of the first pair 6a and 6b and the length of the long-

er diagonal is the mutual distance of the openings of the second pair 7a and 7b).

[0016] The element 5 is conveniently made of substantially elastic material for example a rubber-like material. With this solution, it is possible to keep the handles 3 and 4 in the chosen open or closed position. In particular, the elastic return of the element 5 returns the handles 3 and 4 to the chosen configuration after the operator has released his grip on them.

[0017] Conveniently, each one of the openings of the first pair 6a and 6b is connected to a respective opening of the second pair 7a and 7b, so that with a simple and rapid manual rotation of the element 5 it is possible to transfer the handles 3, 4 from the openings of the first pair 6a and 6b, with the tool in the closed configuration, to the openings of the second pair 7a and 7b, with the tool in the open configuration, and vice versa. In particular, the openings of the first pair 6a and 6b are connected to the openings of the second pair 7a and 7b by means of slits 8a and 8b that can divaricate elastically and widen when the handles 3 and 4 pass.

[0018] The element 5 is conveniently provided with perimetric knurlings 9, so as to facilitate first of all the manual rotation of said element in order to make the handles 3, 4 pass from the first pair of openings 6a and 6b to the second pair of openings 7a and 7b and vice versa, and also the insertion and extraction of the handles 3, 4 from said openings.

[0019] The method of use of the invention is intuitive. First the handles 3 and 4 are inserted either in the first pair of openings 6a and 6b or in the second pair of openings 7a and 7b, depending on the primary requirement of the user (stably open tool or stably closed tool). In practical use, assuming that the tool 2 is in the closed configuration, the user opens in each instance the handles 3 and 4 to perform the operations; when said handles are released, they return to the closed configuration due to the elastic return of the element 5. A similar and opposite situation occurs if the tool 2 is kept stably in the position in which the handles 3 and 4 are open and the user has to close them in each instance to perform the operations.

[0020] It has thus been shown that the invention achieves the intended aim and objects. The device can be applied to any tool 2 rapidly and easily.

[0021] If required, a plurality of elements 5 can also be used on a same tool 2.

[0022] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0023] A second embodiment of the device according to the invention is shown in Figure 4. The element 5 in this embodiment is narrower and slenderer and is not provided with the slits 8a and 8b, and therefore has to be removed and inserted each time along the handles 3 and 4 in order to achieve the intended stable configuration.

[0024] Figure 5 is a view of a third embodiment of the device according to the invention. Advantageously, each one of the openings 7a and 7b of the second pair (or also each one of the openings 6a and 6b of the first pair) is delimited by two half-borders 10a and 10b, which are separated by a notch 11 so that they can be divaricated elastically in order to facilitate the insertion and extraction of the handles 3 and 4 of the tool 2.

[0025] A fourth embodiment of the device according to the invention is shown in Figure 6: the openings of the first pair 6a and 6b (or also of the second pair 7a and 7b) are substantially mutually connected, so as to facilitate in particular the insertion and extraction of the handles 3 and 4 by reducing friction.

[0026] All the details may be replaced with other technically equivalent ones.

[0027] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0028] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A locking device for tools of the type with two pivoted handles, such as pincers, pliers and the like, **characterized in that** it comprises at least one element (5) that is detachably associated with the handles (3, 4) of the tool (2) and forms at least one first pair of openings (6a, 6b) for selective insertion of the handles (3, 4), which are substantially proximate to each other so as to keep the handles (3, 4) stably in a closed configuration of the tool (2), and at least one second pair of openings (7a, 7b) for selective insertion of the handles (3, 4), which are substantially mutually spaced so as to keep the handles (3, 4) stably in an open configuration of the tool (2).

2. The device according to claim 1, **characterized in that** the openings of said first pair (6a and 6b) and of said second pair (7a and 7b) are arranged, on said element (5), so that they are substantially mutually opposite along the corners of a quadrilateral.

3. The device according to claims 1 and 2, **characterized in that** said element (5) is made of substantially elastic material, so as to keep the handles (3, 4) in the intended configuration.

4. The device according to one or more of the preceding claims, **characterized in that** each one of the openings of said first pair (6a, 6b) is connected to

a respective opening of said second pair (7a, 7b), so that by means of a manual rotation of the element (5) it is possible to transfer the handles (3, 4) from the openings of said first pair (6a, 6b), with the tool (2) in the closed configuration, to the openings of said second pair (7a, 7b), with the tool (2) in the open configuration, and vice versa.

5. The device according to one or more of the preceding claims, **characterized in that** the openings of said first pair (6a, 6b) are connected to the openings of said second pair (7a, 7b) by means of slits (8a, 8b) that can divaricate elastically.

6. The device according to one or more of the preceding claims, **characterized in that** each one of the openings of said first pair (6a, 6b) is delimited by two half-borders (10a, 10b), which are separated by a notch (11), so that they can be divaricated elastically in order to facilitate the insertion and extraction of the handles (3, 4) of the tool (2).

7. The device according to one or more of the preceding claims, **characterized in that** each one of the openings of said second pair (7a, 7b) is delimited by two half-borders (10a, 10b), which are separated by a notch (11), so that they can be divaricated elastically in order to facilitate the insertion and extraction of the handles (3, 4) of the tool (2).

8. The device according to one or more of the preceding claims, **characterized in that** the openings of said first pair (6a, 6b) are mutually substantially connected.

9. The device according to one or more of the preceding claims, **characterized in that** the openings of said second pair (7a and 7b) are mutually substantially connected.

10. The device according to one or more of the preceding claims, **characterized in that** said element (5) is provided with perimetric knurlings (9) that are suitable to facilitate the insertion and extraction of the handles (3, 4) with respect to the openings (6a, 6b; 7a, 7b) and rotation.

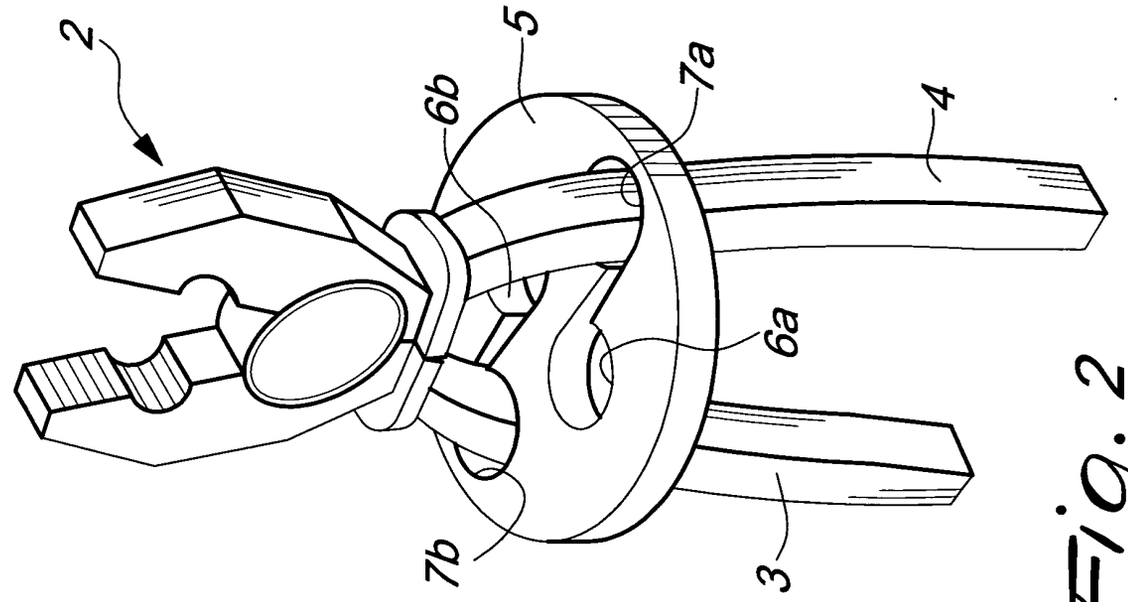

Fig. 2

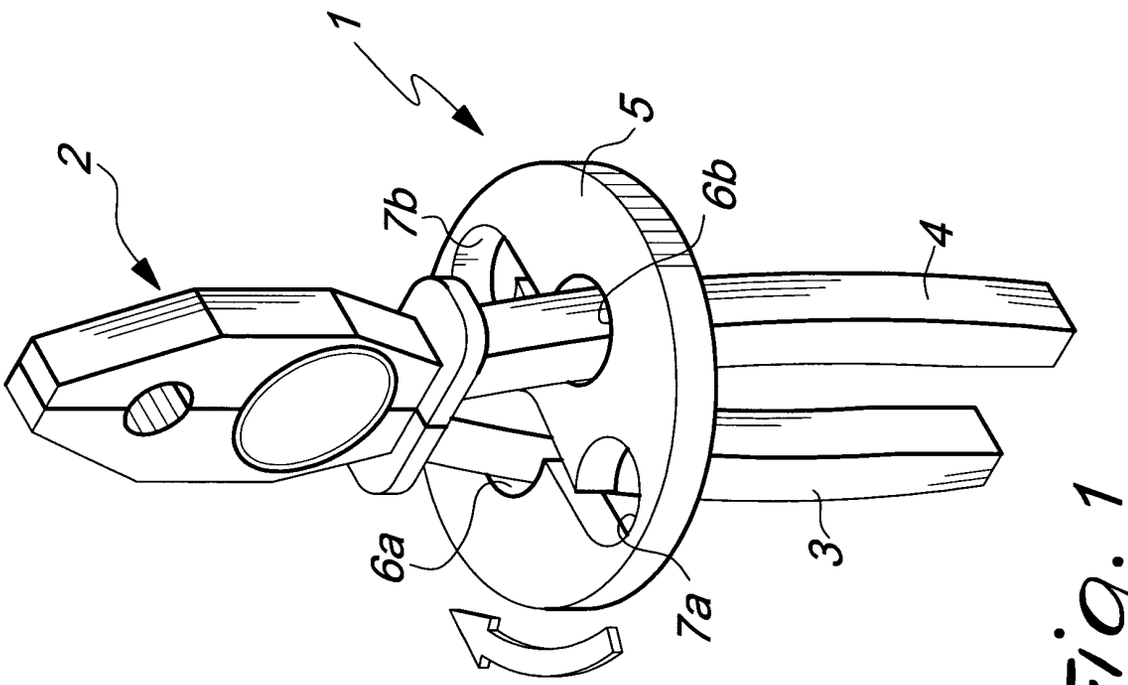

Fig. 1

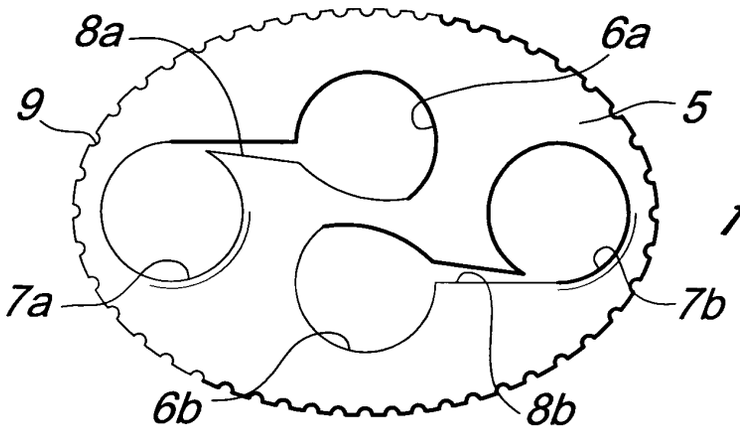

Fig. 3

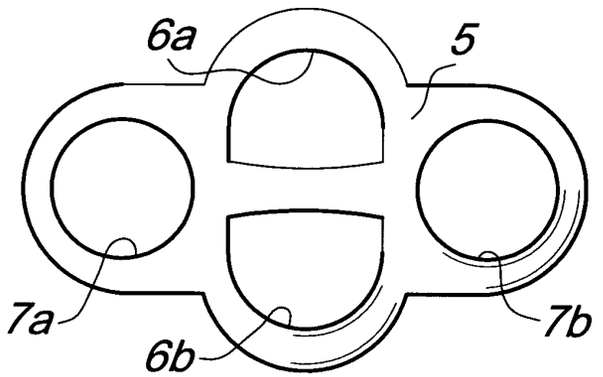

Fig. 4

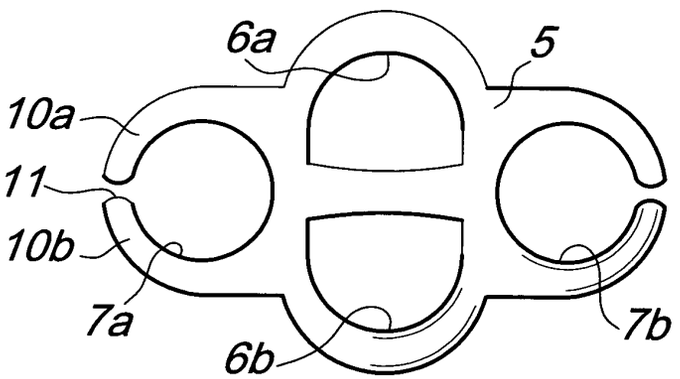

Fig. 5

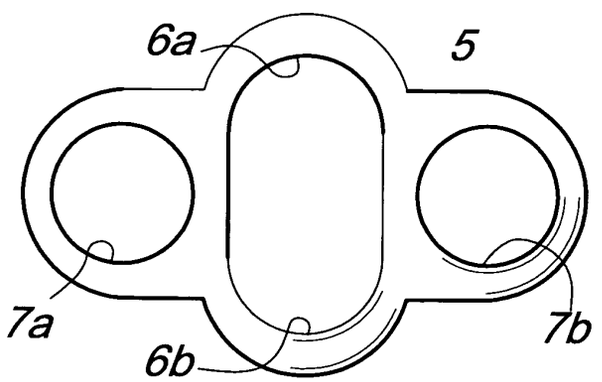

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5439

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 November 2004	Rilliard, A

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