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## (54) Converter device for staple-stitching pliers for fixed or retractable operation of the staple slide.

(57) A converter device for staple-stitching pliers for fixed or retractable operation of the staple slide, applicable to staple-stitching pliers of the type covered by European Patent application 86.500 002.0, so that the said pliers can have the slide-holder part and the staple slide either in the fixed position or in the rotatable position. To do this, there is a shaft (23) housed in a bushing or sleeve (24) and this in turn is inside an external control (13). The shaft (23) is controlled by a spring (22) in a head (21). The end of the shaft (23) juts out or remains hidden in the interior.

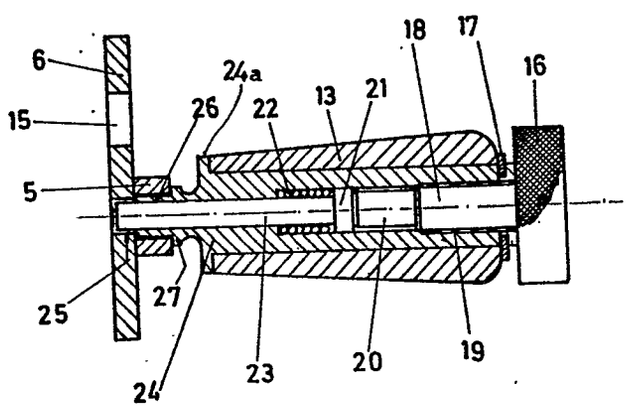


FIG: 4

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This invention related to stapling pliers of the type described in the application for European Patent Nº 86 500 002.0, being of the type that are made up of two arms by way of pliers or pincers, which pick up a first staple from a staple loader, normally arranged in a perpendicular position to the plane of the pliers. The ends of arms are situated towards an opening in a support part, on which the said arms pivot by means of drag links and onto which the staple loader slide has access at a said height.

Each staple is presented in the opening and makes contact with the stop-part, so that when the arms are operated, their upper claws pick up the staple and apply it to the area that it is wished to fasten.

In this kind of pliers, the slide-holder part turns determining two extreme positions, according to which, once a staple has been placed, the slide that is included with the staple loader is moved back to provide sufficient space to position the staple quite normally on the point where it has to be applied.

The combination of a control connected to a spring and to the slide-holder part allows these movements to be carried out, according to which the tool always moves back or retracts, automatically, the loader when a staple is going to be applied.

In the previously mentioned European Patent application Nº 86 500 002.0, a very complex mechanism was included to convert the tool into one which either kept the slide-holder part fixed, or else allowed the said slide-holder part to turn.

A basic aim of the invention is to obtain a set of pliers of the type described, which, according to needs, can be used so that the slide-holder part turns, moving back from the point of application of the staple, in one position of the tool, or can remain fixed in the initial position, with a completely simple device, at low cost and easy to use.

To carry out this aim, which makes the pliers a dual-purpose fixed or retractable tool, the invention uses the same basic technique as that used in European Patent application Nº 86 500 002.0, with a hole being made in the support part of the pliers lines up with that of the slide-holder part and also lined up with the longitudinal shaft of the operating control of the slide-holder part.

This longitudinal shaft of the control can be moved in the direction of its axis, with a controlled and controllable movement, so that a front end of the said shaft, on the side near the tool, can penetrate or not into the hole cut in the support-part, which is fixed. If this end of the shaft is housed in the said hole in the support-part, the slide-holder part cannot turn, with which the staple loader remains in the same position. If the said shaft end is taken out of the hole in the support-part, the tool operates so that the staple loader connected to the slide-holder part moves back caused by the turning of the slide-holder.

To do this, an operating control body is provided, which is axially holed and receives a bushing in its interior. The bushing is in turn holed and includes, partially, a shaft towards the end on the side near the tool and the stem of a bolt towards the opposite side.

The bushing has a cylindrical projection which is housed in the hole in the slide-holder part, with a first circular flange nearby that makes frontal contact with the said part and a second circular flange which the external control body butts up against. At the opposite end, the bushing has a slot that receives a pressure washer, so that the control body is controlled between the second flange of the bushing and the washer.

The shaft, which partially occupies the axial hole in the bushing, is provided with a rear circular projection that faces up to an internal projection of the axial hollow in the said bushing, with a recovery spring being situated between both.

Forward of the circular projection in the axial hollow in the bushing, this axial hole is perfectly cylindrical and the shaft slides in it.

The rear circular projection of the shaft is in contact at the opposite side with the stem of the bolt. This stem is screwed to the inside of the bushing and can be inserted to a greater or lesser degree by operating on the outer head of the bolt. Greater or lesser penetration of the bolt stem will determine whether the spring that acts against the head of the shaft is given more or less travel.

In an extreme position, the bolt stem will allow the spring to act against the head of the shaft and the free end of the shaft to be out of its contact in the hole in the support-part. With this, the pliers can be used so that the slide-holder part turns and the staple loader moves back from its position for stapling to be carried out.

In the other extreme position of the bolt, the stem will make contact with the head of the shaft, thus compressing the spring with greater pressure, so that the free end of the shaft is housed to the limit in the hole in the support-part. With this, the pliers can be used in the conventional way, with the staple slide irremovable.

All these and other details of the invention will be appreciated in greater detail in the non-restrictive practical solution shown in the accompanying sheets of drawings:

- Figure 1 shown an elevation of the pliers with the rotatable slide-holder part, to which the object of the invention can be applied.
- Figure 2 is a view of Figure 1 as seen from its left side.

- Figure 3 is a detail of the invention, in which the support-part and slide-holder part can be appreciated.

- Figure 4 is a cross-sectional view on line I-I of Figure 3.

In accordance with Figures 1 and 2, we can appreciate a set of pliers by means of two arms 1 and 2, between which there is a recovery spring 3, as well as drag links fastened at A and B to each arm 1 and 2. The ends of the drag links are taken up in the groove 15 in the support part 6. The stop part 4 for the first staple in the batch of staples can also be seen in Figure 1. In this Figure, the slide-holder part 5 is lowered with the control 13 raised and with its opening area making contact with the rivet B of the arm 2.

The loader 7 receives the staples in its inside and presents them towards the stop-part 4 in combination with the spring 9, the bar 8 and the stop 10. The arm 1, the slide-holder parts 5, the support-part 6 and the stop-part 4 are easily identified, in their conjunction with the bolt 14, which juts out at 11 and fastens the said parts. The control 13 is fastened to the slide-holder part 5 and in collaboration with the spring 12, is taken in between the said control 13 and the projection 11.

In accordance with the particular points of the invention, and with reference to Figure 3, we can see the support-part 6, which is fixed, as well as the slide-holder part 5, which turns as shown by the angle ($\alpha$) to the position marked by the dotted lines 5a, together with the control position 13, which moves to position 13a.

In this Figure we can appreciate the interconnection between the lower end, not numbered, of the part 5 and the whole control assembly, a connection which is perfectly defined in Figure 4, which shows the view according to the cross-section I-I as shown in Figure 3.

Here, we can appreciate the support 6 with the groove 15 in which the ends of the drag links A and B move, as well as the hole 25 that characterizes the invention cut into the part 6 and aligned with the hole 26 that is included in the part 5 so that the control 13 can be inserted.

In this position, in which the part 5 is vertical (Fig. 3), the holes 25 and 26 are aligned with each other and with the theoretical axis of the control 13. This axis 23 partly occupies the interior of the axial hole in the bushing 24 housed in the control 13.

The bushing 24 is housed in the hole in the part 5 by its forward projection 26, which is near the first flange that butts up against the front of the said part 5. The body of the control 13 is crossed through by the bushing and controlled longitudinally over it by the circular edge 24a and the pressure washer 17.

The shaft 33 has a head 21 against which rests a spring 22, which is in turn controlled inside the bushing by a projection which is not numbered. The stem of the bolt 16 has a forward section 20 which makes contact with the head 20 of the shaft 23 and a rear section 18 screwed to the inside 19 of the bushing. Greater or lesser penetration of the threaded section 18 of the stem makes the head 21 of the shaft 23 move more towards the left or towards the right, according to Fig. 3, so that when in the limit or extreme positions, the end of the shaft 23 either penetrated or not into the hole 25 in the part 6, thus causing the tool to work in the normal position or in the position with the slide-holder part 5 rotatable.

## Claims

1 - "CONVERTER DEVIDE FOR STAPLE-STITCHING PLIERS FOR FIXED OR RETRACTABLE OPERATION OF THE STAPLE SLIDE", applicable to pliers fitted with a fixed support-part and another staple slide-holder part connected to a externally operated control, which retracts, by turning, so that the staple can be easily positioned, with a through hole in the support-part, which is aligned, in the normal position of the staple slide, with that of the slide-holder part on which the operating control 13 is situated, which is essentially characterized because the said control 13 has an axially holed central body 24 with a forward section 26 which is housed in the hole in the slide-holder part with a circular stop projection at the edge of the said hole, including in its axial interior a shaft 23 capable of being inserted into the hole in the support-part in order to immobilize or block the said support-part and slide-holder part, having means to regulate the protrusion of the shaft from the bore or centre of the central body of the control and means to fasten the said central body to an outer covering casing of the control.

2 - "CONVERTER DEVIDE FOR STAPLE-STITCHING PLIERS FOR FIXED OR RETRACTABLE OPERATION OF THE STAPLE SLIDE", in accordance with Claim 1, characterized because the means to regulate the protrusion of the shaft from the bore are made up of an internal recess in the bore or centre of the central body, which receives a spring 22 resting on the said recess and on a shaft end annular projection 21 and an externally operated bolt 16, which is provided with a stem with a threaded section 18 and an end capable of butting up against the annular projection of the shaft, in which the said threaded section is connected to an inner end section of the bore in the central body.

3 - "CONVERTER DEVICE FOR STAPLE-STITCHING PLIERS FOR FIXED OR RETRACTA-

BLE OPERATION OF THE STAPLE SLIDE", in accordance with Claim 1, characterized because the means for fastening the outer casing 13 are made up of an outer annular projection 24a of the central body, on the side near the slide-holder part, on which the said outer casing rests, as well as a precision washer 17, at the other end, mounted over the central body on which the outer casing is supported.

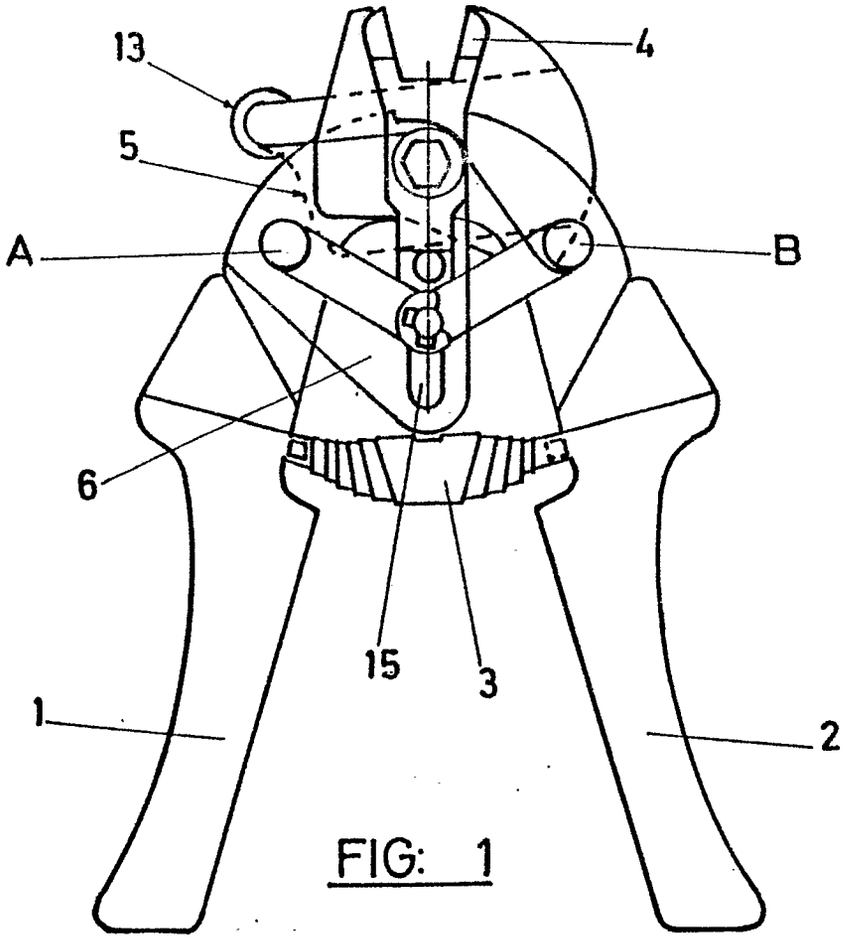


FIG: 1

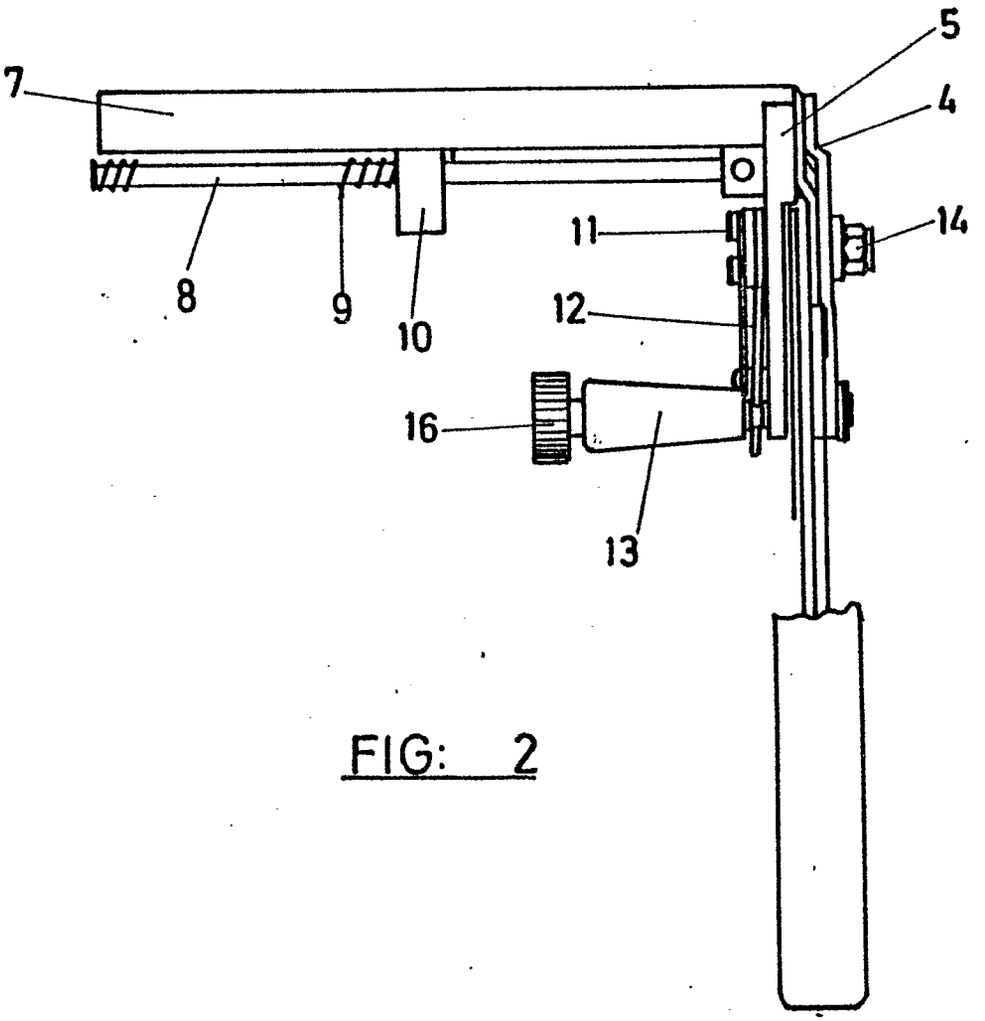


FIG: 2

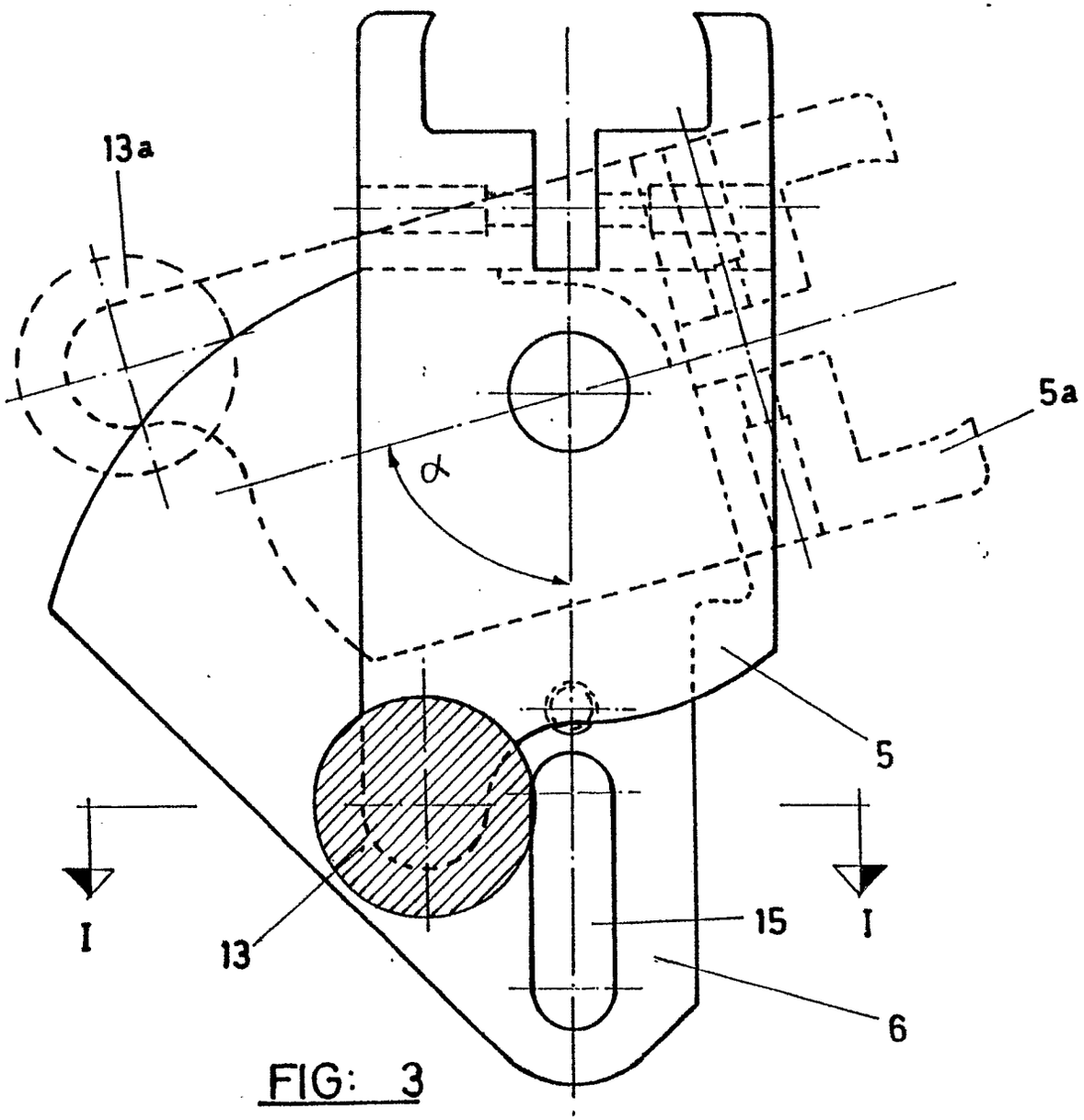


FIG: 3

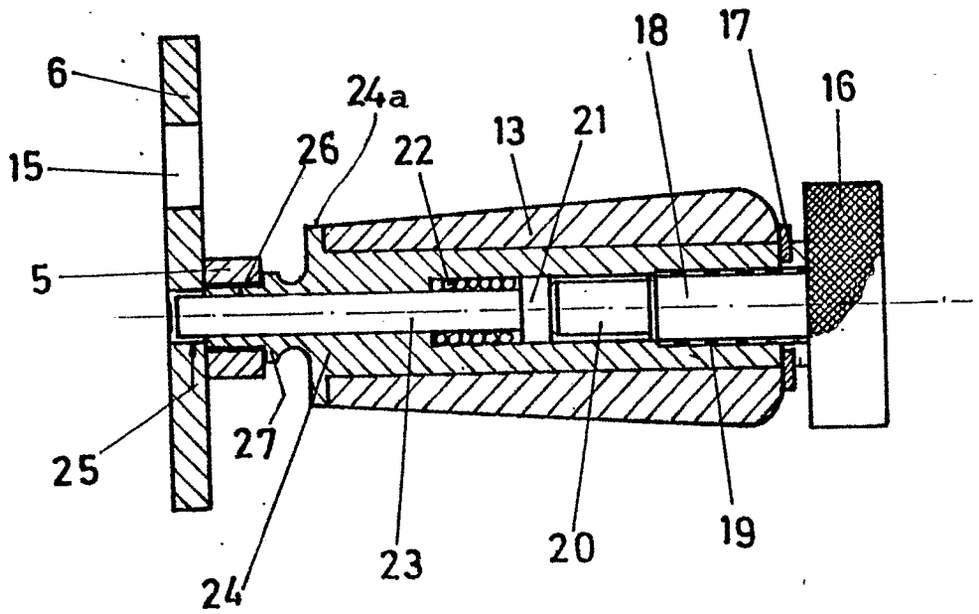


FIG: 4

European Patent Office

# EUROPEAN SEARCH REPORT

Application number

EP 89500112.1

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
|---|---|---|---|
| D,A | EP - A1 - 0 226 525<br>(SIMENS SENCO, S.A.)<br>* Claims 2,3; fig. 9,10 *<br>-- | 1 | B 25 B 25/00<br>B 25 B 7/16 |
| A | US - A - 2 854 876<br>(GREEN)<br>* Claim; fig. "<br>-- | 2 | |
| A | EP - A2 - 0 149 777<br>(ROBERT SCHRÖDER)<br>* Page 5, lines 11-16; fig. 2 *<br>---- | 3 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 25 B 7/00
B 25 B 15/00
B 25 B 13/00
B 25 B 23/00
B 25 B 25/00
B 25 C 5/00
B 25 G 1/00
B 25 G 3/00
B 23 Q 16/00

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| VIENNA | 22-01-1990 | BISTRICH |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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