(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 454 717 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
08.09.2004 Bulletin 2004/37

(51) Int Cl.[7]: **B25C 5/02**

(21) Application number: **03004046.3**

(22) Date of filing: **25.02.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT SE SI SK TR
Designated Extension States:
AL LT LV MK RO

(71) Applicant: **Lin, Jui-Yuan**
Tali City, Taichung Hsien (TW)

(72) Inventor: **Lin, Jui-Yuan**
Tali City, Taichung Hsien (TW)

(74) Representative: **Patentanwälte**
Hauck, Graalfs, Wehnert, Döring, Siemons, Schildberg
Postfach 11 31 53
20431 Hamburg (DE)

(54) **Stapling apparatus with a safety device for staplers to prevent staples from popping out of a stapler**

(57) A stapling apparatus (23) with a safety device for a stapler prevents staples from popping out of the stapler (20) when a user troubleshoots the stapler. The stapling apparatus (23) is pivotally attached to a stapler (20) and has a housing (231), a sliding front cover (24) slidably mounted on the housing (231) and a safety device having a positive stop (11) formed on the housing (231) and a stop lip (12) formed on the sliding front cover (24). The sliding front cover (24) is pushed upward to remove lodged staples, the stop lip (12) abuts the positive stop (11) to limit movement of the sliding front cover (24). Therefore, the staples are still held in the housing (231) by the sliding front cover (24).

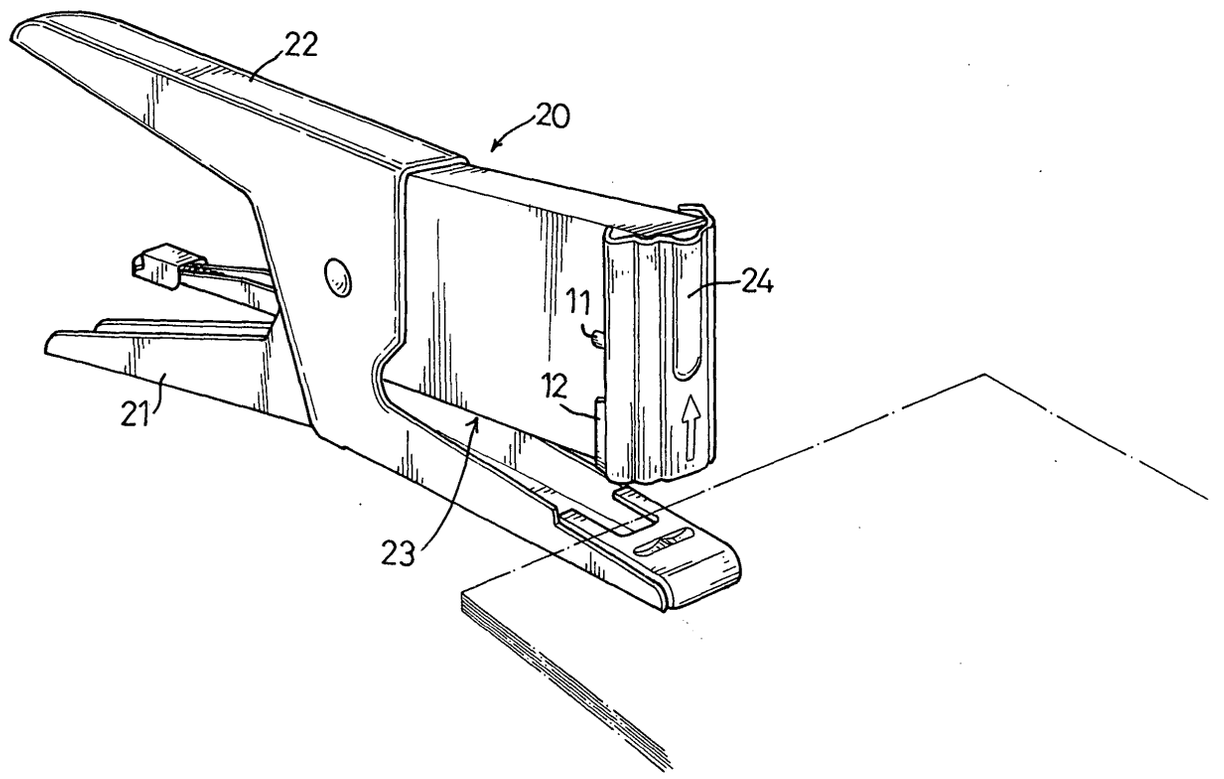

FIG. 1

EP 1 454 717 A1

Description

1. Field of the Invention

[0001] The present invention relates to a stapling apparatus with a safety device, and more particularly to a stapling apparatus with a safety device for a stapler that prevents staples in a stapler from popping out of the stapler.

2. Description of Related Art

[0002] A stapler is a device to connect pieces of paper by means of a staple. With reference to Fig. 4, a conventional stapler (20) comprises a first lever (21), a second lever (22), a stapling apparatus (23) in accordance with prior art and a sliding front cover (24). The two levers (21, 22) are pivotally connected by a pivot pin (not numbered). The first lever (21) has a front end (not shown) opposite the pivot pin. The stapling apparatus (23) is mounted around the front end of the first lever (21) and is pivotally attached to the pivot pin. The stapling apparatus (23) comprises a stapling assembly (not shown), a track (232) and a pushing device (233). The pushing device (233) has a compressed spring (234) that creates a resilient force. A set of staples (50) is slidably mounted on the track (232). The set of staples (50) is held on the track (232) in the stapler (20) by the resilient force of the compressed spring (234) pushing the set of staples (50) into a position where one staple in the set of staples (50) will be pressed by the stapling assembly to connect pieces of paper together. The sliding front cover (24) is movably attached to the stapling apparatus (23) at the front of the first lever (21). The sliding front cover (24) can be pushed upward to conveniently troubleshoot the stapler (20) when the stapler (20) has a problem.

[0003] Occasionally, one of the staples in the set of staples (50) in the stapler (20) will jam or may not be fed smoothly while stapling. Generally, such a state is caused by one of the stapes in the set staples (50) being bent or otherwise jammed in the stapling assembly (23) to keep the stapler (20) from functioning. One way to solve the problem is to remove the staple lodged in the stapling apparatus (23) of the stapler (20) or clear the jammed staple of the set of staples (50). Pushing the sliding front cover (24) upward will provide access to quickly find and easily remove the staple lodged in the stapling apparatus (23). However, when the staple lodged in stapler (20) is removed, the remaining set of staples (50) will be released and pop out of the stapling apparatus (23) because of the resilient force of the pushing device (233). The conventional stapling apparatus of the stapler (20) does not have any safety device to prevent the set of staples (50) in the stapler (20) from popping out of the stapler (20). The conventional stapler (20) is potentially hazardous for a user when the user has to remove a staple lodged in the stapler (20). The ejected staples (50) may injure the user, especially the eyes or somebody near the user.

[0004] To overcome the shortcomings, the present invention provides a stapling apparatus with a safety device for a stapler to mitigate or obviate the aforementioned problems.

[0005] The main objective of the invention is to provide a stapling apparatus with a safety device for a stapler that prevents staples in the stapler from suddenly popping out of the stapler when a user tries to remove a lodged staple that keeps the stapler from functioning.

[0006] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

IN THE DRAWINGS

[0007]

Fig. 1 is an operational perspective view of a stapler having a stapling apparatus with a safety device in accordance with the present invention;

Fig. 2 is a partial exploded perspective view of the stapler in Fig. 1;

Fig. 3a is an enlarged perspective view of the stapler in Fig. 1 with a bent staple that causes the stapler to breakdown;

Fig. 3b is an enlarged perspective view of the stapler in Fig. 1 when a sliding front cover is pushed upward and the staples can be seen to perform troubleshooting; and

Fig. 4 is a perspective view of a conventional stapler in accordance with the prior art with the staples is popping out of the stapler when the sliding front cover is pushed up.

[0008] With reference to Figs. 1 and 2, a stapling apparatus (23) with a safety device for a stapler (20) prevents a set of staples (50) in the stapler (20) from suddenly popping out of the stapler (20) when a user (not shown) tries to troubleshoot the stapler (20). The stapler (20) comprises a first lever (21) and a second lever (22) that are pivotally connected by a pivot pin (not numbered) and has the stapling apparatus (23) with a safety device in accordance with the present invention. Each of the first lever (2 1) and the second lever (22) has a front end (not shown).

[0009] The stapling apparatus (23) is pivotally attached to pivot pin at the front end of the first lever (21) and has a housing (231), a track (232), a pushing device (233), a stapling assembly (not shown) and a safety device (not numbered). The housing (231) has a front (not numbered), a rear (numbered), a bottom (not numbered) and two opposite sides (not numbered). The housing (231) is pivotally attached to the pivot pin and is mounted around the front end of the first lever (21). The track (232) is mounted in the housing (231) and has

an enlarged end (not numbered) extending out of the rear of the housing (231). The stapling assembly, is conventional, is mounted in the housing (231) above the track (232) at the front end of the first lever (21) and is adapted to staple one of the set of staples (50) to fasten paper.

[0010] The set of staples (50) is adapted to be slidably mounted on the track (232) and has a top (not numbered). The track (232) allows the set of staples (50) to slidably move toward the front of the housing (231) where one staple (50) is pressed to fasten pieces of paper together by the stapling assembly. To push the set of staples (50) toward the front of the housing (231), the pushing device (233) is attached to the track (232) between the set of staples (50) and the enlarged end of the track (232). The pushing device (233) has a compressed spring (234) that provides a resilient force to push the set of staples (50) toward the front of the housing (231).

[0011] When the two levers (21, 22) are squeezed toward each other, the housing (231) is firstly pivoted by the first lever (21) until it abuts the second lever (22). By continuously squeezing the two levers (21, 22) together, the front end of the first lever (21) will pivotally drive the stapling assembly to press one staple in the set of staples (50) and staple the paper.

[0012] The sliding front cover (24) has a bottom (not numbered) and two opposite sides (not numbered). The sliding front cover (24) is movably attached to the front of the housing (231) to allow convenient access to the stapler (20) to clear a staple (not shown) lodged in the housing (231) that keeps the stapler (20) from functioning properly.

[0013] The safety device is formed on the housing (231) and the sliding front cover (24) and comprises a positive stop (11) and a stop lip (12). The positive stop (11) is formed on and protrudes from one side of the housing (231) adjacent to the sliding front cover (24). The stop lip (12) protrudes from the sliding front cover (24) at one side below the positive stop (11) and corresponds to the positive stop (11).

[0014] With reference to Figs. 3a and 3b, removing a bent staple (51) or jammed staples (not shown) from the stapler (20) requires that the sliding front cover (24) be pushed upward to quickly remove the bent staple (51) lodged in the stapler (20). When the sliding front cover (24) is pushed upward, the stop lip (12) will abut the positive stop (11) and will keep the sliding front cover (24) from moving up any further. With the stop lip (12) abutting the positive stop (11), the bottom of the sliding front cover (24) is lower that the top of the set of staples (50). Thereafter, the lodged bent staple (51) can be easily found and removed or jammed staples are easily to be rearranged. In any case, the set of staples (50) are still held on the track (232) in the housing (231) by the sliding front cover (24), and the stapler (20) is immediately used to connect or fasten pieces of paper together after the lodged bent staple (51) is removed.

[0015] The safety device prevents any possibility of the set of staples (50) on the track (232) from popping out of the housing (231) as the sliding front cover (24) is pushed upward. Without the safety device, the stapler (20) is quite a dangerous piece of office equipment for a user who perhaps uses it everyday. The safety device for the stapler (20) enhances the safety of the stapler (20) as described in the foregoing description. The stapler (20) with the safety device operates safely and prevents the user away from being injured.

[0016] Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

Claims

1. A stapling apparatus (23) with a safety device for a stapler (20) having a first lever (21) with a front end and a second lever (22) pivotally connected together by a pivot pin, the stapling apparatus (23) comprising

a housing (231) adapted to be pivotally attached to the pivot pin and mounted around the front end of the first lever (21) and having a front, a bottom and two opposite side;
a track (232) mounted in the housing (231) and adapted to position a set of staples (50) with a top toward the front of the housing (231);
a pushing device (233) attached to the track (232) and having a compressed spring (234) that provides a resilient force to push the set of staples (50) toward the front of the housing (231);
a stapling assembly mounted in the housing (231) above the track (232) at the front end of the first lever (21) and adapted to staple one of the set of staples (50) to fasten paper together;
a sliding front cover (24) having a bottom and two opposite sides slidably mounted on the front of the housing (231) to conveniently remove staples that are jammed; and
a safety device attached between the housing (231) and the front slide cover (24) and the safety device comprising
a positive stop (11) formed on the housing (231) adjacent to the sliding front cover (24); and
a stop lip (12) formed on the sliding front cover (24) and corresponding to the positive stop (11), where the positive stop (11) abuts the stop lip (12) to limit movement of the sliding front

cover (24) such that the bottom of the sliding front cover (24) is lower than the top of the set of staples (50) whereby the set of staples (50) are held on the track (232) in the housing (231) by the sliding front cover (24) when the sliding front cover (24) is pushed upward when troubleshooting the stapler (20).

2. The stapling apparatus as claimed in claim 1, wherein

the positive stop (11) is formed at one side of the housing (213) adjacent to the sliding front cover (24); and
the stop lip (12) is formed at one side of the sliding front cover (24) and corresponds to the positive stop (11).

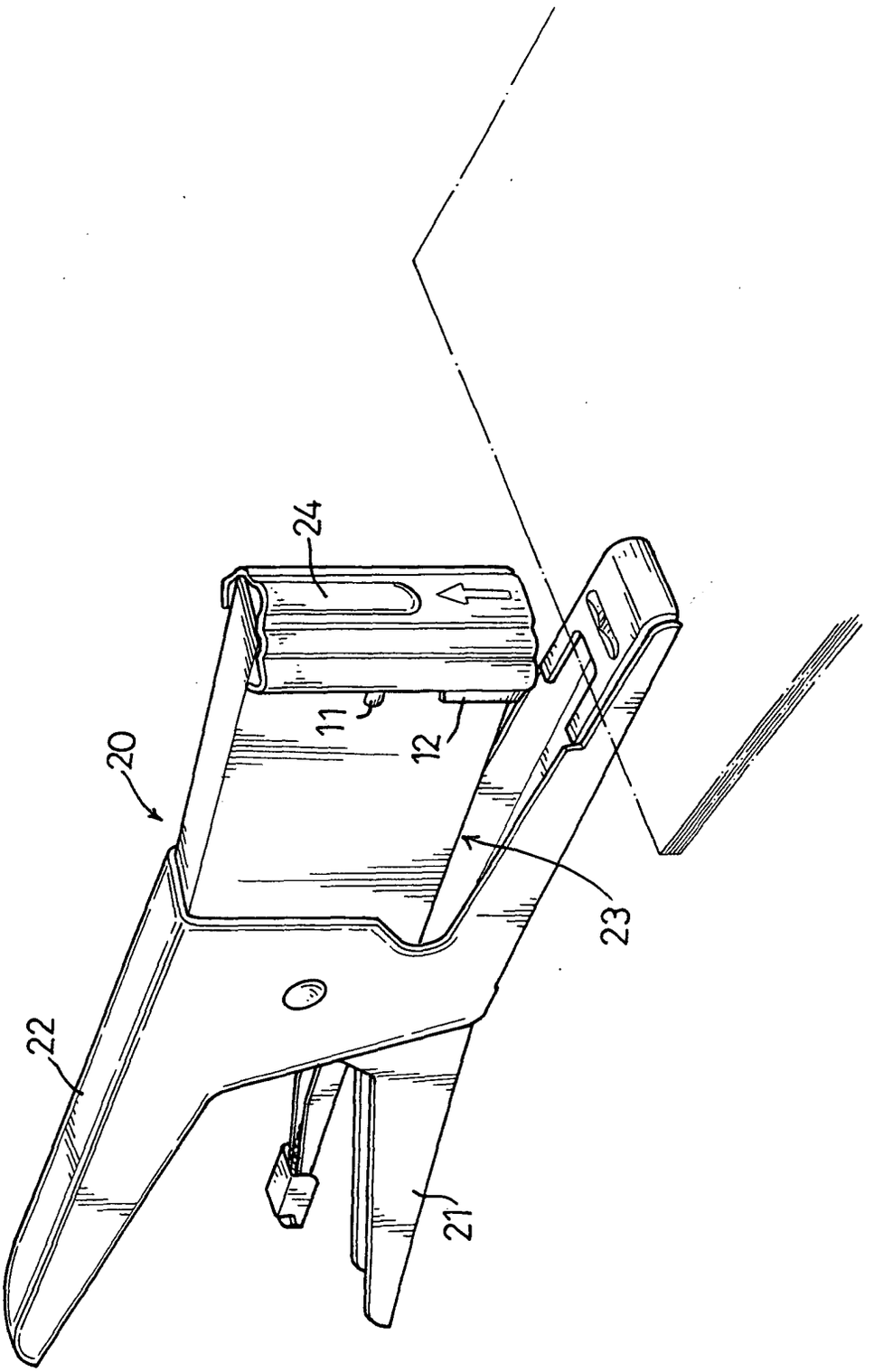

FIG. 1

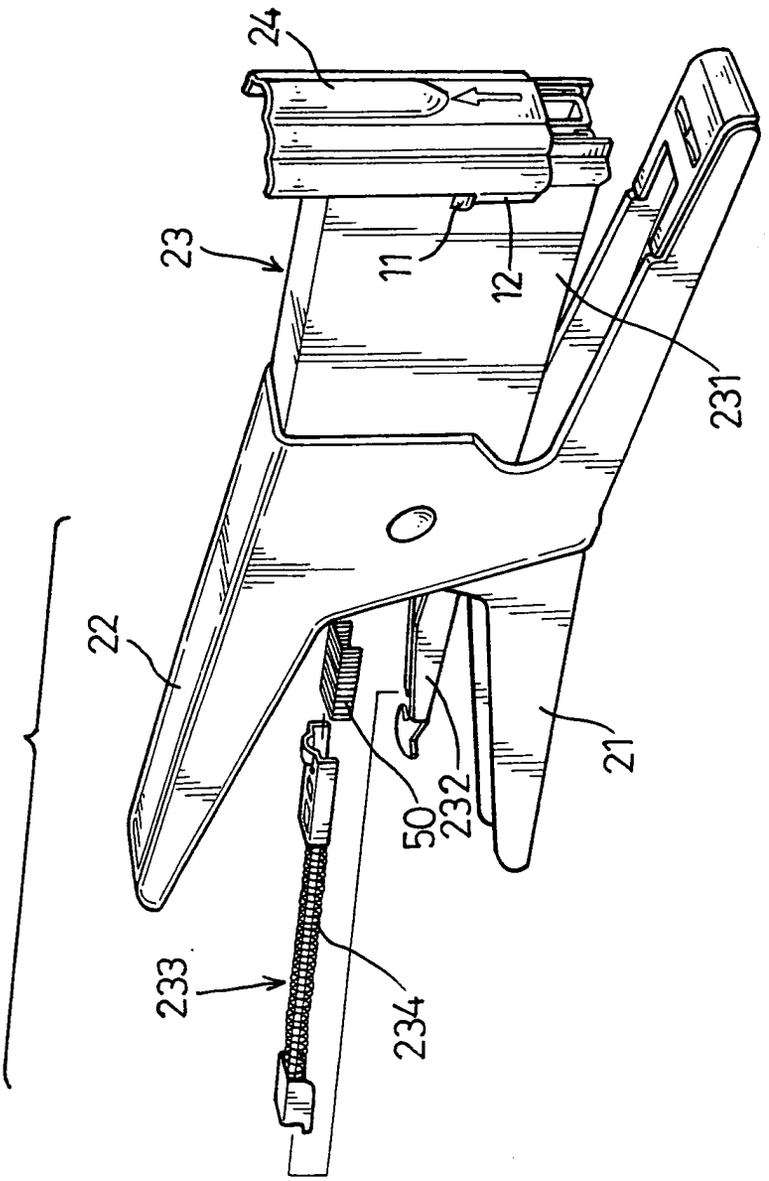

FIG. 2

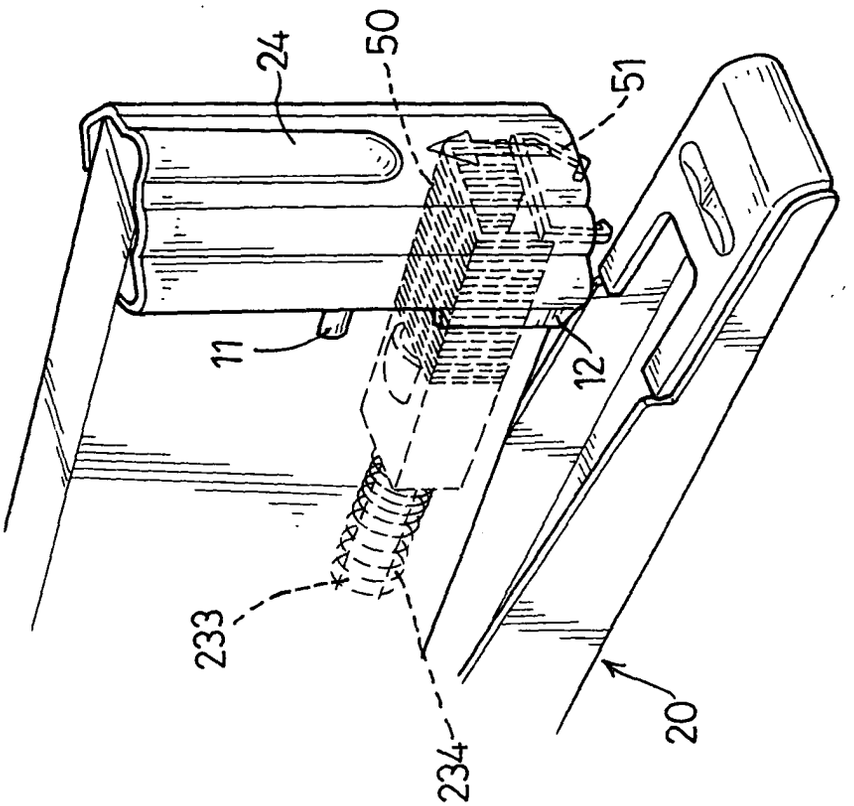

FIG. 3a

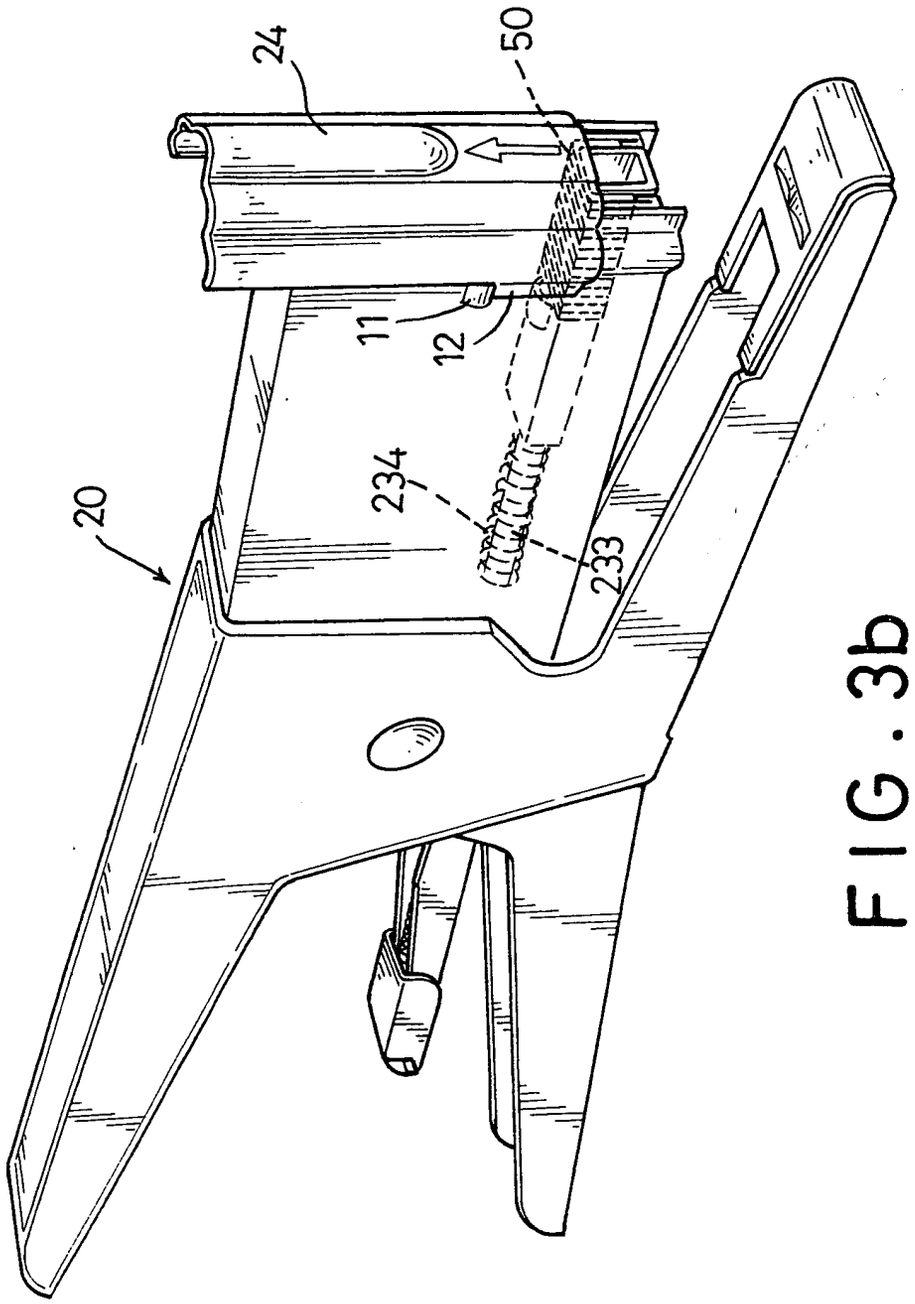

FIG. 3b

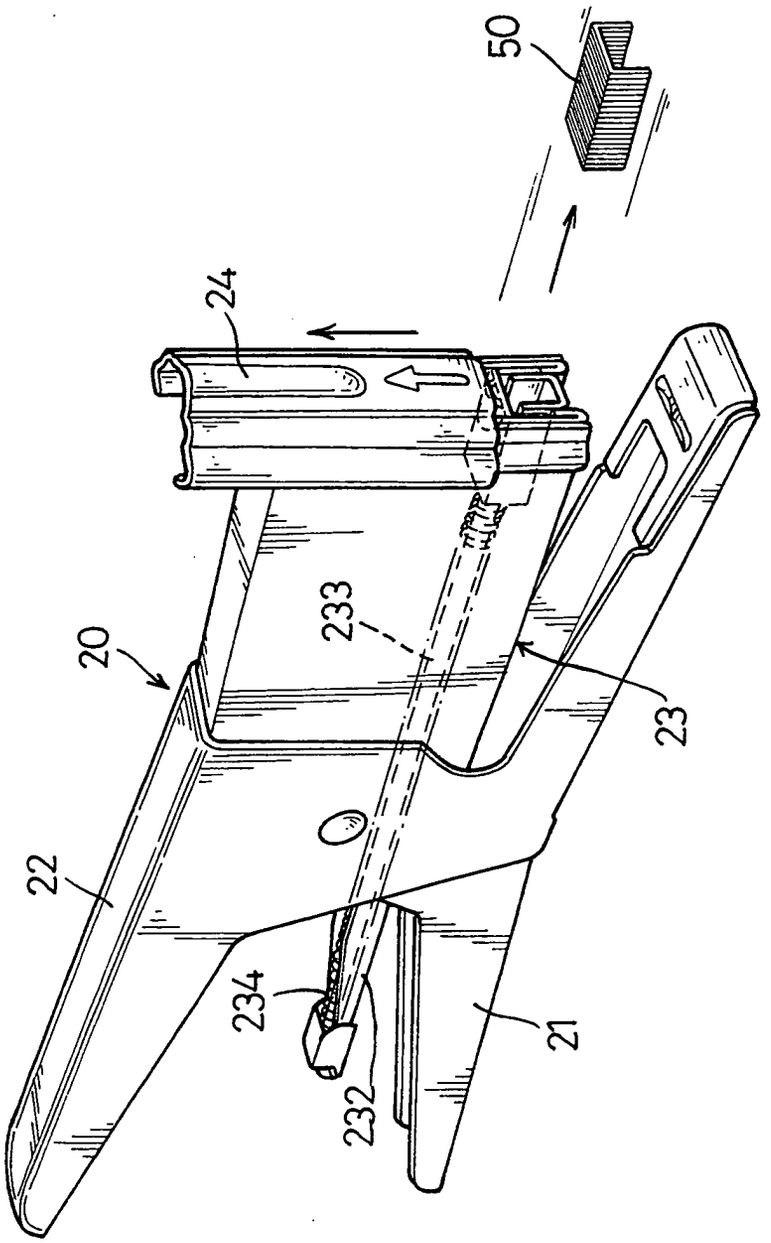

FIG. 4
PRIOR ART

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 00 4046

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.7)
A	US 2 283 873 A (MAX VOGEL) 19 May 1942 (1942-05-19) * column 2, line 3-9; figures 10-12 * * column 5, line 58 - column 6, line 6 *	1,2	B25C5/02
A	EP 1 016 501 A (NAGAI WORKS CO LTD) 5 July 2000 (2000-07-05) * column 1, paragraphs 2-4; figures 15A,15B *	1,2	
A	GB 2 149 338 A (OLAVE SOLOZABAL Y CIA S A) 12 June 1985 (1985-06-12) * abstract; figure 1 *	1,2	
A	JP 60 194483 U (ERUMU KOGYO K.K.) 25 December 1985 (1985-12-25) * figures 1,2,6 *	1,2	
A	JP 61 092575 U (MAX CO., LTD.) 16 June 1986 (1986-06-16) * figures 1-3 *	1,2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B25C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31 July 2003	Popma, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 00 4046

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-07-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2283873 A	19-05-1942	NONE	
EP 1016501 A	05-07-2000	WO 9839143 A1	11-09-1998
		EP 1016501 A1	05-07-2000
		US 6179193 B1	30-01-2001
GB 2149338 A	12-06-1985	NONE	
JP 60194483 U		NONE	
JP 61092575 U		NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82