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(54) **Combination closing device for bags or similar items**

(57) The present invention refers to a closing device for bags or similar items comprising a male piece (1) and a female piece (2). The male piece (1) is fitted with a pressbutton (3) suited to engaging with an external flange (4) of the female piece (2) to hold the male piece (1) in engagement with the female piece (2) and the pressbutton (3) is positioned in a cavity (6) of the male piece (1) so that it can be moved from a protruding position to a position aligned with the external profile of the male piece (1). The cavity (6) of the male piece (1) includes cam wheels (13, 14) which normally rotate inter-

grally with combination wheels (15, 16) that can be accessed from outside and side arms (17, 18) adjacent to the cam wheels (13, 14) and elastically stressed in side engagement with them so as to assume, in function of the angular position of the cam wheels (13, 14), a locking position of the pressbutton (3) in which said side arms (17, 18) prevent the pressbutton (3) from penetrating inside the cavity (6) in order to align with the external profile of the male piece (1), and a release position of the pressbutton (3) in which the arms (17, 18) leave the same pressbutton (3) free to move between said protruding position to said aligned position.

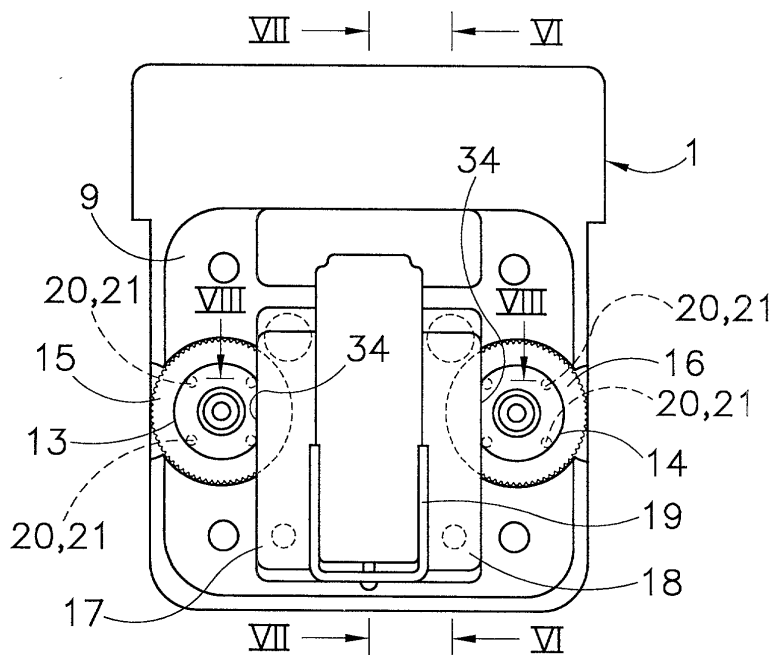


FIG. 5

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Description

[0001] The present invention refers to a combination closing device for bags or similar items.

[0002] Closing devices for bags are generally known, in particular for leather bags, that comprise a male piece connected to a first flap of the bag and a female piece connected to a second flap of the bag; the male piece is fitted with a pressbutton that engages with the female piece to connect and block the two flaps together, thus closing the bag.

[0003] These closing devices enable the bag to be opened by simply pressing the pressbutton of the male piece, showing in this manner that they are not very safe and are easy for possible pick-pocketing.

[0004] Up to now closing devices of this type in which the pressbutton opening movement depends on a certain numerical combination being formed are not known.

[0005] In view of the state of the technique described, scope of the present invention is to produce a pressbutton-closing device which is fitted with a combination enabling mechanism.

[0006] In accordance with the present invention, this scope is reached by means of a closing device for bags or similar items comprising a male piece and a female piece, said male piece being fitted with a pressbutton suited to being engaged with an external flange of said female piece to hold said male piece engaged with said female piece, said pressbutton being positioned in a cavity of said male piece so that it can be moved from a protruding position to a position in line with the external profile of said male piece, characterized in that said cavity of said male piece includes cam wheels that normally rotate in integrally with combination wheels that are accessible from the outside, and side arms adjacent to said cam wheels which are elastically stressed in side engagement with them so as to assume, in function of the angular position of said cam wheels, a pressbutton locking position in which said side arms prevent the pressbutton from entering said cavity in order to be aligned with the external profile of the male piece, and a pressbutton release position in which said arms leave the same pressbutton free to move between said protruding position and said aligned position.

[0007] Thanks to the present invention it is thus possible to produce a closing device for bags which, by means of combination locking of the pressbutton of the male piece when the latter is engaged with the female piece, prevents easy opening maneuvers from being carried out by ill-intentioned people.

[0008] The characteristics and advantages of the present invention will appear evident from the following detailed description of an embodiment thereof, illustrated as non-limiting example in the enclosed drawings, in which:

Figure 1 is a front view of a closing device in accordance with the present invention;

Figure 2 is a side view of the closing device of Figure 1;

Figure 3 is a view similar to that of Figure 1 but with the male piece and the female piece of the closing device separated;

Figure 4 is a view similar to that of Figure 2 but with the male piece and the female piece of the closing device separated;

Figure 5 is a rear view of the male piece of the closing device according to the invention;

Figure 6 is a section according to line VI-VI of the male piece of Figure 5;

Figure 7 is a section according to line VII-VII of the male piece of Figure 5;

Figure 8 is a section according to line VIII-VIII of the male piece of Figure 5;

Figure 9 is a section similar to the section of Figure 7 but with pressbutton pressed;

Figure 10 is a section similar to the section of Figure 8 but with pressbutton pressed;

Figure 11 is a rear view of the male piece of the closing device according to the invention in the locking position;

Figure 12 is a section according to line XII-XII of the male piece of Figure 11.

[0009] With reference to Figures 1-12 a closing device for bags and similar items in accordance with the present invention is shown. Said device is made up of two pieces, a male piece 1 and a female piece 2, designated to be fastened to two different flaps 41, 42 of a bag, suitcase, shoulder bag or similar item.

[0010] The male piece 1 is fitted with a pressbutton 3 which engages with an external flange 4 of the female piece 2 in the closing position of the bag or similar item where the pressbutton 3 protrudes in relation to the external profile of the male piece, as shown in Figures 1 and 2.

[0011] To open the bag a slight pressure has to be made on pressbutton 3 so that it is aligned with the external profile of the male piece 1 thus unhooking from flange 4 and therefore freeing the male piece 1 from the female piece 2, as shown in Figures 3 and 4.

[0012] As shown in Figures 5-8 the pressbutton 3 is positioned in a cavity 6 of the male piece 1, closed at the rear by a plate 32 (removed in Figure 5), and is stressed by a transversal spring 7, which has one end against an internal wall of the male piece 1, and which permits the pressbutton 3 to protrude in relation to the external profile of the male piece 1 (Figures 6-8).

[0013] The pressbutton 3 is held inside the cavity 6 by the abutment of one end 8 with a front wall 9 of the male piece 1 when the pressbutton 3 protrudes in relation to the external profile of the male piece 1, as can be seen in Figure 7. At the other end of the pressbutton 3 an axial housing 12 is provided into which a pin 10 and a spring 11 are inserted.

[0014] A pair of cam wheels 13, 14 (circular wheels

with a cut part 34) and a pair of numbered combination wheels 15, 16 coaxially overlaying the former are also positioned laterally in the cavity 6 of the male piece 1. Both the cam wheels 13, 14 and the numbered wheels 15, 16 are pivoted in a swiveling manner to the front wall 9 of the male piece 1 at the sides of the pressbutton 3, as can be seen in Figures 5, 8, 9, 11 and 12. In a position adjacent to the cam wheels 13, 14 side arms 17, 18 are positioned with a U-shaped spring 19 placed between them and suited to pushing the arms laterally towards the cam wheels 13, 14. The latter have notches 20 on their upper surface which engage with respective protrusions 21 of the wheels 15, 16, so as to normally rotate integrally with them under the thrust of the springs 33.

[0015] The cam wheels 13, 14, the numbered wheels 15, 16, the side arms 17, 18 and the U-shaped spring 19 determine the locking and releasing positions of the pressbutton 3 of the male piece 1.

[0016] With the wheels 13, 14 and 15, 16 in the release position corresponding to the preset combination (Figures 5-8), the U-shaped spring 19 pushes the side arms 17, 18 against the cut part 34 of the cam wheels 13, 14 thus creating a passage area 60 inside the cavity 6, suited to receiving a rear portion 30 of the pressbutton 3. In this manner the pressbutton 3 is free to protrude externally in relation to the profile of the male piece 1, as can be seen in Figures 6-8, but also to be forced to align with the external profile of the male piece 1, with the portion 30 inside the area 60, as can be seen in Figures 9 and 10, to enable the male piece 1 to be disconnected from the female piece 2 when the bag or similar item has to be opened.

[0017] The locking position of the pressbutton 3 is determined by a rotation of the cam wheels 13 and 14 which brings a circular part as part of the wheel adjacent to the side arms 17 and 18. A pushing action of the same cam wheels 13, 14 on the side arms 17 and 18 results from this obliging them to partially occupy the passage area 60 of the cavity 6, preventing the portion 30 of the pressbutton 3 from entering the area 60 and the same pressbutton 3 from aligning with the external profile of the male piece 1, as can be seen in Figures 11 and 12. If the pressbutton 3 of the male piece 1 is engaged with the external flange 4 of the female piece 2, the bag or similar item remains blocked in the closed position.

[0018] The lock and release numerical combination of the pressbutton 3 is made stable by the engagement of the notches 20 of the cam wheels 13, 14 with the protrusions 21 of the numbered wheels 15, 16. Nevertheless the user can change this preset combination to decide new lock and release positions of the pressbutton 3 by pressing the same pressbutton and adjusting the wheels 15, 16 to determine a related movement of the numbered wheels 15, 16 in relation to the cam wheels 13, 14; the desired position, corresponding to a certain number on the wheels 15, 16, is determined by a new engagement of the notches 20 of the cam wheels 13, 14 with the protrusions 21 of the wheels 15, 16.

Claims

1. Closing device for bags or similar items comprising a male piece (1) and a female piece (2), said male piece (1) being fitted with a pressbutton (3) suited to be engaged with an external flange (4) of said female piece (2) to hold said male piece (1) engaged with said female piece (2), said pressbutton (3) being positioned in a cavity (6) of said male piece (1) so that it can be moved from a protruding position to a position aligned with the external profile of said male piece (1), **characterized in that** said cavity (6) of said male piece (1) includes cam wheels (13, 14) which normally rotate integrally with the combination wheels (15, 16) that are accessible from the outside and side arms (17, 18) that are adjacent to said cam wheels (13, 14) and stressed elastically in side engagement with them so as to assume, in function of the angular position of said cam wheels (13, 14), a locking position of the pressbutton (3) in which said side arms (17, 18) prevent the pressbutton (3) from penetrating inside said cavity (6) in order to align with the external profile of the male piece (1), and a release position of the pressbutton (3) in which said arms (17, 18) leave the same pressbutton (3) free to move between said protruding position and said aligned position.
2. Device according to claim 1, **characterized in that** in said release position of the pressbutton (3) said side arms (17, 18) are adjacent to cut parts (34) of said cam wheels (13, 14) so as to define inside said cavity (6) a passage area (60) suited to receive a portion (30) of said pressbutton (3).
3. Device according to claim 2, **characterized in that** in said locking position of the pressbutton (3) said side arms (17, 18) are adjacent to circular parts of said cam wheels (13, 14) so as to occupy said passage area (60) suited to receiving said portion (30) of said pressbutton (3).
4. Device according to claim 1, **characterized in that** said combination wheels (15, 16) are fitted on the surface with protrusions (21) which engage with notches (20) of said cam wheels (13, 14) according to a preset numerical combination so as to define said locking and release positions of said pressbutton (3).
5. Device according to claim 4, **characterized in that** said numerical combination is changed by adjusting said pressbutton (3) and said combination wheels (15, 16) to determine a relative rotation movement of said combination wheels (15, 16) in relation to said cam wheels (13, 14).
6. Device according to claim 1, **characterized in that**

it comprises a pair of said cam wheels (13, 14), a pair of said combination wheels (15, 16), and a pair of said side arms (17, 18).

7. Device according to claim 1, **characterized in that** said side arms (17, 18) are elastically stressed by means of a spring (19) placed between them suited to pushing them into engagement with said cam wheels (13, 14).

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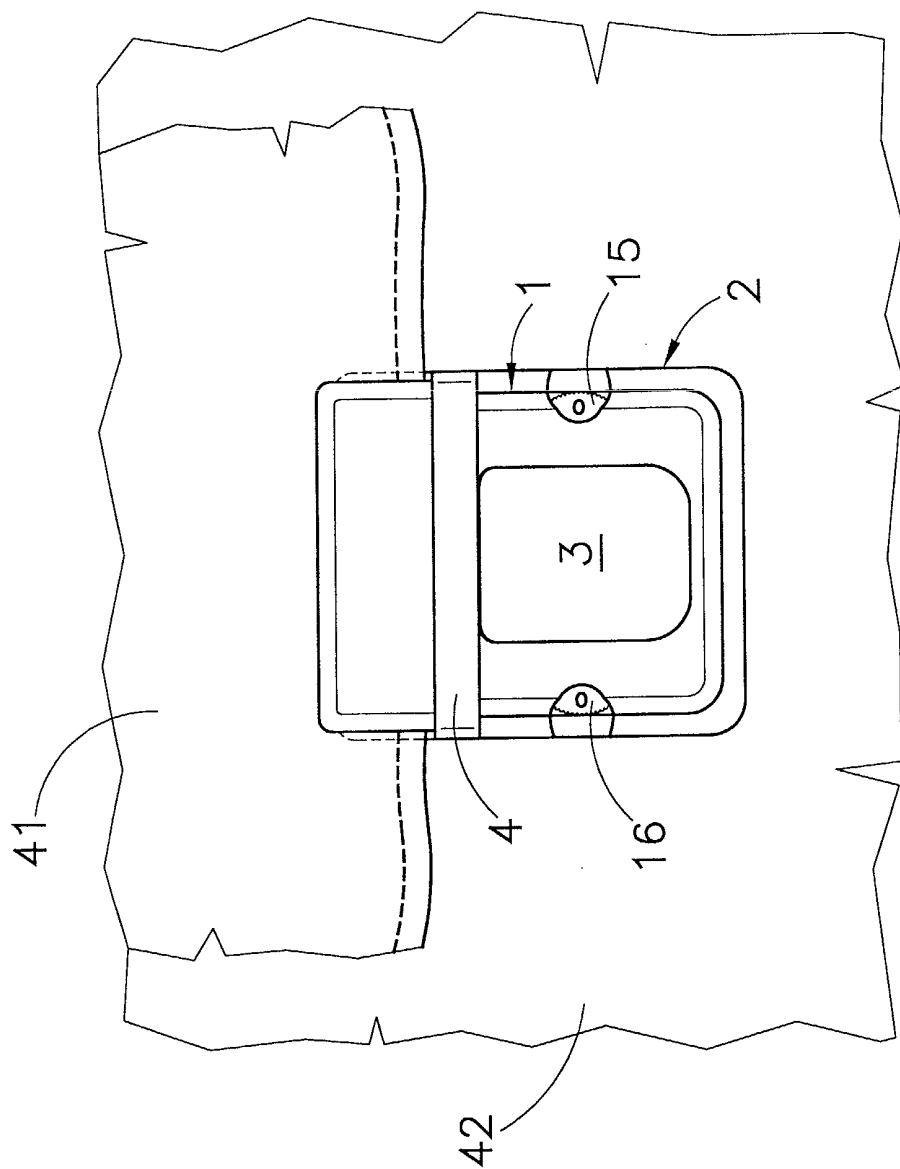


FIG. 1

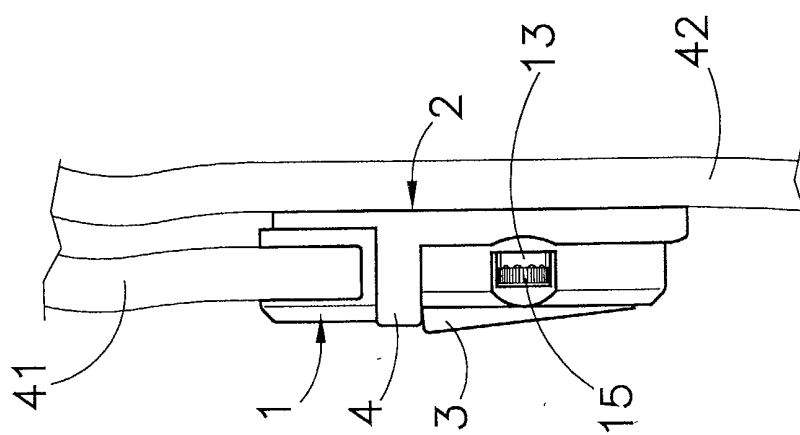


FIG. 2

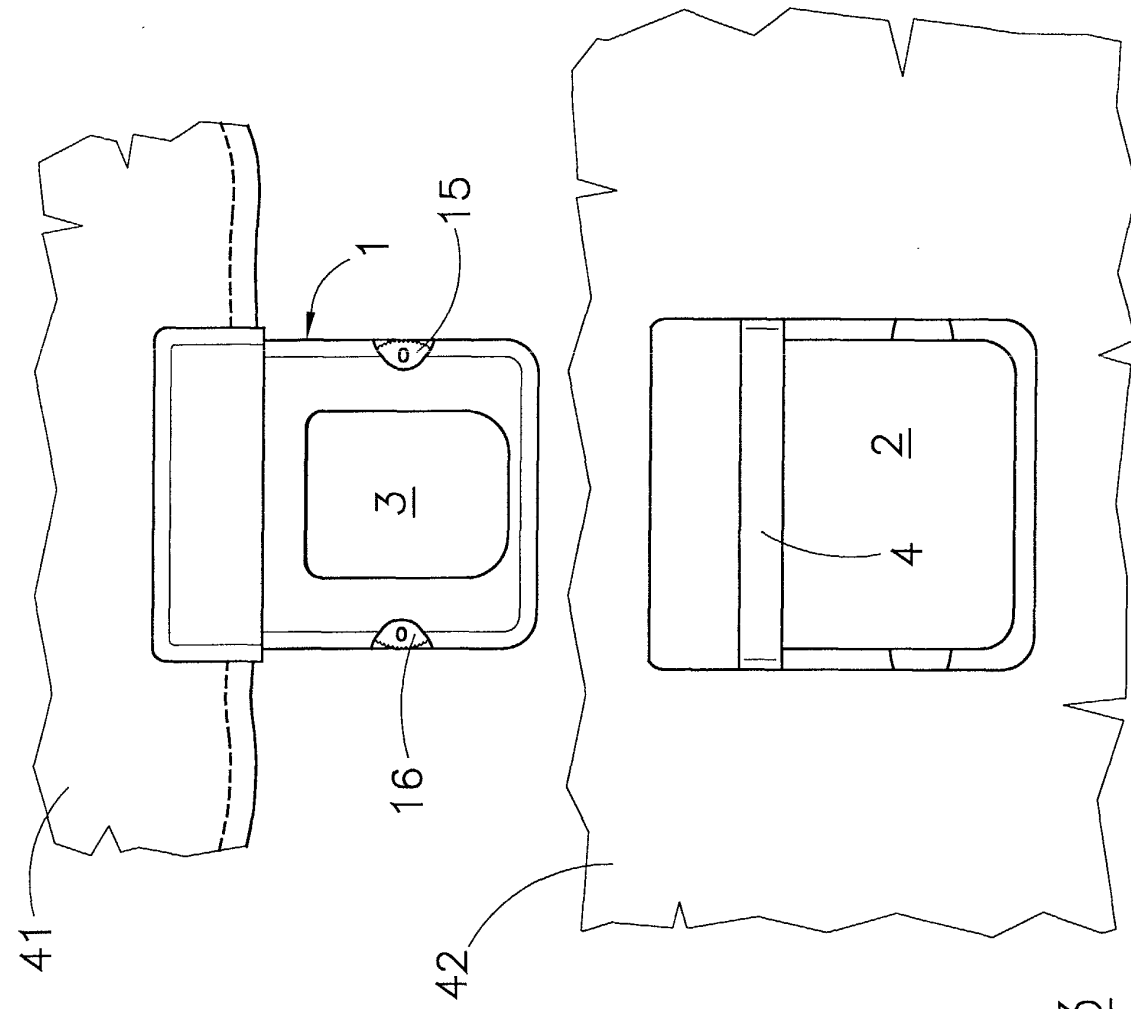


FIG. 3

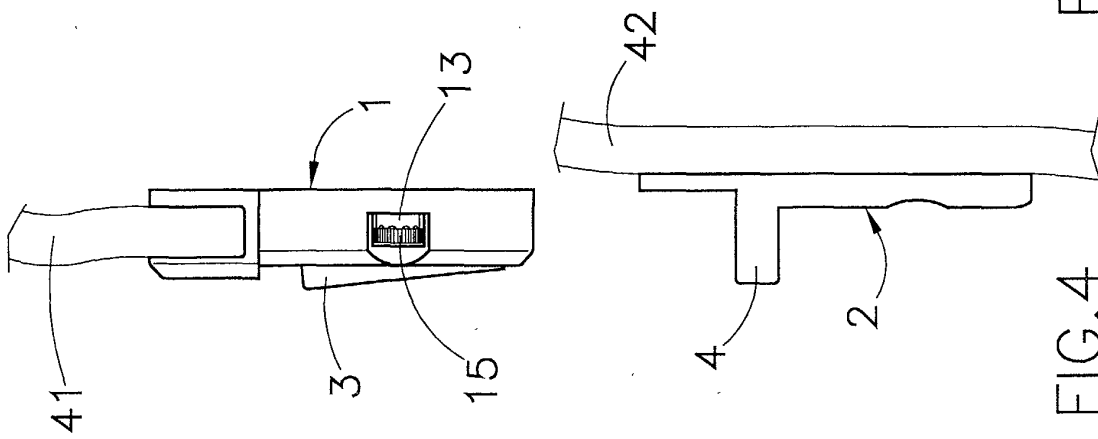


FIG. 4

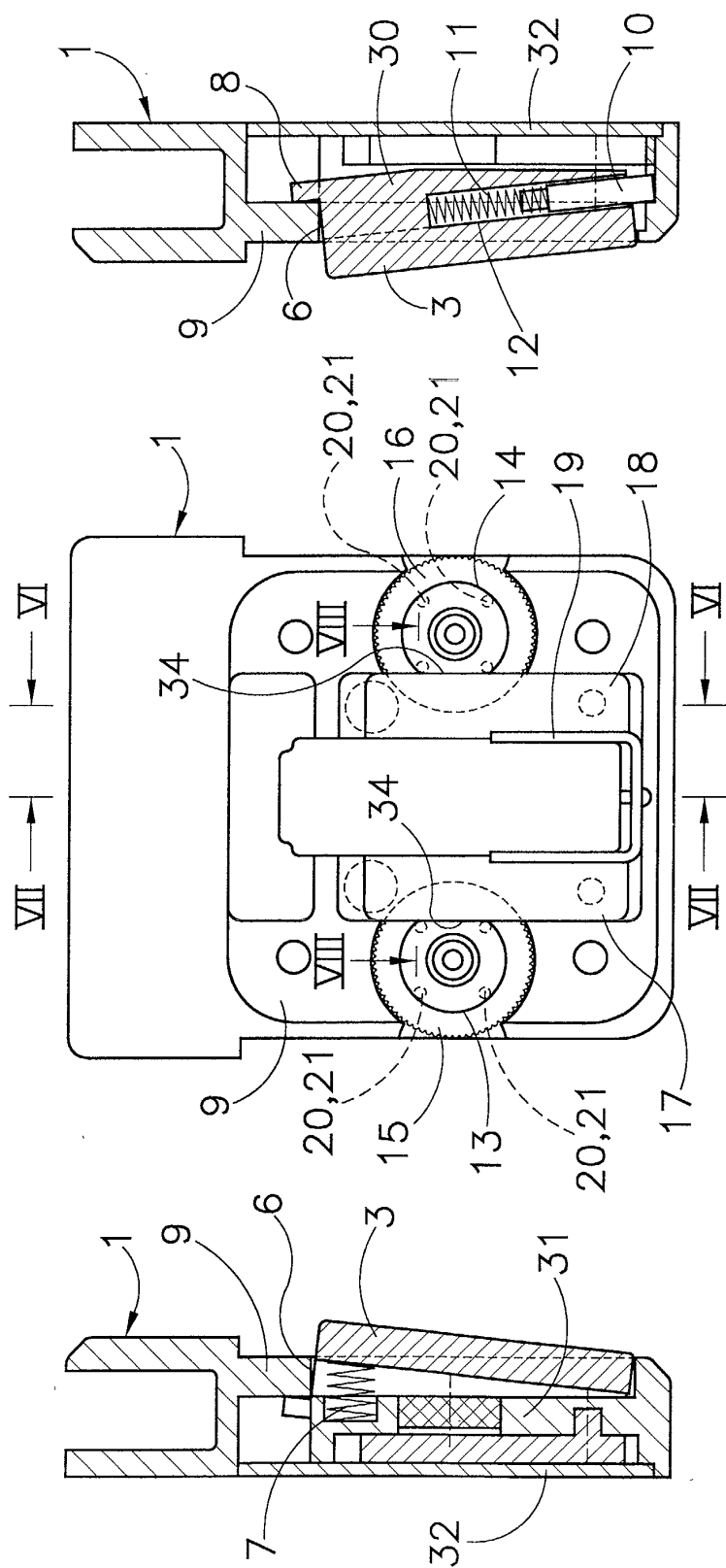


FIG. 6

FIG. 7

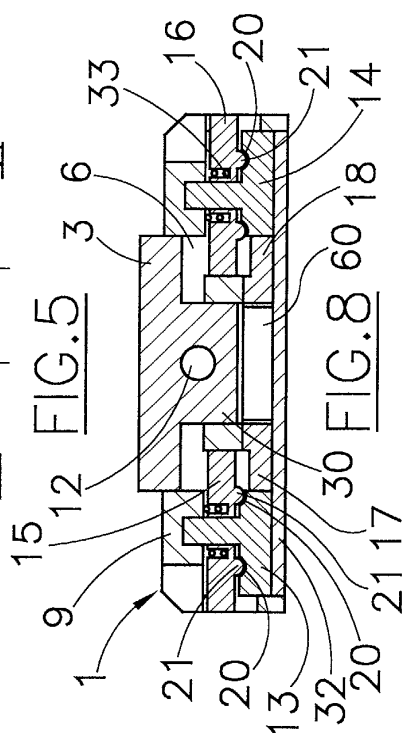
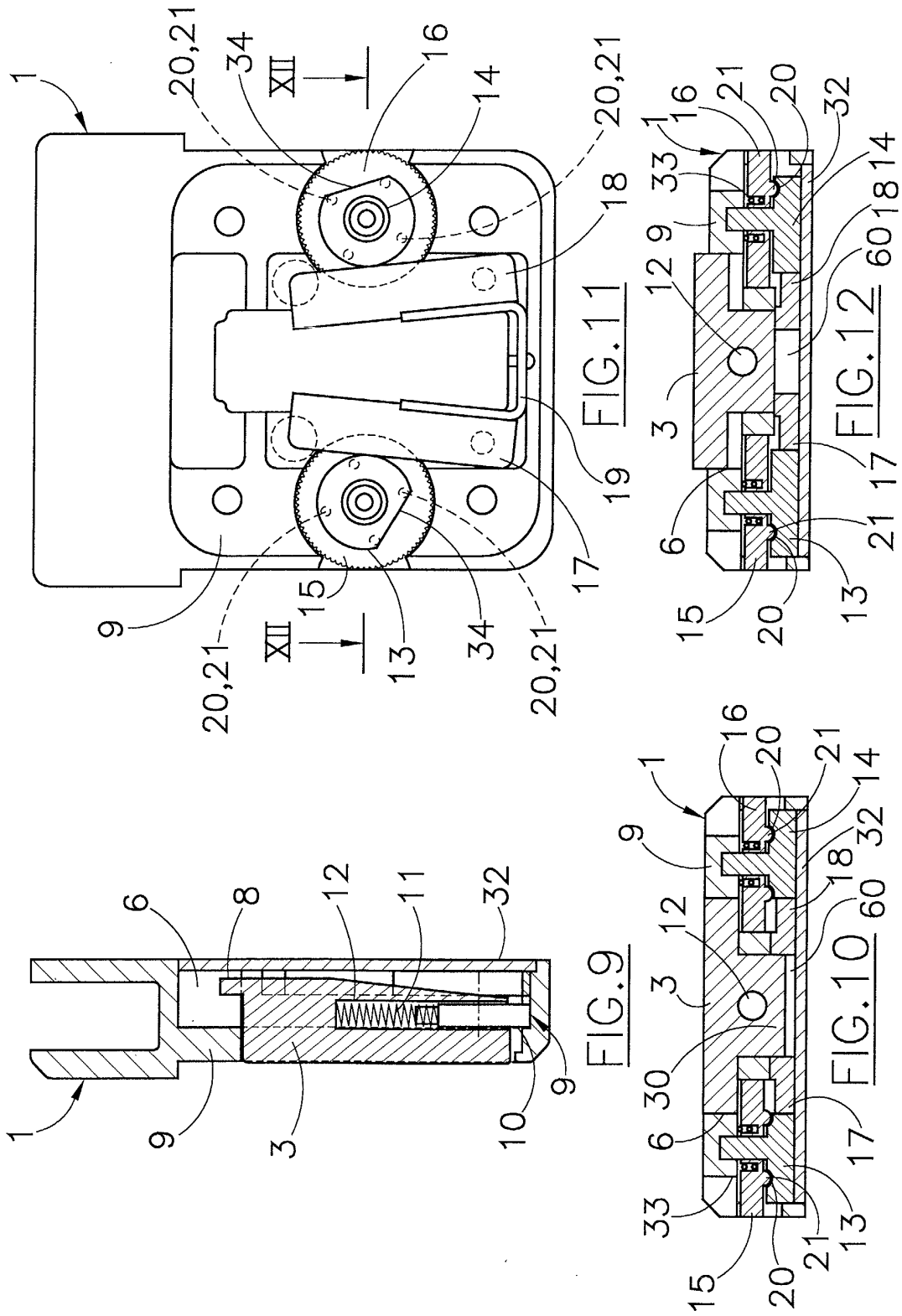


FIG. 5

FIG. 8





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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5490

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 4 548 059 A (RUEGG HEINZ) 22 October 1985 (1985-10-22) * the whole document * -----	1-7	E05B37/12
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E05B A44B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 18 December 2002	Examiner Horubala, T
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 42 5490

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
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18-12-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4548059 A	22-10-1985	DE 8317602 U1 GB 2129483 A ,B	19-01-1984 16-05-1984

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