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

(11) Publication number: **0 500 998 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **91105224.9**

(51) Int. Cl.5: **E05C 9/02**

(22) Date of filing: **28.03.91**

A request for correction by addition of a figure "E" has been filed pursuant to Rule 88 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 2.2).

(43) Date of publication of application:
02.09.92 Bulletin 92/36

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB IT LI LU NL SE

(71) Applicant: **IMBERWOOD LTD.**
23 Barleymow Close
Chatham, Kent ME5 8JZ(GB)

(72) Inventor: **Andrews, Brian Arthur**
23 Barleymow Close
Chatham, Kent, ME5 8JZ(GB)

(54) Automatic locking device.

(57) A device for incorporation into deadbolt, and multipoint lever operated locks, with or without deadbolt facilities, which enabled the lock to function as follows:-

In order to lock the system, the lever handle (8) is lifted. The locking points and deadbolt, if fitted are now positioned and locked automatically, the lever returns to the horizontal. Use of the cylinder (9) is not required.

Releasing the lock and arming the device is done in the following way. Rotate the cylinder (9) 360° to release the lock and arm the block (10) (B) in the horizontal plane against the action of spring (11). Depress the lever handle (8). The locking points, the latch and the deadbolt, if fitted, are retracted to the unlocked position. The device (B) is now armed in the vertical plane.

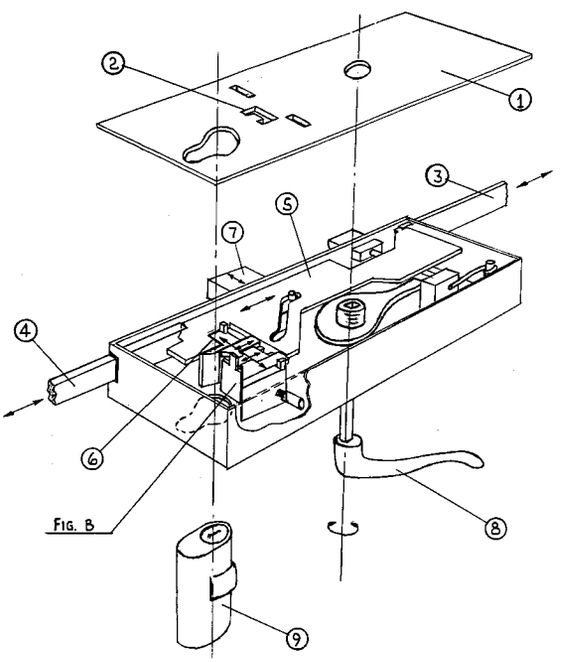

FIG. A

EP 0 500 998 A1

Field of Application:-

The Lock Industry with reference to Deadbolt and Multipoint Locks

Background and Description of Prior Art:-

With regard to "Multipoint Locks" Locks having multiple locking points and latch. With or without deadbolt and being lever handle operated and key secured via a cylinder, or being key operated and key secured.

Lever Operated Multipoint locks are, throughout the industry, recognised as devices in which the lever handle positions the locking points and in which the key/knob cylinder secures them. These locks form three main groups, as described hereunder.

Group 1. In which the lever handle operates the latch and positions the multiple locking points and the deadbolt and in which the cylinder secures the pre-positioned mechanism.

Group 2. In which the lever handle operates the latch and the multiple locking points and in which the cylinder both positions and secures the deadbolt, simultaneously securing the pre-positioned multipoint mechanism.

Group 3. A smaller group, in which the multiple locking points and the deadbolt are primed under spring tension and can therefore be released into their locking position by, either moving the lever handle, which also operates the latch or by a release pin which is activated by closing the door into which the lock is fitted. This group still requires the cylinder to be activated in order to secure the pre-positioned mechanism.

Literature identifying the mechanisms described in groups one, two and three include the following:-

Group 1
- Maco UK (lock without deadbolt)
  Maco Door & Window Hardware (UK) Ltd
  Publication No 49264 Dated 6/88.
- Maco UK (lock with deadbolt)
  Maco Door & Window Hardware (UK) Ltd
  Publication No 49342 dated July 1990.
- K.F.V (As 4000 lock without deadbolt)
  Karl Fliether GMBH & Co
  Publication titled for Wood, Metal and UPVC Doors.
- Fuhr Multisafe (353 lock without deadbolt)
  Carl Fuhr GMBH & Co
  Publication GB/MI dated 10/89.
- Fuhr Multisafe (459 lock without deadbolt)
  Carl Fuhr GMBH & Co
  Publication GB/MI dated 10/89.

Group 2
- KFV (As 4050, 4350, 4354 locks with deadbolt)
  Karl Fliether GMBH & Co
  Publication titles "For Wood, Metal and UPVC Doors".
- Fuhr Multisafe (365/365R locks with deadbolt)
  Carl Fuhr GMBH & Co
  Publication GB/MI dated 10.89.
- Roto (R627, R626 series locks with deadbolt)
  Roto Frank Ltd
  Publication PB 123-0 GB not dated

Group 3
- Fuhr Multisafe (365 RS lock with deadbolt)
  Cart Fuhr GMBH & Co
  Publication GM/MI dated 10/89

Key Operated multipoint locks are throughout the industry, recognised as devices in which the key/knob cylinder both positions and secures the locking points. These locks form a fourth group as described hereunder.

Group 4. In which the lever handle operates the latch and in which the cylinder both positions and secures the multiple locking points and deadbolt, if fitted.

Literature identifying the mechanisms described in group 4 include the following:-

Group 4
- KFV (As 2300, 8250 locks with or without deadbolt)
  Karl Fliether GMBH & Co.
  Publication titled "Multi Point Security Lock" AS 2300.
  Publication titled "Multi Point Security Lock" AS 8250 not dated.
- Fuhr Multisafe (455 locks with or without deadbolt)
  Carl Fuhr GMBH & Co.
  Publication GB/MI dated 10.89.

Disclosure:- "AUTOMATIC LOCKING DEVICE"

Problems related to prior art, lever and key operated, multipoint locks, as described under the heading Background and Description or prior art, are described hereunder.

To lock a multipoint lever operated lock as described in groups 1 to 2 it is necessary to operate both the lever handle and the cylinder. Locks in group 3 represent an attempt to reduce the number of operations required to position and lock a multipoint lever operated lock from two to one, however, the use of a key is still required.

To lock a multipoint key operated lock as described in group 4 it is necessary to operate the

key through three revolutions to position and secure the lock. Therefore the use of a key is necessary to secure the lock.

UNITY OF INVENTION

The functions of the **"Automatic Locking Device"** as described under the heading **Inventive Step**, indicate the underlying principles of the device. The dimensions layout and means of providing pressure may vary to accommodate various lock designs. **The underlying principles of the device represent the technical features for which patent is sought**.

Drawing A depicts the **"Automatic Locking Device"** positioned within an existing lock design. Drawing B is an exploded view of the device shown incorporated in drawing A. Drawings C and D depict two further methods of constructing the **"Automatic Locking Device"**.

Each method varies in construction but utilized the same technical features. These variants are not considered to be the only designs by which the **"Automatic Locking Device"** can be constructed. They are merely included to demonstrate that the unique technical features described under the heading Disclosure, in the paragraph entitled "The inventive step", can be utilized in various ways which still represent the **"Automatic Locking Device"**, and that any devise which is primed under pressure horizontally via the cylinder to enable the subsequent operation of the lock blocking mechanism, and is primed under pressure vertically from the lever handle to secure the primed lock blocking mechanism, until it is required to be released, and in which the release of both primed mechanisms is via the lever handle, which operates the standard lock mechanism is a representation of the invention the **"Automatic Locking Device"**

To assist in assessment of this application, copies of literature referred to under the heading **"Background and Description of Prior Art"**, is enclosed herewith.

Schedule of Parts Ref Drawings A, B, C and D

1. Lock Side Plate Main Lock (Prior Art) A
2. Cut Out (Side Plate)
3. Locking Bar Top
4. Locking Bar Bottom
5. Lock Plate
6. Lip (Lock Plate)
7. Deadbolt
8. Lever Handle
9. Cylinder
10. Block "Automatic Locking Device" B, C & D
11. Spring (Horizontal)
12. Plunger
13. Intermediate Primer
14. Cut Out (Intermediate Primer)
15. Slide
16. Lip (Slide)
17. Spring (Vertical Upper)
18. Base Plate
19. Sprint (Vertical Lower)
20. Tongue (Base Plate)
21. Axle (Drawing D only)

Drawing Notes:

Reference drawing A/B, A/C and A/D progress the full cycle for each of three version of the "Automatic Locking Device". Referring to a schedule of parts with numbers and descriptions for drawing "A" and common numbers and descriptions for drawings B, C and D. Therefore any conbination of drawings AB, AC or AD can be read in conjunction with the drawing notes for that combination.

Drawing Notes: Reference Drawings A.B. A.D.

Priming Cycle:

Rotate Cylinder (9) Cylinder 9 raises Base Plate (18) Compressing Spring (19) which releases Tongue (20) in Cut Out (2) in the Lock Side Plate (1) and drives Block (10) along Plunger (12). As Block (10) Slides and Compresses Spring (11) Lip (16) on Slide (15) locks into Cut Out (14) in the Intermediate Primer (13) which is now pressed against the underside of Lock Plate (5) thus putting pressure on Springs (17) and (19) which drive Base Plate (18) downward, locking Tongue (20) into Cut Out (2) in Lock Side Plate (1).

The device is now partially primed.

Lever Handle (8) is depressed, raising Lock Plate (5) thus removing pressure on Springs (17) and (19) which allows Base Plate (18) to rise, releasing Tongue (20) from Cut Out (2). Block (10) now slides forward and is held under pressure of Spring (11) against the closest edge of Lock Plate (5).

The device is now fully Primed.

Release Cycle:

Lever Handle (8) is raised lowering Lock Plate (5), Locking Bar Top (3), Locking Bar Bottom (4) and throwing the Deadbolt (7) forward. The lowering of Lock Plate (5) releases the Block (10) to slide across Lip (6) on Lock Plate (5) downward pressure from Lock Plate through Springs (17) and (19) drive Base Plate (18) down driving Tongue (2)

into the secured position of Cut Out (3). Blocking the Lock.

The Lock is now secure.

Drawing Notes: Reference Drawing AC,

Priming Cycle:

Rotate Cylinder (9) Cylinder (9) raises Base Plate (18) compressing Spring (19) releasing Tongue (20) in Cut Out (2) in Lock Side Plate (1) and Driving Block (10) along Plunger (12) compressing Spring (11) Lip (16) on Slide (15) locks into Cut Out (14) in Imtermediate Primer (13) under pressure of Spring (17).

The expansive pressure of Spring (17) is now retaining the expansive pressure of Spring (11).

The device is now partially Primed.

Lever Handle (8) is depressed this raises Lock Plate (5), Locking Bar Top (3) Locking Bar Bottom (4) and also draws in the Deadbolt (7) which depresses the Intermediate Primer (13) releasing Cut Out (14) on Intermediate Primer (13) from Lip (16) on Slide (15) and allowing Spring (11) to expand, driving Block (10) forward against the closest face of the Lock Plate (5) leaving Spring (11) under partial pressure and Spring (19) driving Base Plate (18) down. Thus positioning Tongue (20) in the Blocked position in Cut Out (2) in Lock Side Plate (1).

The Device is now fully primed.

Release Cycle:

Lever Handle (8) is raised lowering Lock Plate (5) Locking Bar Top (3) Locking Bar Bottom (4) and driving Deadbolt (7) forward. The lowering of Lock Plate (5) releases Block (10) over the Lip (6) on Lock Plate (5) Blocking the Lock.

The Lock is now secure.

Claims

1. To resolve the problem of the necessity to use a key to fully secure a multipoint lock the **"Automatic Locking Device"** may be incorporated into any existing multipoint lever operated lock. **The novelty** of the **"Automatic Locking Device"** is that incorporated into any multipoint lever operated lock it will change the mode of operation, enabling the locking points to be both positioned and secured by a single movement of the lever handle, without the use of the key operated cylinder

The inventive step involved in the **"Automatic Locking Device"** is the double priming of the device against both horizontal pressure, which is used to drive the device into the blocking mode and thereby secure the lock, and against vertical pressure, which is used to block the primed device until it is required to function and thus secure the lock.

The combination of these two functions into a single sub-assembly, which can be released by a single movement of the lever handle as it is used to position the locking points, and the subsequent, effective locking of the multipoint lock which results from that single movement, combined with the double priming of the **"Automatic Locking Device"** horizontally via the cylinder, as it is rotated to release the lock mechanism and vertically by the lever handle, as it is used to retract the locking points into the unlocked mode make the **"Automatic Locking Device"** unique in its concept and application.

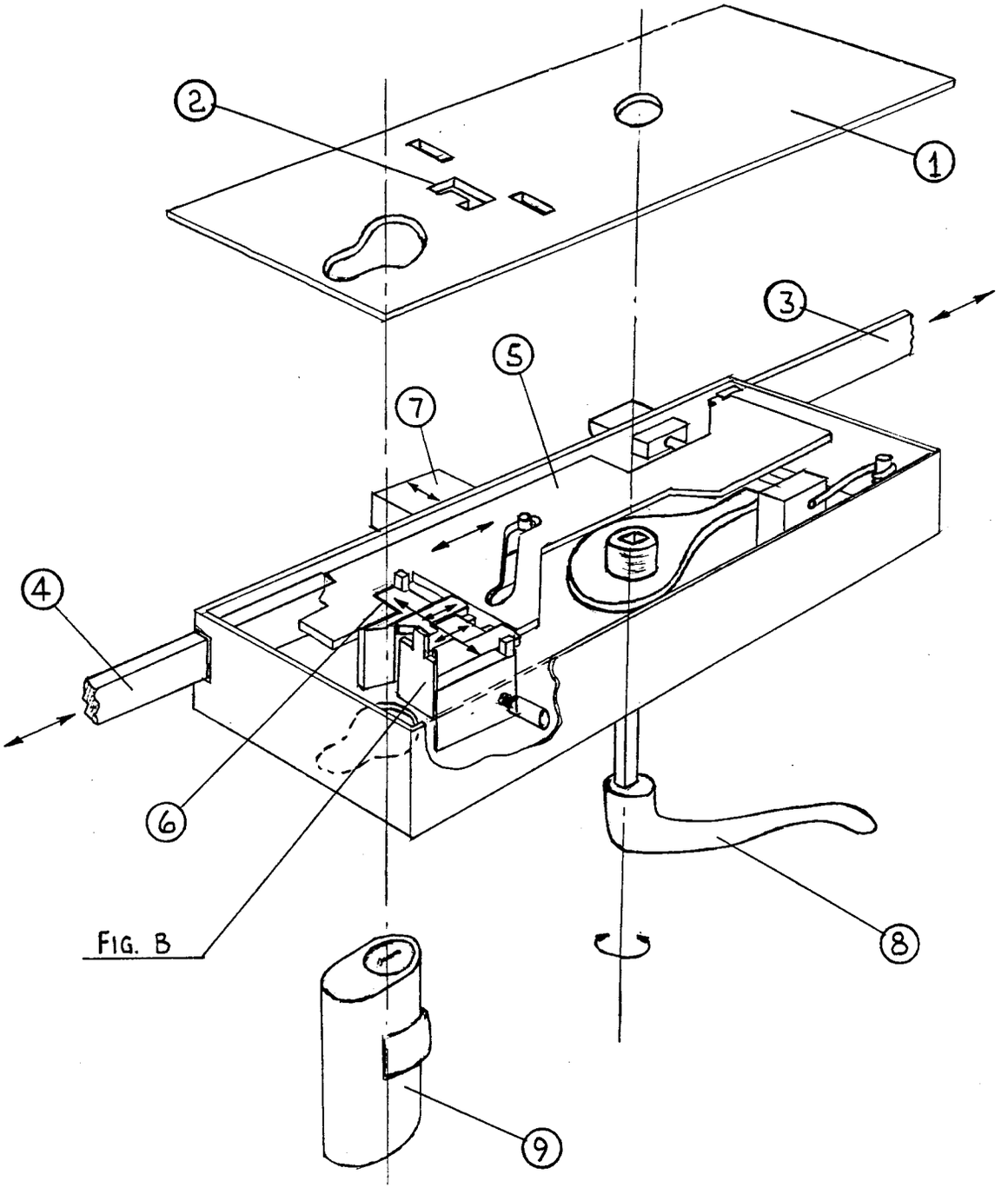

FIG. B

FIG. A

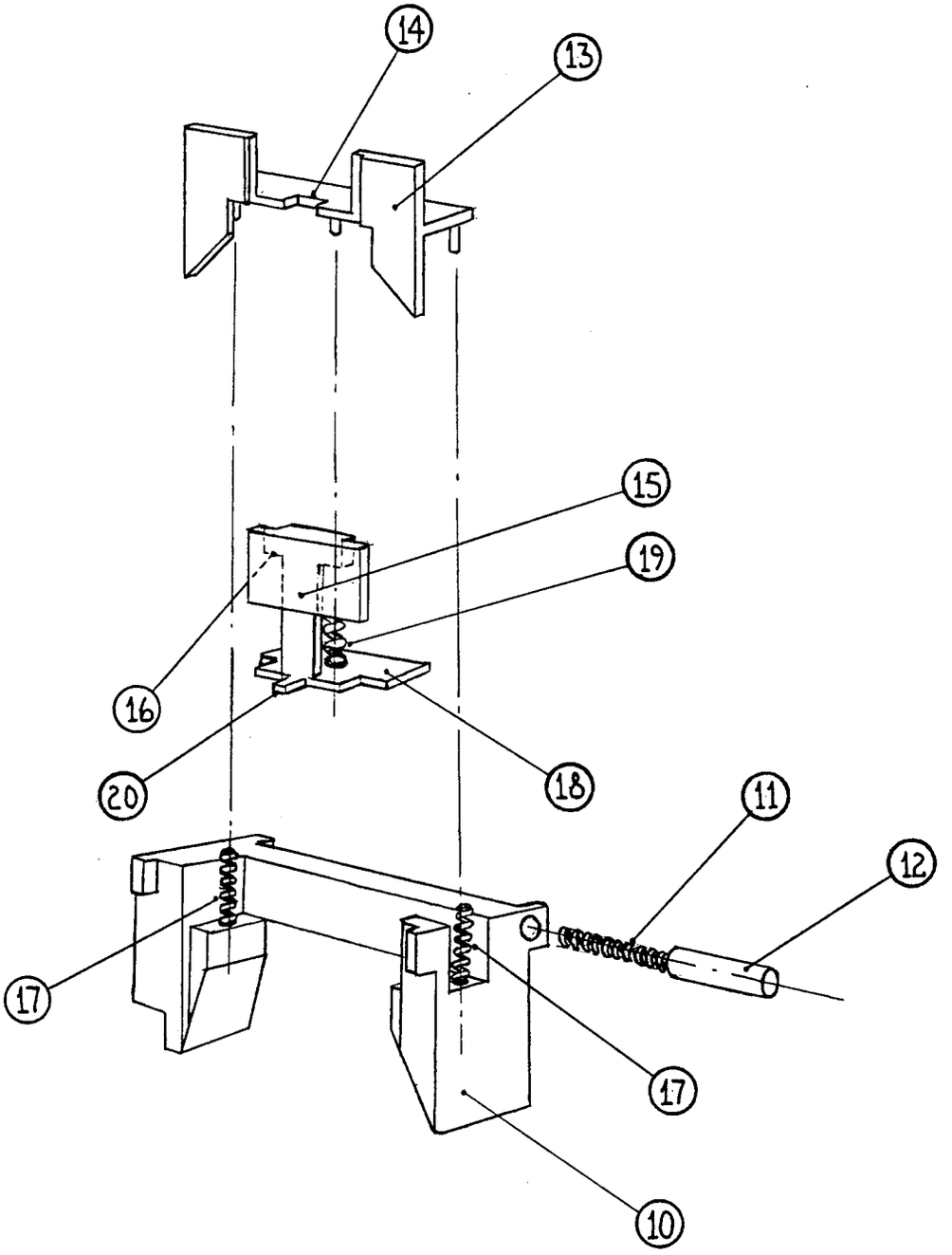

FIG. B

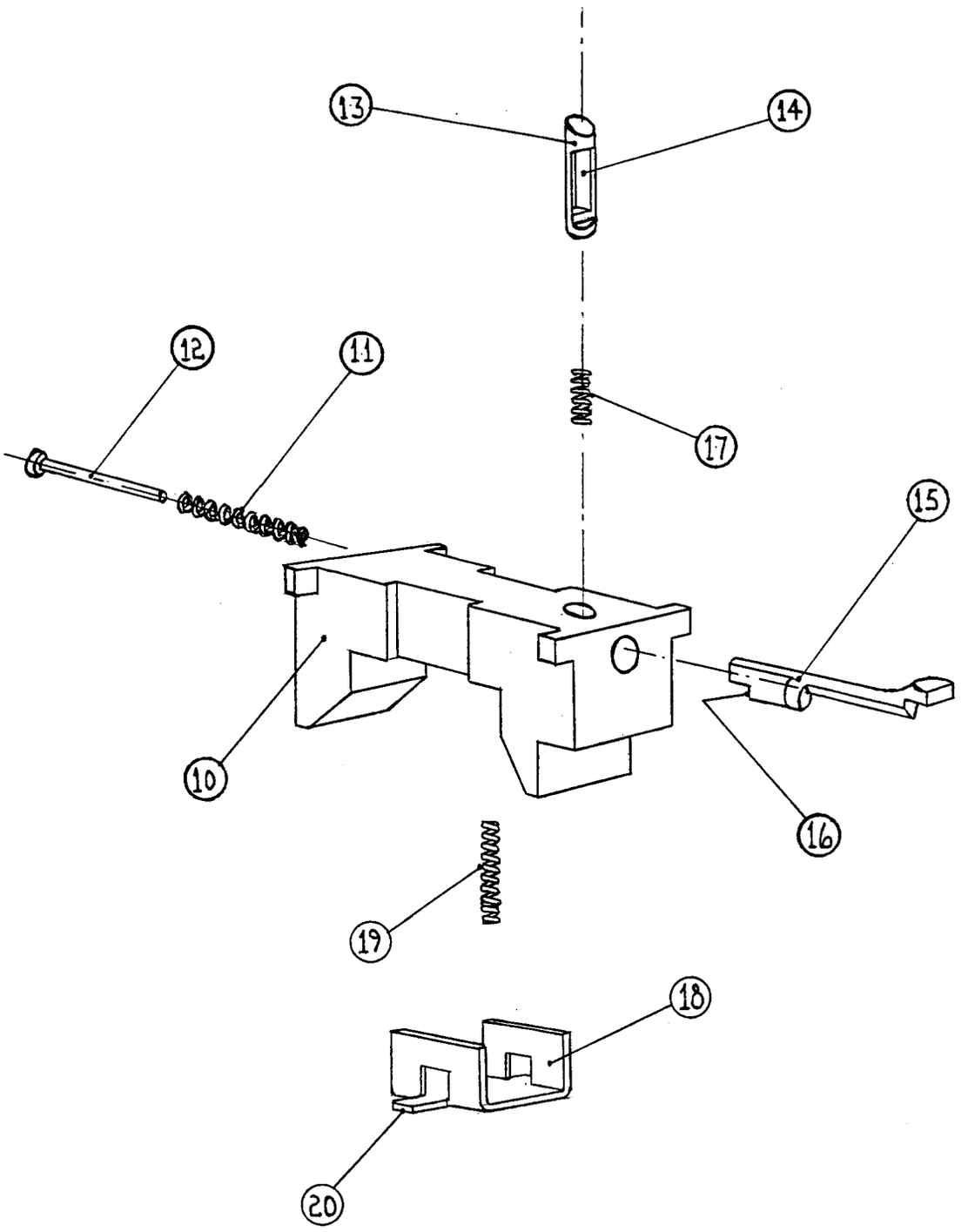

FIG. C

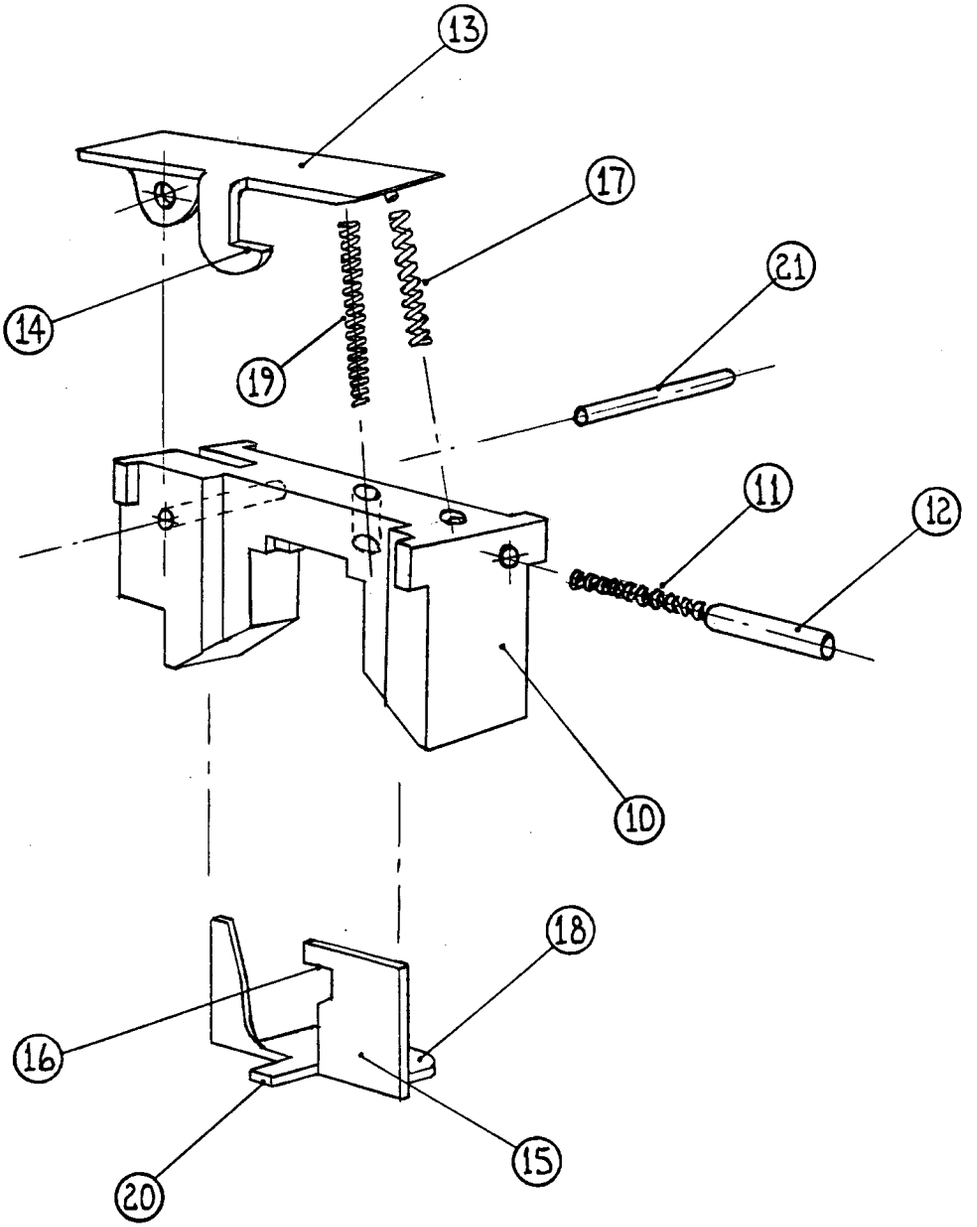

FIG. D

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 10 5224

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.5)
A	EP-A-0 099 292 (ROCHMAN) * abstract * * page 3, line 5 - line 28 * * figures 1-4 *	1	E05C9/02
A	US-A-4 926 664 (GARTNER ET AL.) * abstract * * column 5, line 23 - column 6, line 17 * * figures 1-10 *	1	
A	EP-A-0 021 820 (SCHLEGEL) * abstract * * figures 1,2 *	1	
A	EP-A-0 381 820 (CARL FUHR GMBH &CO) * column 5, line 55 - column 7, line 32 * * figures 1-8 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E05C
E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 NOVEMBER 1991	VESTIN

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 (P0401)