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

(11) **EP 4 023 840 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.07.2022 Bulletin 2022/27

(21) Application number: **21217970.9**

(22) Date of filing: **28.12.2021**

(51) International Patent Classification (IPC):
E05B 13/10 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E05B 13/10; E05B 17/002; E05C 9/021

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **30.12.2020 TR 202022579**

(71) Applicant: **Mesan Kilit Anonim Sirketi**
34570 Istanbul (TR)

(72) Inventors:
- **SERBET, Turgay**
  Istanbul (TR)
- **YASAR, Mahir**
  Istanbul (TR)

(74) Representative: **Sevinç, Erkan**
Istanbul Patent A.S.
Plaza-33, Büyükdere Cad. No: 33/16
Sisli
34381 Istanbul (TR)

(54) HANDLE LOCK ASSEMBLY WITH SEALING FEATURE

(57) The invention relates to a handle lock assembly (100) comprising a main body (20) with an arm connection housing (21); an arm (10) located along a longitudinal axis of the main body (20) and supported at one end; and a lock plug (30) on the arm (10), which is suitable for locking in such a way to limit the movement of the arm (10). Said handle lock assembly (100) comprises at least one arm wheel (15) connected with the arm (10) and movable within the arm connection housing (21) simultaneously with the movement of the arm (10); at least one movement transmission member (17) having teeth (18) thereon and connected with the arm wheel (15) and positioned to convert the rotational movement from the arm wheel (15) to the linear movement; and at least one sealing member (40) positioned within the arm connection housing (21), configured and sized to be in circumferential contact with the inner wall (22) of the arm connection housing (21).

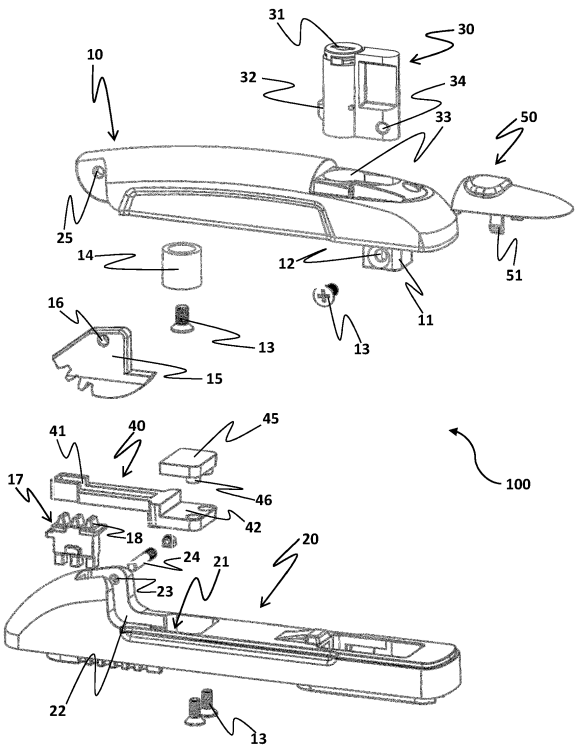

FIGURE 1

EP 4 023 840 A1

Description

Technical Field of the Invention

[0001] The present invention relates to a linear acting handle lock assembly with sealing feature suitable for use in electric boards, cabinets, mailboxes, cargo lockers and the like.

Background of the Invention

[0002] Handle lock assembly structures, which are suitable for linear movement and have an arm that the user can move in the vertical direction, have been used for many years. These locks, which are suitable for use on cabinet covers, are exposed to external factors, especially in the open air, and the working efficiency thereof may decrease as a result of rain, heat, temperature, etc.

[0003] A prior art publication in the technical field of the invention may be referred to as TR 2019/04289, which discloses an arm wheel, which is connected on the main body, along with the arm, from an upper end of an existing arm, and is located in a slot; a sliding plate which is located in said main body in such a way to move up and down, and is associated with the gears on the arm wheel by means of channels made, on its surface in the vertical direction, at certain distances from each other; and a rotary wheel in contact with the internal gears on the sliding plate.

[0004] This type of vertical arm-operated handle lock assemblies cannot exhibit sufficient resistance against sealing. Especially undesirable situations such as wetting and dusting of the gear structure to which the movement is transferred may reduce the working efficiency of the lock. In addition, incompatibilities may occur when different types of lock plugs are required.

Objects of the Invention

[0005] An object of the present invention is to provide a handle lock assembly with sealing feature.

[0006] Another object of the present invention is to provide a modular handle lock assembly that allows the use of different types of lock plugs.

[0007] Another object of the present invention is to provide a durable handle lock assembly that is compatible with heavy outdoor conditions, which may be opened in easy manner.

[0008] Still another object of the present invention is to provide a durable handle lock assembly that meets IP 65, IP 66 sealing specifications.

Summary of the Invention

[0009] The invention relates to a handle lock assembly suitable comprising a main body with an arm connection housing; an arm located along a longitudinal axis of said main body and supported at one end; and a lock plug on the arm, which is suitable for locking in such a way to limit the movement of the arm. Said handle lock assembly comprises at least one arm wheel connected with the arm and movable within the arm connection housing simultaneously with the movement of the arm; at least one movement transmission member having teeth thereon and connected with the arm wheel and positioned to convert the rotational movement from the arm wheel to the linear movement; and at least one sealing member positioned within the arm connection housing, configured and sized to be in circumferential contact with the inner wall of the arm connection housing. Thus, a lock structure is obtained which is impermeable and resistant to external factors.

Brief Description of the Drawings

[0010] The handle lock assembly which is the subject of the present invention is illustrated in the accompanying drawings for better understanding thereof, which drawings are only attached for better explaining the present invention and are not limiting the invention.

Figure 1 is an exploded view of a handle lock assembly according to the present invention.

Figure 2 is a cross-sectional view of the handle lock assembly according to the present invention, with the arm being in the opened position and sectioned along its longitudinal axis.

Figure 3 is a cross-sectional view of the handle lock assembly according to the present invention, with the arm being in the closed position and sectioned along its longitudinal axis.

Figure 4 is a partial perspective view of the handle lock assembly according to the present invention, with the arm being in the closed position and sectioned along its longitudinal axis.

Figure 5a is a top perspective view of the sealing member suitable for use for sealing purposes in the handle lock assembly according to the present invention.

Figure 5b is a bottom perspective view of the sealing member suitable for use for sealing purposes in the handle lock assembly according to the present invention.

Figure 6 is a perspective view of the handle lock assembly according to the present invention, showing the assembly of the latch members.

Figure 7 is a perspective view of the main body of the handle lock assembly according to the present invention, with the arm removed.

Detailed Description of the Invention

[0011] The invention will now be explained in detail in this section with reference to the accompanying drawings and the list of reference numerals used in the appended drawings is as follows;

10. Arm
11. Lock plug assembly protrusion
12. Arm assembly hole
13. Fixing member
14. Support member
15. Arm wheel
16. Arm wheel housing
17. Transmission member
18. Teeth
19. Locking teeth
20. Main body
21. Arm connection housing
22. Inner wall
23. Main body pin housing
24. Arm pin
25. Arm pin housing
30. Lock plug
31. Key hole
32. Lock tongue
33. Lock plug housing
34. Lock plug assembly hole
35. First type connection cavity
36. Second type connection cavity
40. Sealing member
41. First portion
42. Second portion
43. Connection hole
44. Wheel housing
45. Sealing cover
46. Connection protrusion
47. Alignment housing
50. Dust cover
51. Claw
100. Handle lock assembly

[0012] The invention relates to a handle lock assembly (100) suitable for use in cabinet covers. The handle lock assembly (100) comprising a main body (20) with an arm connection housing (21); an arm (10) located along a longitudinal axis of the main body (20) and supported at one end; and a lock plug (30) on the arm (10), which is suitable for locking in such a way to limit the movement of the arm (10). Said handle lock assembly (100) comprises at least one arm wheel (15) connected with the arm (10) and movable within the arm connection housing (21) simultaneously with the movement of the arm (10); at least one movement transmission member (17) having teeth (18) thereon and connected with the arm wheel (15) and positioned to convert the rotational movement from the arm wheel (15) to the linear movement; and at least one sealing member (40) positioned within the arm connection housing (21), configured and sized to be in circumferential contact with the inner wall (22) of the arm connection housing (21). The arm wheel housing (16) on the arm wheel (15) is coupled with the arm pin housing (25) and the arm pin (24) passes therethrough and forms the axis of rotation.

[0013] According to the present invention, the handle lock assembly (100) in the form of a lock structure is arranged to be resistant to external factors. One of the greatest advantages of the invention is that the hollow arm connection housing (21) connecting the arm (10) and the main body (20) is completely closed in order to impart a sealing feature.

[0014] As can be seen in Figs. 5a and 5b, said sealing member (40) comprises a first portion (41) and a second portion (42). In a possible embodiment the sealing member (40) is a single piece and the first portion (41) and the second portion (42) are integral with each other. Said first portion (41) includes a wheel housing (44) extending in the direction of the longitudinal axis of the sealing member (40) and in which the arm wheel (15) can move. Thus, the arm wheel (15) is also securely enclosed. The wheel housing (44) is selected to have a thickness that will allow the arm wheel (15) to move freely. On the other hand, there is at least one connection hole (43) on the second portion (42) to fix the sealing member (40) to the main body (20). As can be seen in Fig. 5a, there are two connection holes (43) on the second portion (42). As can be seen in Fig. 1, there is a sealing cover (45) having at least one connection protrusion (46) to couple with the connection holes (43). In particular, the sealing cover (45) to cover the second portion (45), ensures that the sealing member (40) is securely connected to the main body (20). As can be seen in Fig. 2, there is a fixing member (13) that is to be passed through the connection hole (43) on the second portion (42) and the connection protrusion (46) on the sealing cover (45). In this way, the sealing cover (45), especially the second portion (42) is completely surrounded and the connection is realized through the second portion (42). Preferably, the sealing member (40) is made from a flexible material which bends and returns to its original shape and the sealing member (40) is preferably water resistant. Thus, the arm wheel (15) is especially prevented from getting wet, corroded and losing its function over time. It can be said that the arm wheel (15) acts as a pinion gear. As can be seen in Fig. 5b, the sealing member (40) has an alignment housing (47) that is to be coupled with a protrusion in the arm connection housing (21) of the main body (20), other than the connection holes (43).

[0015] The handle lock assembly (100) comprises an arm pin (24) that allows the arm (10) to be supported on the main body (20) by being passed through at least one main body pin housing (23) in the arm connection housing (21) and through the arm pin housing (25) on the arm. In this way, the arm rotates around the rotation axis that is created where it is supported. As can be seen in Fig. 2, said arm (10) is rotated around the arm pin (24) and raised

in the upward direction.

[0016] Again, as can be seen in Fig. 1, there is a support member (14) provided at said arm (10) and suitable for compression in such a way that it contacts an upper surface of the main body (20) when the handle lock assembly (100) is in the closed position. The support member (14) is made of a cylindrical and flexible material, and it is compressed to exhibit a spring effect when the handle lock assembly (100) is in the closed position. Due to such compression, once the lock tongue (32) is pulled back by the lock plug (30), the support member (14) allows the arm (10) to move away from the main body (20) with the effect of the compression, and provides an easy opening opportunity. Inside the inner wall of the arm (10), there is a connection protrusion to which the support member (14) can be attached. Using a suitable fixing member (13), the support member (14) is attached to the connection protrusion. In a preferred embodiment of the invention, said support member (14) is compressed on the sealing cover (45) when the handle lock assembly (100) is in the closed position.

[0017] The lock plug (30), which is inserted in a lock plug housing (33) on said arm (10), comprises spring-loaded encryption pins arranged in accordance with the key to be inserted therein, like a cylinder lock structure. When the user inserts an appropriate key from the key hole (31) in the lock plug (30), the encryption pins take the appropriate position and allow the key to be turned and the lock tongue (32) to be pulled out of the hole where is inserted, and the arm (10) is lifted up. In order to insert the lock plug (30) into the lock plug housing (33), there is a lock plug assembly protrusion (11) on the inner side of the arm (10), through which the arm assembly hole (12) is located. Said lock plug housing (33) comprises a first type connection cavity (35) and a second type connection cavity (36), in different sizes and shapes, in such a way to allow different types of lock plugs (30) to be inserted thereto. The first type connection cavity (35) is located on the longer lateral inner wall, and the second type connection cavity (36) can be located on another inner wall adjacent to the lateral wall.

[0018] As can be seen in Fig. 1, the lock plug assembly hole (34) on the lock plug (30) is aligned with the lock plug assembly protrusion (11) and is fixed to the arm (10) with a suitable fixing member (13) passed therethrough. In addition, there is a fixing member (13) that allows the lock plug (30) to be held in the arm (10) by being passed through the lock plug assembly hole (34) and the arm assembly hole (12). In this way, every type of lock plug (30) in different types of structures having a lock plug assembly hole (34) thereon is fitted into the arm (10) in a compatible manner. The lower surface of the lock tongue (32) is also curved in a convex manner, and while the arm (10) is being closed, the lock tongue (32) is shifted with this surface and is inserted into the appropriate housing.

[0019] Referring to Fig. 4, the transmission member (17) is a rack gear that will interact with the arm wheel (15). The transmission member (17) includes locking teeth (19) that extend partially outward from the main body (20) and enable the arm lock (10) to perform the locking and unlocking operations. The teeth of the arm wheel (15) and the locking teeth (19) of the transmission member (17) match and provide linear movement of the transmission member (17). The transmission member interacts with the opposite locking member that will be moved by the arm lock (10).

[0020] The handle lock assembly (100) described within the scope of the invention will not only be effective against sealing, but also includes a dust cover (50) surrounding the lock plug (30) so as to be more durable in places where it is exposed to harsh conditions such as dust, dirt and corrosion. The dust cover (50), which has an outer surface to coincide with the outer surface of the arm (10), especially restricts the access to the key hole (31). There are at least two opposing claws (51) to ensure easy installation of the dust cover (50). With these claws, it is easily attached to the arm (10).

[0021] The sealing member (40) may be made of a rubber material. The handle lock assembly (100) presented within the scope of the present invention can be used on cabinets or panel doors. The proposed handle lock assembly (100) is arranged especially suitable for use in box or cabinet covers.

Claims

1. A handle lock assembly (100) comprising:

a main body (20) having an arm connection housing (21);
an arm (10) located along a longitudinal axis of the main body (20) and supported at one end;
a lock plug (30) on the arm (10), which is suitable for locking in such a way to limit the movement of the arm (10), **characterized in that** said handle lock assembly (100) comprises:

at least one arm wheel (15) connected with the arm (10) and movable within the arm connection housing (21) simultaneously with the movement of the arm (10);
at least one movement transmission member (17) having teeth (18) thereon and connected with the arm wheel (15) and positioned to convert the rotational movement from the arm wheel (15) to the linear movement; and
at least one sealing member (40) positioned within the arm connection housing (21), configured and sized to be in circumferential contact with the inner wall (22) of the arm connection housing (21).

2. The handle lock assembly (100) according to claim

1, wherein said sealing member (40) comprises a first portion (41) and a second portion (42).

3. The handle lock assembly (100) according to claim 2, wherein said first portion (41) has a wheel housing (44) extending in the direction of the longitudinal axis of the sealing member (40) and in which the arm wheel (15) can move.

4. The handle lock assembly (100) according to claim 2 or 3, wherein the second portion (42) comprises at least one connection hole (43) to fix the sealing member (40) to the main body (20).

5. The handle lock assembly (100) according to claim 4, wherein the handle lock assembly (100) comprises a sealing cover (45) to be positioned on said second portion (42) and having at least one connection protrusion (46) to couple with the connection hole (43).

6. The handle lock assembly (100) according to claim 5, wherein the handle lock assembly (100) comprises a fixing member (13) that is to be passed through the connection hole (43) on the second portion (42) and into the connection protrusion (46) on the sealing cover (45).

7. The handle lock assembly (100) according to any one of the preceding claims, wherein the handle lock assembly (100) comprises an arm pin (24) that allows the arm (10) to be supported on the main body (20) by being passed through at least one main body pin housing (23) in the arm connection housing (21) and through the arm pin housing (25) on the arm.

8. The handle lock assembly (100) according to any one of the preceding claims, wherein the handle lock assembly (100) comprises a support member (14) provided at said arm (10) and suitable for compression in such a way that the support member (14) contacts an upper surface of the main body (20) when the handle lock assembly (100) is in the closed position.

9. The handle lock assembly (100) according to claim 8, wherein said support member (14) is made of a cylindrical and flexible material.

10. The handle lock assembly (100) according to any one of the preceding claims, wherein the lock plug (30) comprises a lock tongue (32) wherein the lock plug (30) is inserted in a lock plug housing (33) on the arm (10) and wherein the lock tongue (32) is arranged to be pulled by a suitable key, allowing the arm (10) to be released from the main body (20) or locked in the main body (20).

11. The handle lock assembly (100) according to any one of the preceding claims, wherein the transmission member (17) is a rack gear and includes locking teeth (19) that enable the arm lock (10) extending partially outward from the main body (20) to perform the locking and unlocking operations.

12. The handle lock assembly (100) according to any one of the preceding claims, wherein the handle lock assembly (100) comprises a dust cover (50) for surrounding and covering the lock plug (30).

13. The handle lock assembly (100) according to claim 12, wherein the dust cover (50) comprises at least two opposing claws (51) for attaching the dust cover (50).

14. The handle lock assembly (100) according to any one of the preceding claims, wherein the lock plug (30) comprises a lock plug assembly hole (34) on the lock plug (30) to coincide with the arm assembly hole (12) on a lock plug assembly protrusion (11) located on the arm (10).

15. The handle lock assembly (100) according to claim 14, wherein the handle lock assembly (100) comprises a fixing member (13) that allows the lock plug (30) to be held in the arm (10) by being passed through the lock plug assembly hole (34) and the arm assembly hole (12).

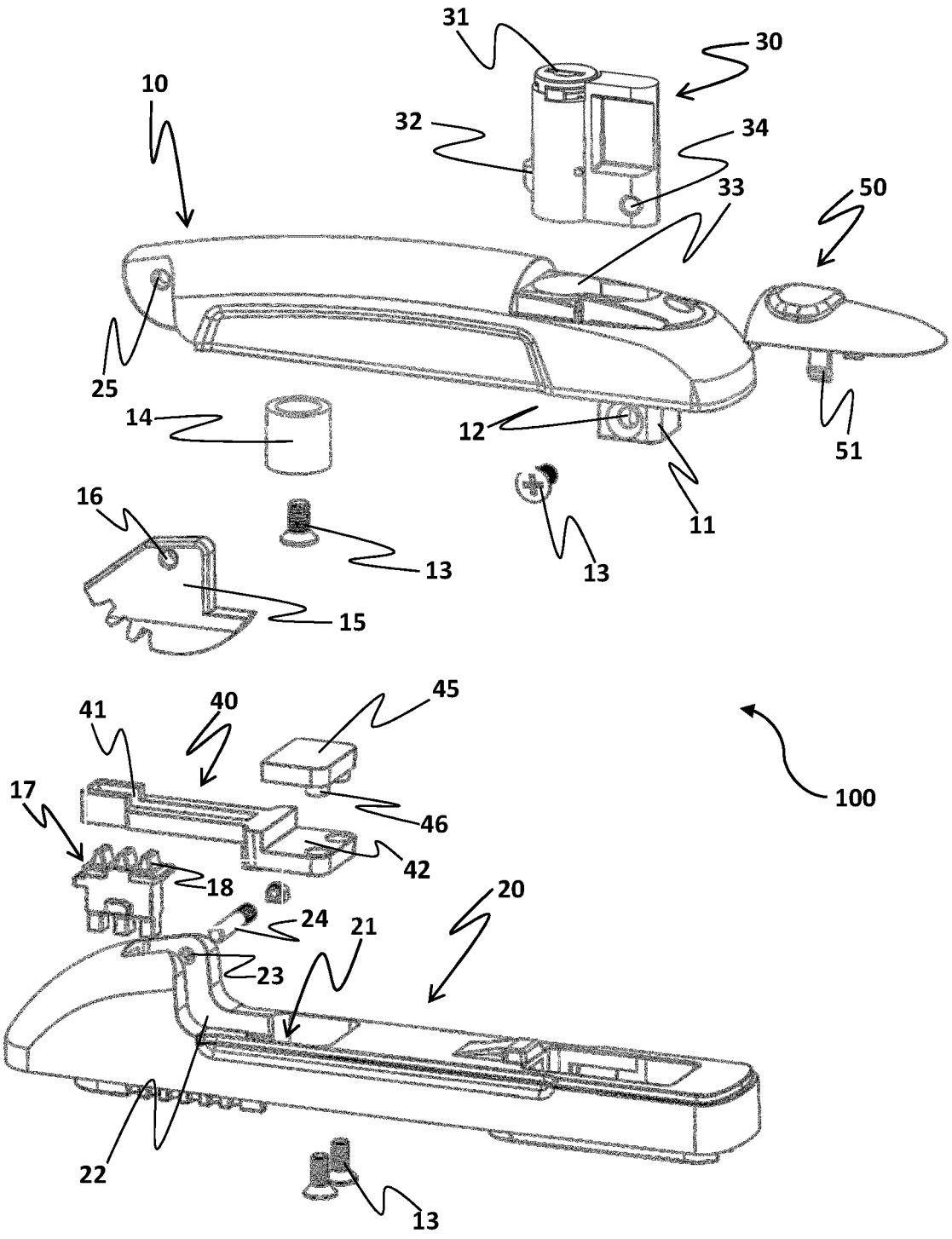
31
30
10
32
34
33
50
25
14
12
51
11
16
13
13
15
41
40
45
100
17
46
42
18
20
24
21
23
22
13

FIGURE 1

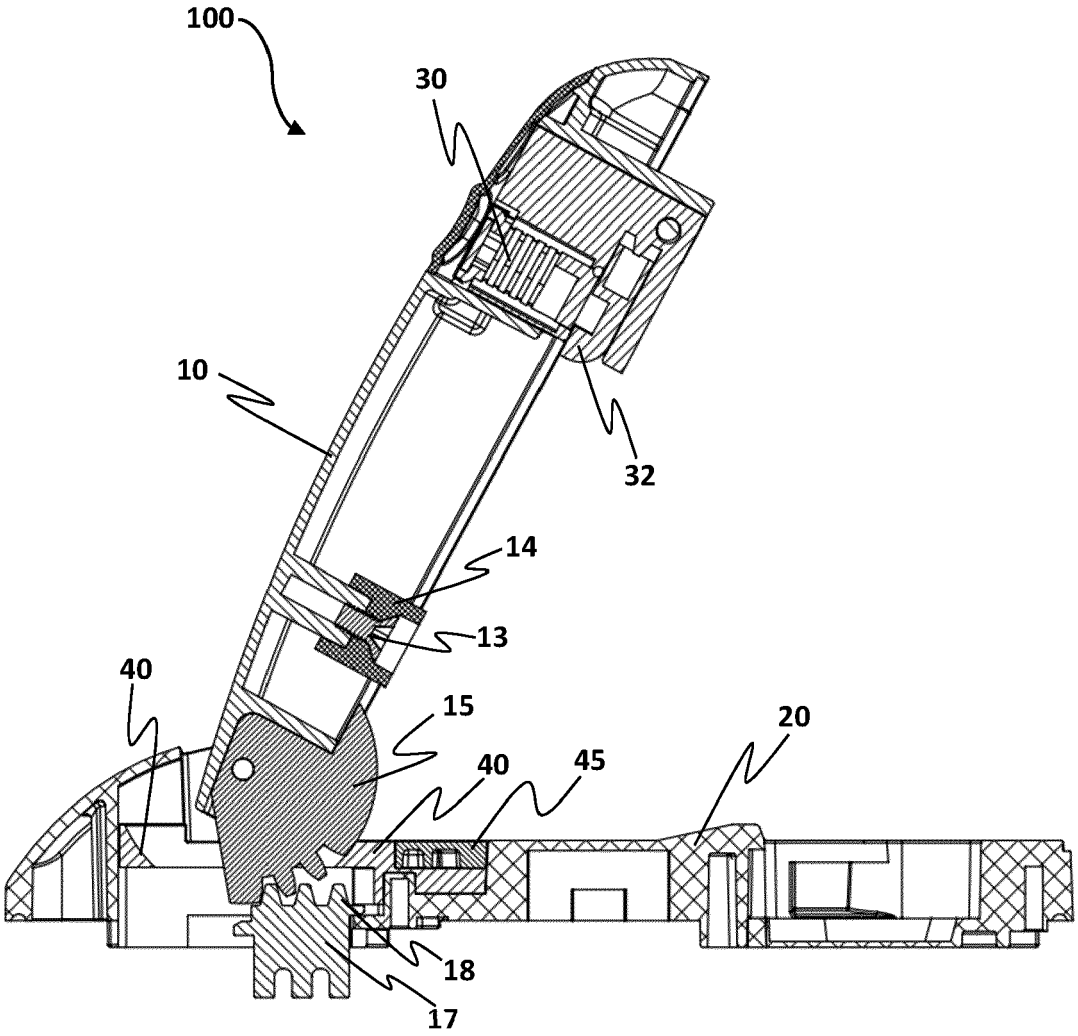

FIGURE 2

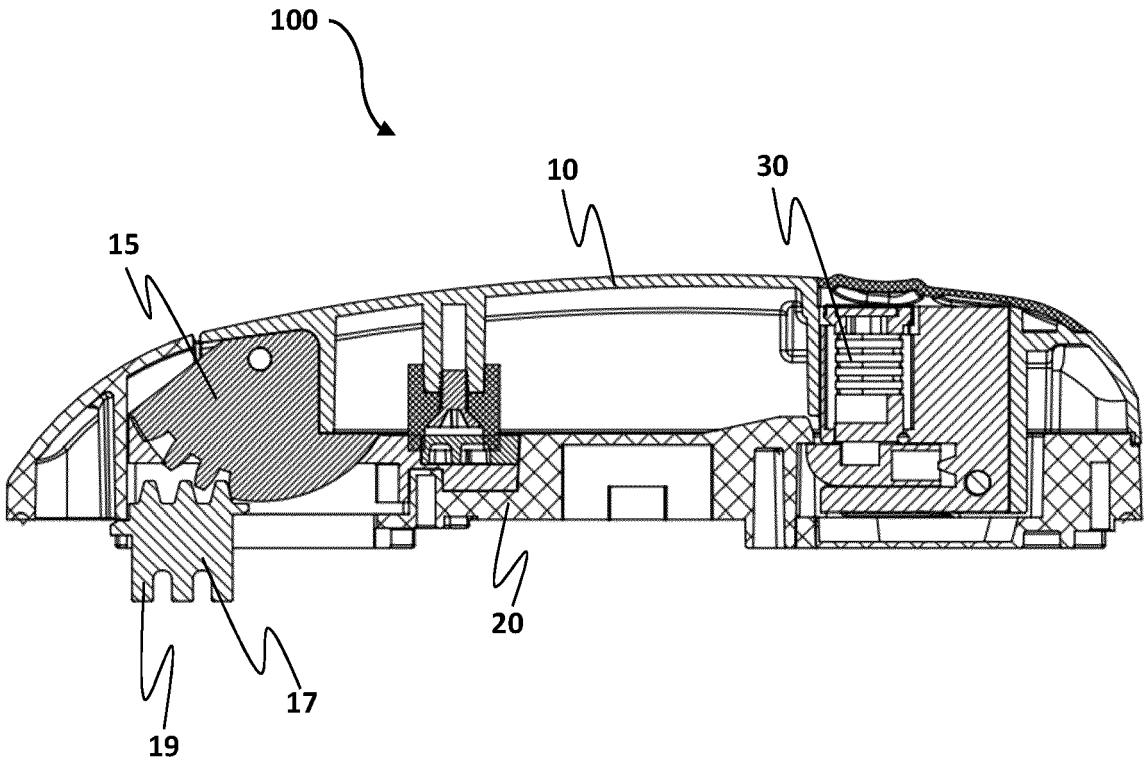

FIGURE 3

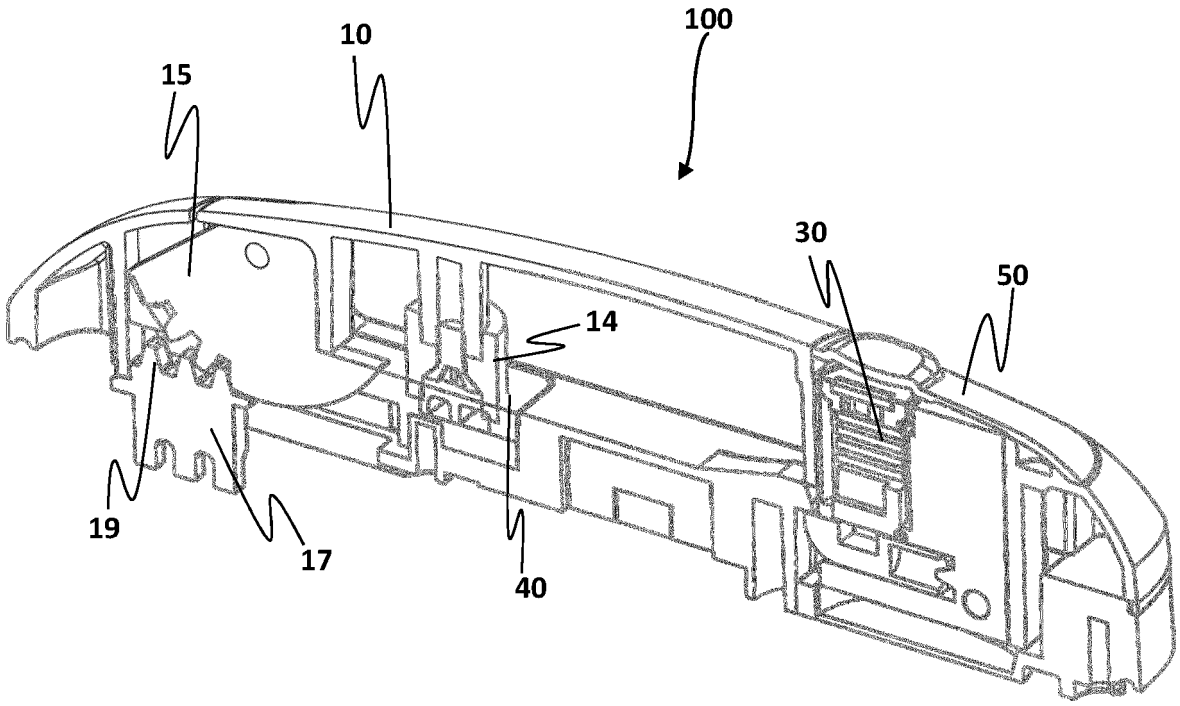

FIGURE 4

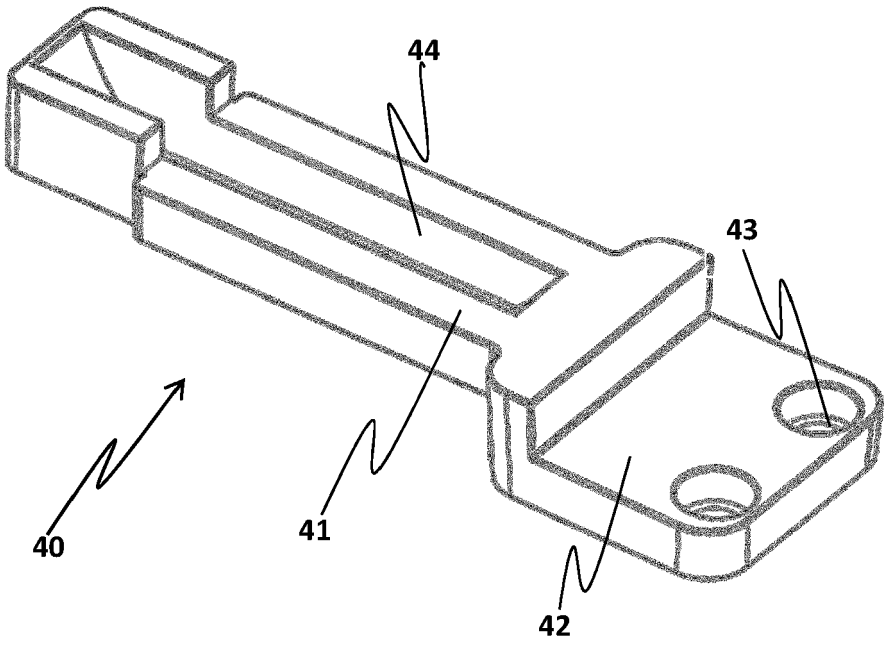

FIGURE 5a

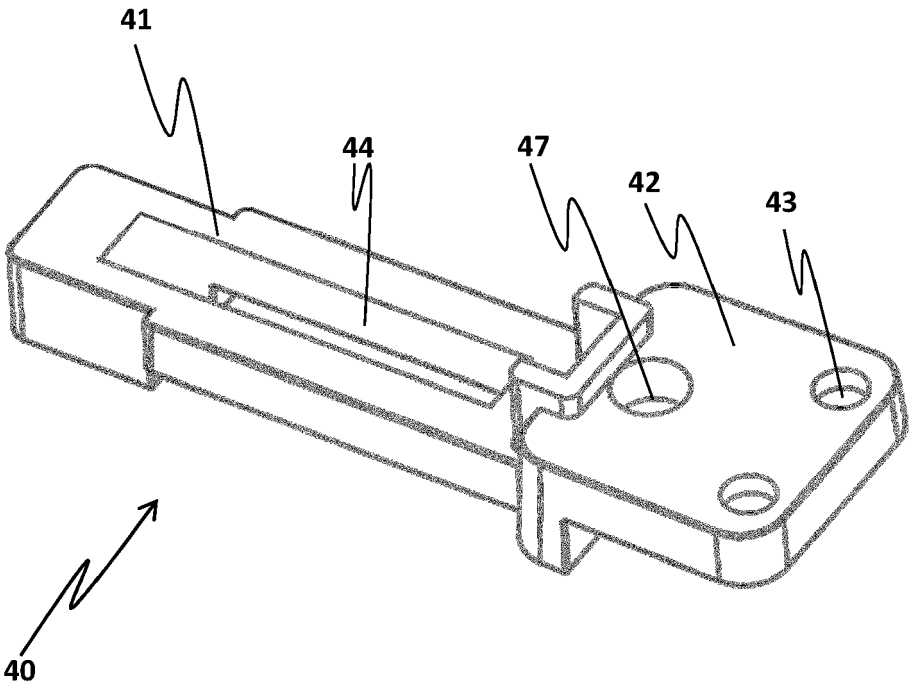

FIGURE 5b

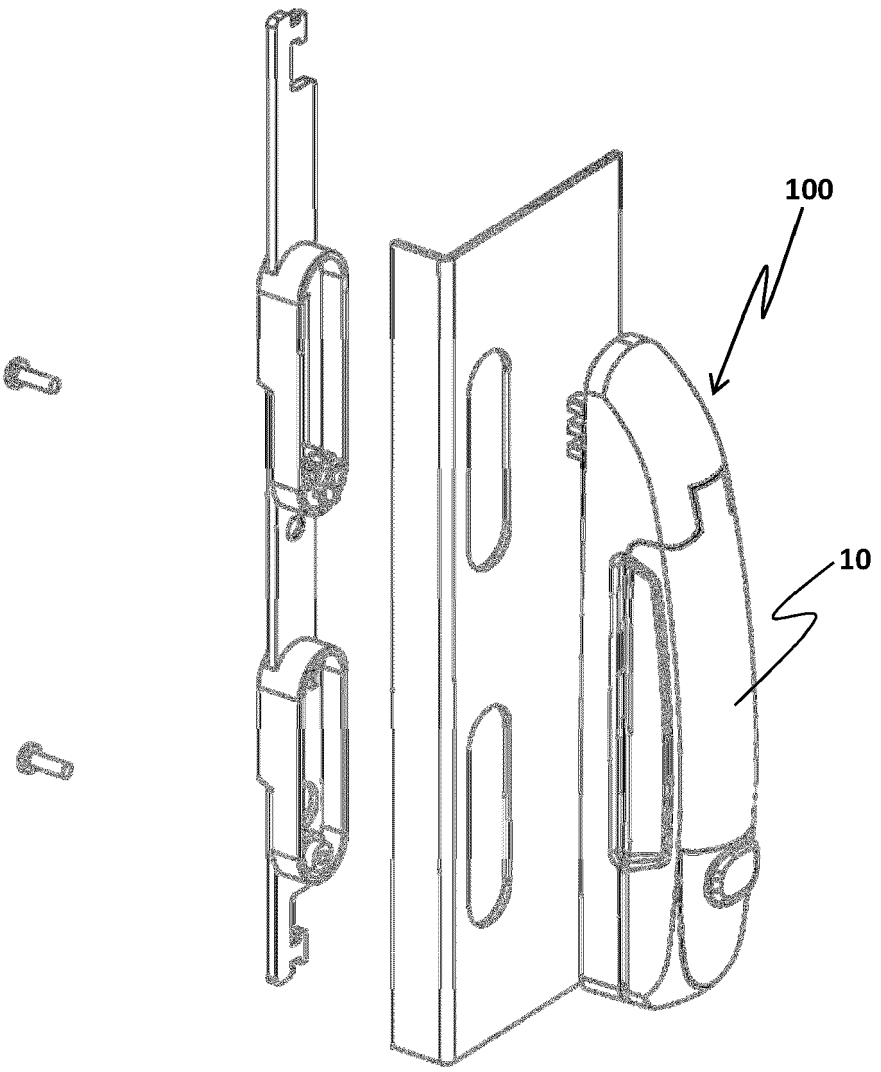

FIGURE 6

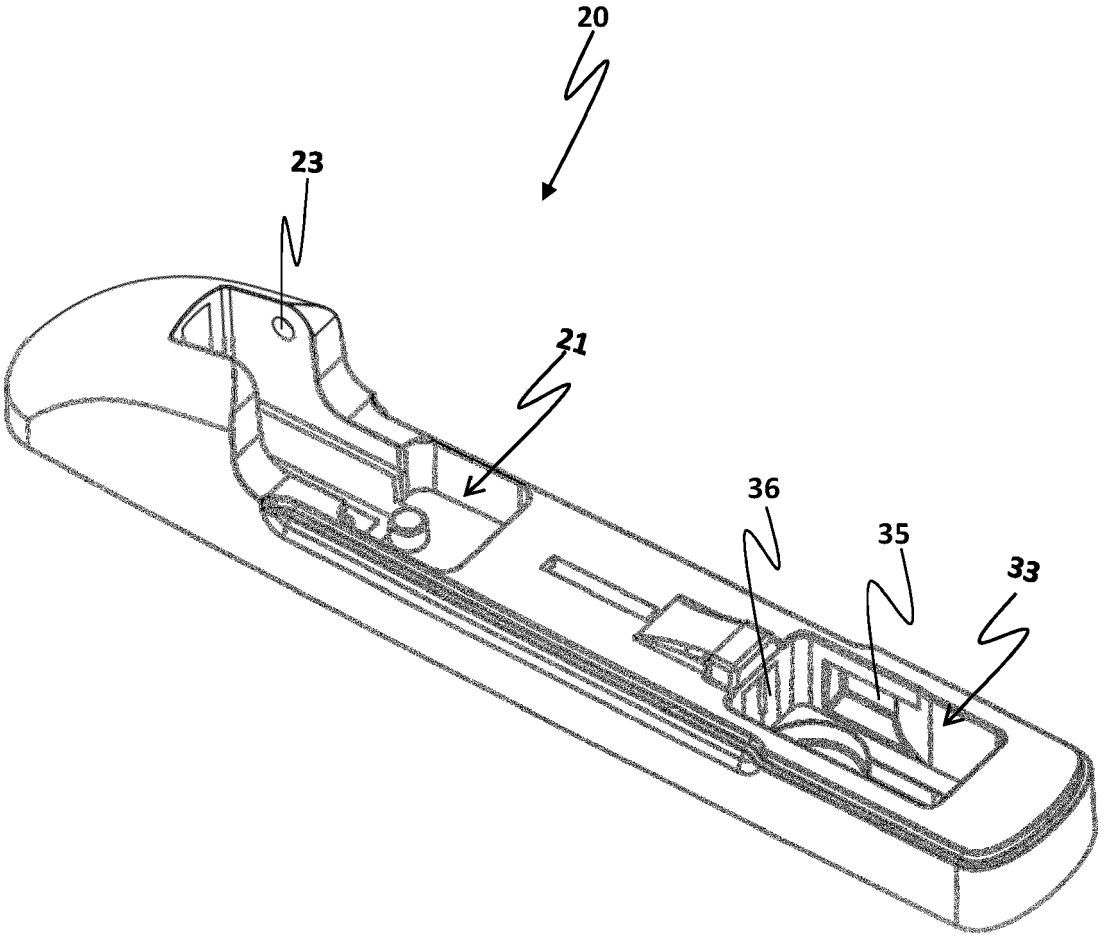

FIGURE 7

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 21 21 7970

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 722 269 A (SIMON PETER [DE] ET AL) 3 March 1998 (1998-03-03) * column 5, line 29 - column 8, line 34; figures 1-13 *	1-15	INV. E05B13/10
A,D	TR 2019 04289 U5 (MESAN KILIT ANONIM SIREKETI) 21 October 2020 (2020-10-21) * the whole document *	1-15	
A	DE 201 07 170 U1 (RAMSAUER DIETER [DE]) 29 August 2002 (2002-08-29) * the whole document *	1-15	
A	CN 103 114 778 A (BEIJING XINLI CREATE ELECTRONIC EQUIPMENT CO LTD) 22 May 2013 (2013-05-22) * the whole document *	1-15	
A	US 5 452 596 A (YAMADA KENICHI [JP]) 26 September 1995 (1995-09-26) * column 3, line 9 - column 7, line 23; figures 3-6 *	1-15	TECHNICAL FIELDS SEARCHED (IPC) E05B E05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 May 2022	Goddar, Claudia

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 21 21 7970

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.

19-05-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5722269 A	03-03-1998	AT 139819 T	15-07-1996
		BR 9307730 A	31-08-1999
		EP 0675994 A1	11-10-1995
		JP 3025306 B2	27-03-2000
		JP H08507839 A	20-08-1996
		US 5722269 A	03-03-1998
		WO 9415050 A1	07-07-1994
TR 201904289 U5	21-10-2020	NONE	
DE 20107170 U1	29-08-2002	NONE	
CN 103114778 A	22-05-2013	NONE	
US 5452596 A	26-09-1995	CN 1093138 A	05-10-1994
		GB 2276195 A	21-09-1994
		HK 1002500 A1	28-08-1998
		JP H06272434 A	27-09-1994
		KR 940021872 A	19-10-1994
		US 5452596 A	26-09-1995

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- TR 201904289 **[0003]**