



(43) International Publication Date  
9 September 2016 (09.09.2016)

- (51) International Patent Classification:  
*G07F 5/02* (2006.01) *G07F 17/10* (2006.01)
- (21) International Application Number:  
PCT/AU2016/050141
- (22) International Filing Date:  
3 March 2016 (03.03.2016)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
2015900734 3 March 2015 (03.03.2015) AU
- (71) Applicant: **FSP HOLDINGS PTY LTD** [AU/AU]; 4  
Hambledon Hill Road, Singleton, New South Wales 2330  
(AU).
- (72) Inventor: **HEWITT, Stephan**; 32 Computer Road, Yatala,  
Queensland 4207 (AU).
- (74) Agent: **FB RICE**; Level 23, 44 Market St, Sydney, New  
South Wales 2000 (AU).
- (81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,  
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,  
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,  
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,  
KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,  
MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,  
PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC,  
SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,  
TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU,  
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,  
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,  
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,  
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, KM, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report (Art. 21(3))

(54) Title: COIN OPERATED DOOR LOCK MECHANISM

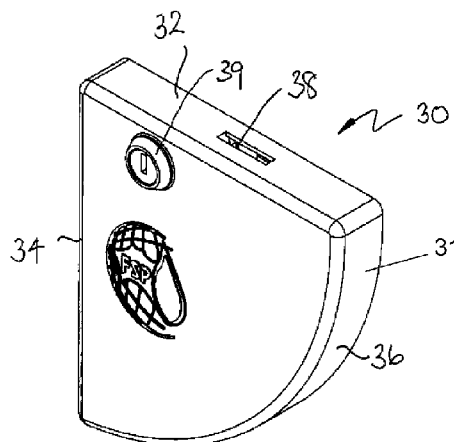


FIG. 6

(57) Abstract: A coin operated lock assembly (30) is provided for attachment to a locker (12), the locker including a cabinet (14) and a door (16). The cabinet defines a locker loop (18) for locking the door using a padlock or the like. The coin operated lock assembly (30) includes a coin operated key lock mechanism including a locking plate (50) which is moved by operation of the key lock, wherein insertion of a coin in the lock allows the door to be locked and the key removed from the lock and wherein the locker is locked by means of a bolt (42) which is fixed to, or movable by, the locking plate (50) and which passes through the locker loop (18) of the locker when the assembly is attached to the locker door.

WO 2016/138564 A1

## **Coin operated door lock mechanism**

### **Cross-Reference to Related Applications**

[0001] The present application claims priority from Australian Provisional Patent Application No 2015900734 filed on 3 March 2015, the content of which is incorporated herein by reference.

### **Background**

[0002] Lockers are commonly used for the temporary safe storage of a person's possessions, such as valuables, school books, clothes and the like. They are common in many environments, particularly in schools, in gyms, and in workplaces where people change from everyday clothes into work uniforms and vice versa. As the name suggests, most lockers include a means for locking the locker, sometimes with an integral key operated lock, sometimes with locks that are card or PIN operated and some simply have a metal loop ("locker loop") for receiving an external padlock. School lockers are commonly locked using external padlocks as the loss of a key is less significant, and also the use of external padlocks is a cheaper solution.

[0003] In some facilities where lockers are provided for temporary use, particularly in public facilities such as swimming pools there is usually a charge for use of a locker. One common way of charging for lockers is by the use of a coin which must be inserted for the locker key to be removed but which is retained when the key is re-inserted to open the locker.

[0004] Such mechanisms can be quite complex, and can add significantly to the cost of the locker.

[0005] Any discussion of documents, acts, materials, devices, articles or the like which has been included in the present specification is not to be taken as an admission that any or all of these matters form part of the prior art base or were common general

knowledge in the field relevant to the present disclosure as it existed before the priority date of each claim of this application.

[0006] Throughout this specification the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated element, integer or step, or group of elements, integers or steps, but not the exclusion of any other element, integer or step, or group of elements, integers or steps.

### **Summary**

[0007] According to the present invention there is provided a coin operated lock assembly for attachment to a locker, the locker including a cabinet and a door, the cabinet defining a locker loop for locking the door using a padlock or the like, wherein the coin operated lock assembly includes a coin operated key lock mechanism including a locking plate which is moved by operation of the key lock, wherein insertion of a coin in the lock allows the door to be locked and the key removed from the lock and wherein the locker is locked by means of a bolt which is fixed to, or movable by, the locking plate and which passes through the locker loop of the locker when the assembly is attached to the locker door.

[0008] Advantageously, the coin operated lock assembly may be attached to existing lockers which are provided with a locker loop for use in locking the locker using padlocks or the like, and may use that locker loop when locking the locker. This allows the cost effective conversion of existing non-coin operated lockers to coin operated lockers, and avoids the need to make significant adjustments to the existing locker to allow for coin operated locking. In this case all that is required in the machining of a hole on the locker door to accommodate components of the assembly. Regardless, it allows the same basic locker design to be used for both types of locker with minimal adjustments.

[0009] Thus in a related aspect there is provided a locker comprising a cabinet and a door, the cabinet defining a locker loop for locking the door using a padlock or the like, the door including a coin operated key lock mechanism including a locking plate which is moved by operation of the key lock, wherein insertion of a coin in the lock allows the door to be locked and the key removed from the lock and wherein the locker is locked by means of a bolt which is fixed to or movable by the locking plate and which through the locker loop.

[0010] The assembly may include a housing defining a slot and pathway for coin inserted into the assembly, and a latch arranged to inhibit movement of the locking plate until the latch has been displaced by a coin inserted into the assembly.

[0011] Stop means may be provided for limiting the movement of the latch until the locking plate has been moved to lock the locker.

[0012] Preferably, the assembly further includes a tab mounted on the locking plate and arranged to cooperate with the latch to temporarily retain the coin, until the lock is unlocked.

### **Brief Description of Drawings**

[0013] A specific embodiment of the invention will now be described, by way of example only, and with reference to the accompanying drawings in which:-

Figure 1 shows a bank of lockers which can be locked using padlocks and locker loops;

Figure 2 shows a front view of a locker incorporating a coin operated lock assembly;

Figure 3 shows a side view of the locker of Figure 2;

Figure 4 shows a section on A-A of Figure 3;

Figure 5 is an enlarged detailed view of area B of Figure 4;

Figure 6 is a perspective view of a lock assembly;

Figure 7 is an inverted rear view of the lock assembly of Figure 6;

Figure 8 is a top plan view of the lock assembly of Figure 6

Figure 9 is a schematic view illustrating a first stage in the operation of the lock assembly;

Figure 10 is a schematic view illustrating a second stage in the operation of the lock assembly;

Figure 11 is a schematic view illustrating a third stage in the operation of the lock assembly; and

Figure 12 is a schematic view illustrating a fourth stage in the operation of the lock assembly.

### **Description of Embodiments**

[0014] Referring to the drawings, Figure 1 shows a bank 10 of lockers 12. Each of the lockers defines an internal compartment/volume 14 which may be closed by a door 16 which is hinged to the wall of the locker. A metal locker loop 18 projects from one side of the front of the compartment on the opposite side to the hinge. The locker loop 18 comprises a metal plate in which a hole 19 is defined. Each door defines a slot 20 through which the locker loop 18 passes when the door is closed. This allows the locker to be locked using a padlock or the like the shackle of which passes through the hole 19 in the locker loop. It can also be seen that the door defines a recess 22 in its front, in which the slot 20 and a handle 24 is located, the recess being in the shape of a quadrant of a circle having two straight perpendicular sides and one curved side.

[0015] Figures 6 to 8 show a coin-operated lock assembly 30 which may be located in the recess 22 in a locker door 16. Figure 2 shows the assembly 30 fixed to the locker door 16. The assembly includes an outer case or housing 31 which is in the shape of a quadrant of a circle having two straight perpendicular sides 32, 34 and one curved side 36. It includes a slot 38 for receiving a coin and a front latch/lock 39 defining a slot for receiving a key. As is best seen in Figure 7, the lock assembly defines a slot 40 which in use fits over an existing locker loop of a locker, such as is shown in Figure 1. Part of a bolt 42 which passes into the slot can also be seen in Figure 7. The door also defines a compartment 44 for holding retained coins. The compartment may be opened to remove the retained coins using a keyed lock 46, which is different to the key for opening the locker itself.

[0016] Figures 9 to 12 illustrate the features and operation of the lock mechanism in more detail. The mechanism includes a generally planar locking plate 50, but which is folded in places to define a number of tabs oriented at 90° to the plane of the plate, which can be moved to the right and to the left by means of a tongue 52 which rotates as the lock/latch 39 is turned and the tongue contacts opposed tabs/stops 54, 56 thus pushing the plate to the left or right.

[0017] Also shown in Figures 9 to 12, opposed side walls 60, 62 which are part of the moulded housing 31 define a chute or vertical pathway into which a coin may drop when inserted into the slot 38. Below one side wall 60 there is a tab 64 which is integral with the plate 50. On the opposite side of the chute there is a curved latch 66 mounted to the plate 50 by a pivot pin 68. Above the latch there is a stop means in the form of a stopper plate 70 which limits the pivoting movement of the latch. Springs 72 are attached to the plate to bias the plate to the right. The latch defines a curved recess 74 which receives an integrally moulded stop 76 which is a part of the housing and prevents the plate from moving. The housing also defines an integrally moulded v-shaped coin stop/guide 77.

[0018] In use, as shown in Figures 9 and 10, a coin 100 is fed in through the slot 38. The coin drops into the lock assembly in the direction of arrow A, until it becomes wedged between the tab 64 and the pivoting latch 66. As shown in Figure 10, the

weight of the coin causes the latch 66 to pivot sufficiently to release the stop 76 from engagement in the recess 74 and allows the lock mechanism to be locked, by allowing the plate to be moved to the left in the direction of the arrow B, shown in Figure 11.

[0019] Figure 11 shows that when the key is turned in the lock the tongue 52 rotates in a clockwise direction and impacts on the tab/stop 56 and causes the plate to move to the left in the direction of the arrow B. The bolt 42 which is attached to the plate moves with the plate and slides through the locker loop 18 (also shown in Figure 5) thus locking the door and preventing the door opening. The movement of the plate to the left allows the latch to pivot further as shown in Figure 11, and the coin drops further in the mechanism but is prevented from dropping by the v-shaped coin stop/guide 77.

[0020] To unlock the door the operator turns the key to move the tongue in an anti-clockwise direction which moves the tongue 52 to the right in the direction of the arrow C, as shown in Figure 12. The tab 64 pushes the coin to the right and as the plate 50 and coin move the coin clears the v-shaped coin stop/guide 77 and drops into the coin store 44 which is located below the latching mechanism.

[0021] The stopper plate 70 guides the latch back to its start position.

[0022] The mechanism as described suits an Australian one dollar coin but it will be appreciated that the position of the stop 64 could be adjusted to allow the mechanism to be used with coins of different sizes for use in other jurisdictions.

[0023] Although the locker loop as shown in the drawings and as described above is a metal plate defining a hole for receiving a padlock, it will be appreciated that other designs of locker loop are possible such as a ring, or U-shaped element, for example.

[0024] It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the above-described embodiments, without departing from the broad general scope of the present disclosure. The present

embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

## CLAIMS:

1. A coin operated lock assembly for attachment to a locker, the locker including a cabinet and a door, the cabinet defining a locker loop for locking the door using a padlock or the like, wherein the coin operated lock assembly includes a coin operated key lock mechanism including a locking plate which is moved by operation of the key lock, wherein insertion of a coin in the lock allows the door to be locked and the key removed from the lock and wherein the locker is locked by means of a bolt which is fixed to, or movable by, the locking plate and which passes through the locker loop of the locker when the assembly is attached to the locker door.
2. A coin operated lock assembly as claimed in claim 1 including a housing defining a slot and pathway for coin inserted into the assembly, and a latch arranged to inhibit movement of the locking plate until the latch has been displaced by a coin inserted into the assembly.
3. A coin operated lock assembly as claimed in claim 2 further including a stop means for limiting the movement of the latch until the locking plate has been moved to lock the locker.
4. A coin operated lock assembly as claimed in claim 3 further including a tab mounted on the locking plate and arranged to cooperate with the latch to temporarily retain the coin, until the lock is unlocked.
5. A coin operated lock assembly as claimed in any preceding claim wherein the locker loop comprises a metal plate defining an aperture capable of receiving a shackle of a padlock.
6. A locker comprising a cabinet and a door, the cabinet defining a locker loop for locking the door using a padlock or the like, the door including a coin operated key lock mechanism including a locking plate which is moved by operation of the key lock, wherein insertion of a coin in the lock allows the door to be locked and the key

removed from the lock and wherein the locker is locked by means of a bolt which is fixed to or movable by the locking plate and which passes through the locker loop.

7. A locker as claimed in claim 5 including a housing defining a slot and pathway for coin inserted into the assembly, and a latch arranged to inhibit movement of the locking plate until the latch has been displaced by a coin inserted into the assembly.

8. A locker as claimed in claim 6 further including a stop means for limiting the movement of the latch until the locking plate has been moved to lock the locker.

9. A locker as claimed in claim 7 further including a tab mounted on the locking plate and arranged to cooperate with the latch to temporarily retain the coin, until the lock is unlocked.

10. A locker as claimed in any one of claims 6 to 10 wherein the locker loop comprises a metal plate defining an aperture capable of receiving a shackle of a padlock.

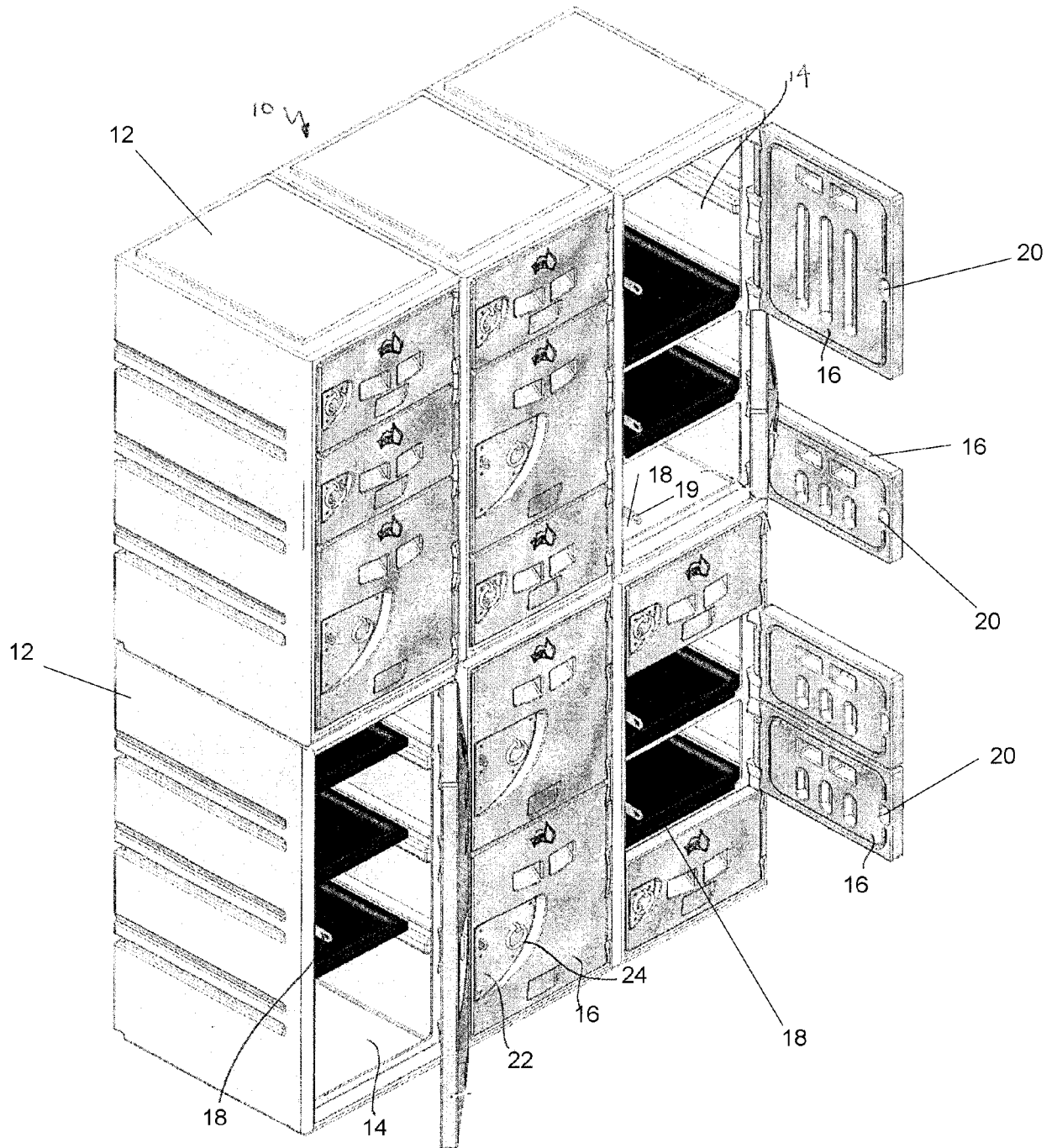


FIG. 1

2/7

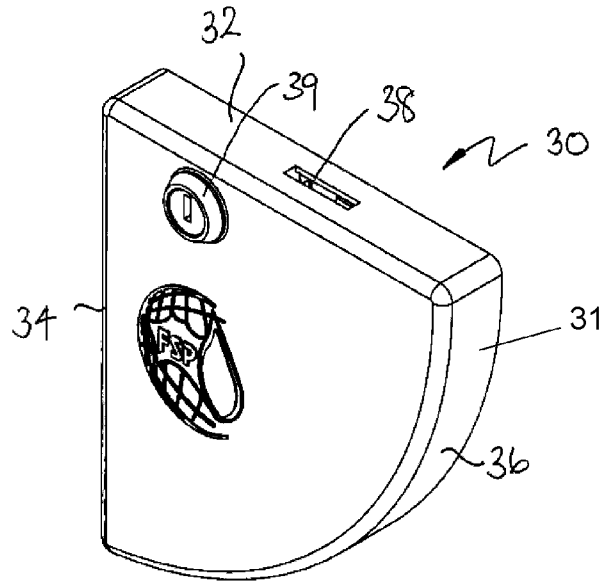


FIG. 6

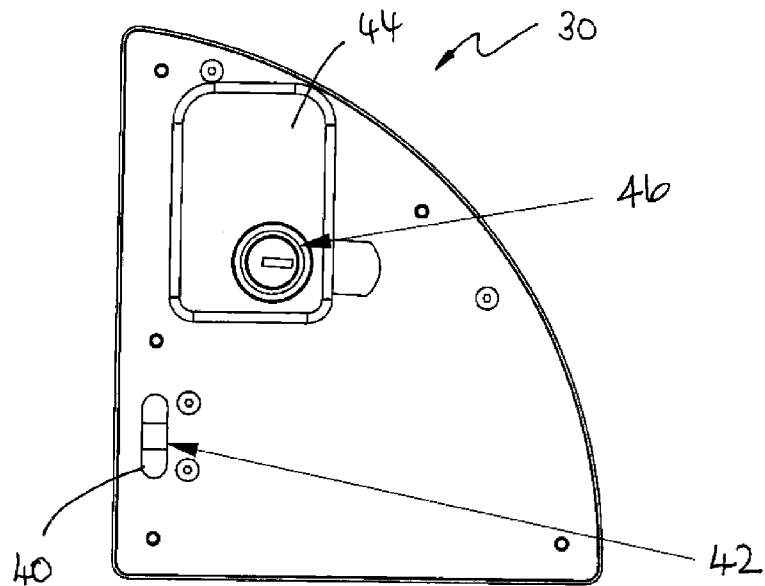


FIG. 7

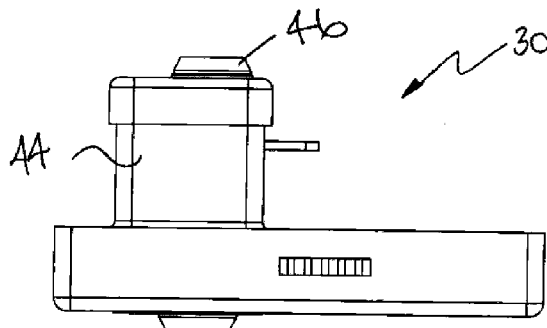


FIG. 8

3/7

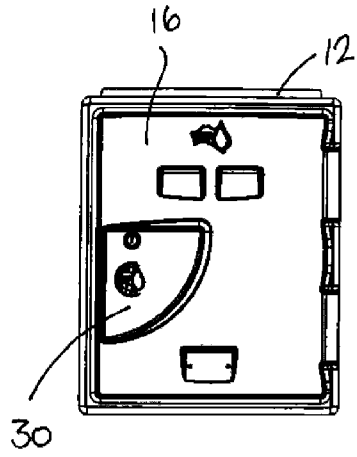


FIG. 2

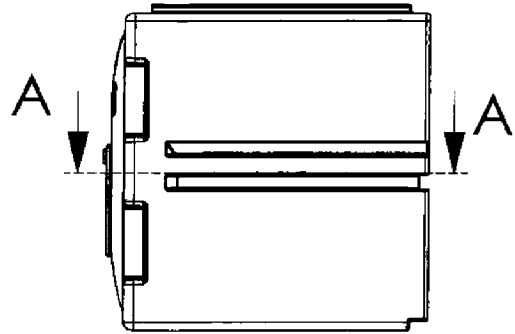


FIG. 3

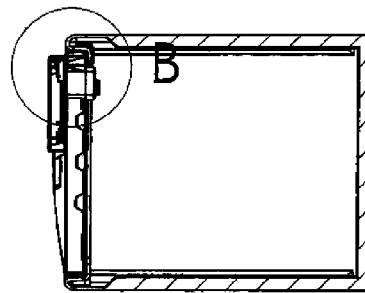


FIG. 4

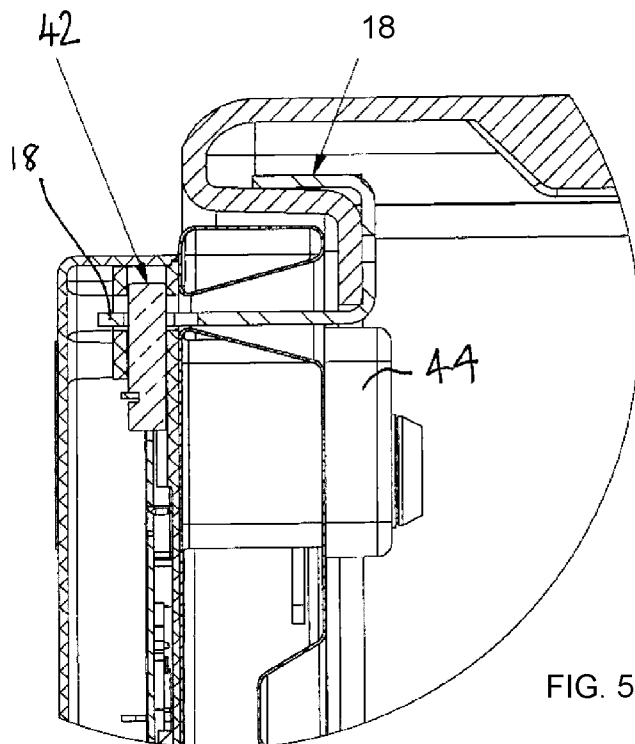


FIG. 5

4/7

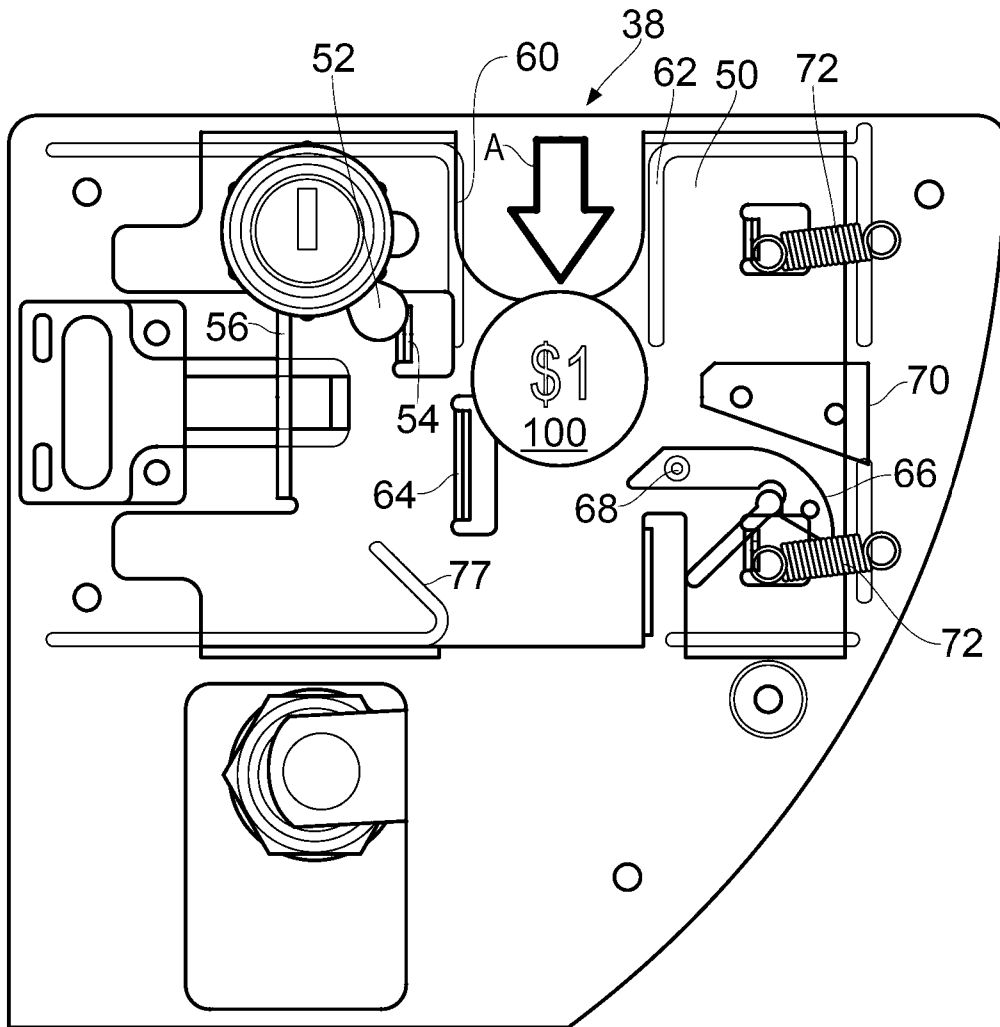


FIG. 9

5/7

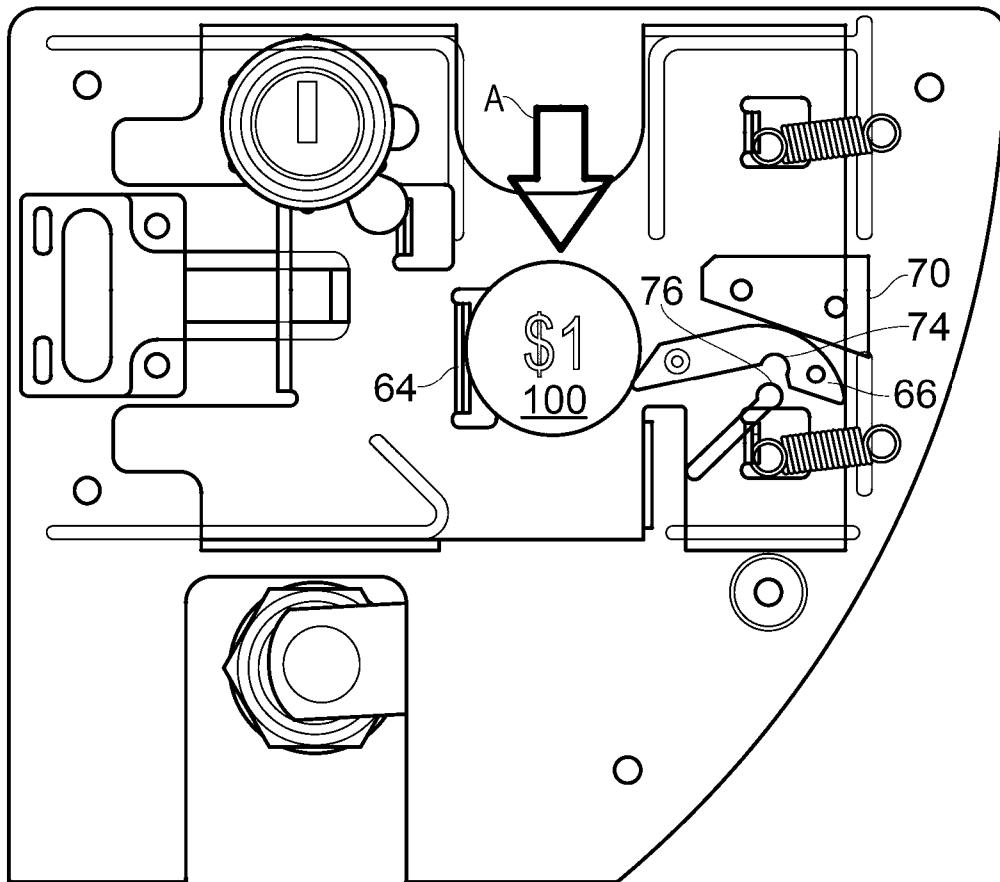


FIG. 10

6/7

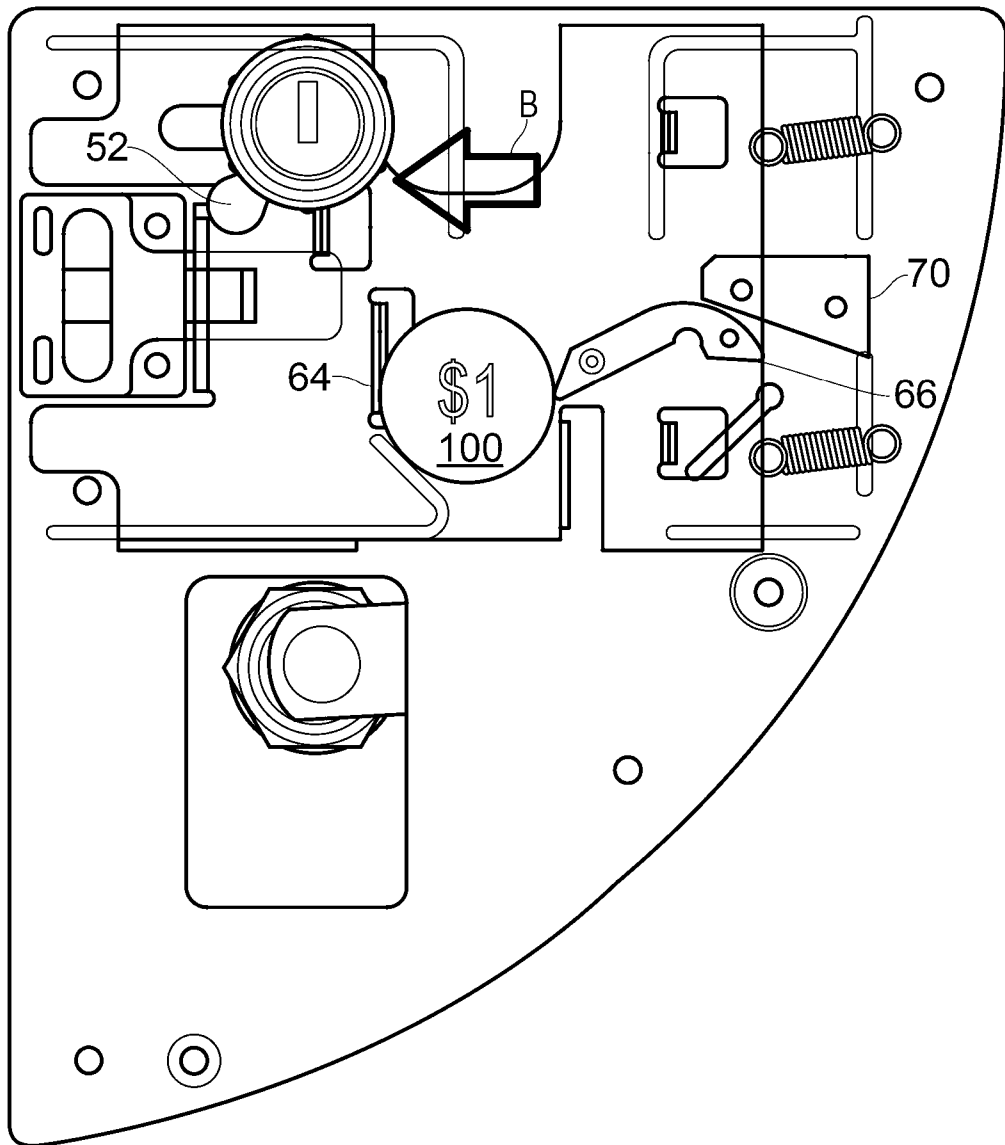


FIG. 11

7/7

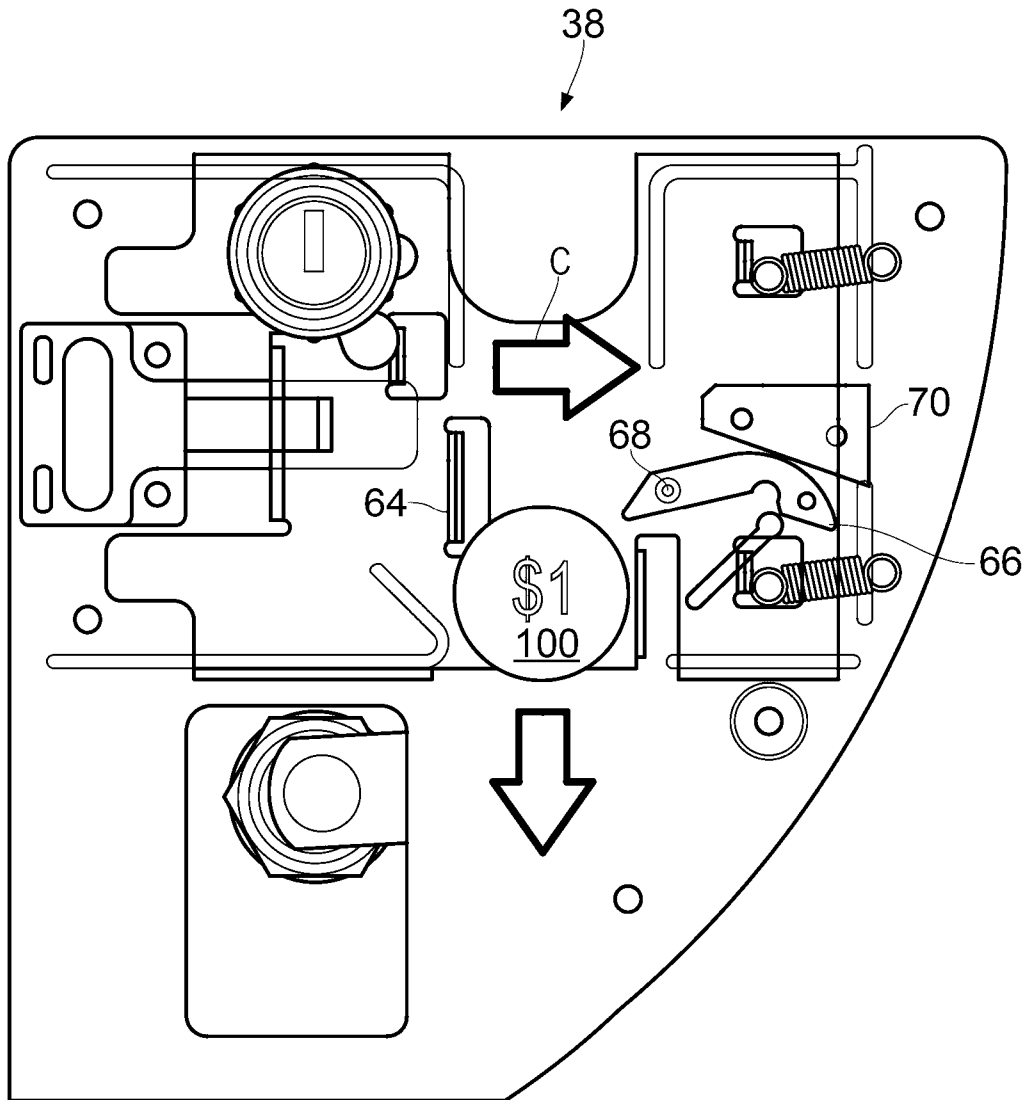


FIG. 12

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2016/050141

## A. CLASSIFICATION OF SUBJECT MATTER

G07F 5/02 (2006.01) G07F 17/10 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPIAP, TXTE: keywords: A47B, G07F, locker, compartment, closet, storage, cabinet, vending machine, safe, locked, coin, token, operate, engage, release, fasten, loop, staple, hasp, padlock, shackle, pin, bolt, double, twin, key, plate, retrofit, replace and like keywords

Google Patents: coin, operated, door, lock, assembly, attached, loop, bolt, padlock, double, electromechanical, solenoid, motor, key and like keywords

AusPat, AU internal databases provided by IP Australia: Applicant / Inventor search

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Documents are listed in the continuation of Box C		

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 29 April 2016	Date of mailing of the international search report 29 April 2016
<b>Name and mailing address of the ISA/AU</b>  AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	<b>Authorised officer</b>  Lili Eng AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. (02) 6283 2166

**INTERNATIONAL SEARCH REPORT**

International application No.

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

**PCT/AU2016/050141**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/0071794 A1 (LU) 19 March 2009 abstract, paragraphs [0025-0028, 0034-0036], figures [7-9]	1-10
A	US 2014/0316918 A1 (BEST LOCKERS, LLC) 23 October 2014 Whole document, in particular: abstract, figure [1], paragraphs [0004-0006]	
A	US 8434838 B2 (ZABBATINO) 07 May 2013 Whole document, in particular: abstract, figures [1-4], col 1 ln 60 to col 2 ln 21	

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/AU2016/050141**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

<b>Patent Document/s Cited in Search Report</b>		<b>Patent Family Member/s</b>	
<b>Publication Number</b>	<b>Publication Date</b>	<b>Publication Number</b>	<b>Publication Date</b>
US 2009/0071794 A1	19 March 2009	US 2009071794 A1	19 Mar 2009
		US 7552809 B2	30 Jun 2009
US 2014/0316918 A1	23 October 2014	US 2014316918 A1	23 Oct 2014
		US 2015102711 A1	16 Apr 2015
US 8434838 B2	07 May 2013	US 2012206029 A1	16 Aug 2012
		US 8434838 B2	07 May 2013
		US 2012209763 A1	16 Aug 2012
		US 8496308 B2	30 Jul 2013

**End of Annex**