

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 October 2007 (11.10.2007)

PCT

(10) International Publication Number
WO 2007/113263 A1

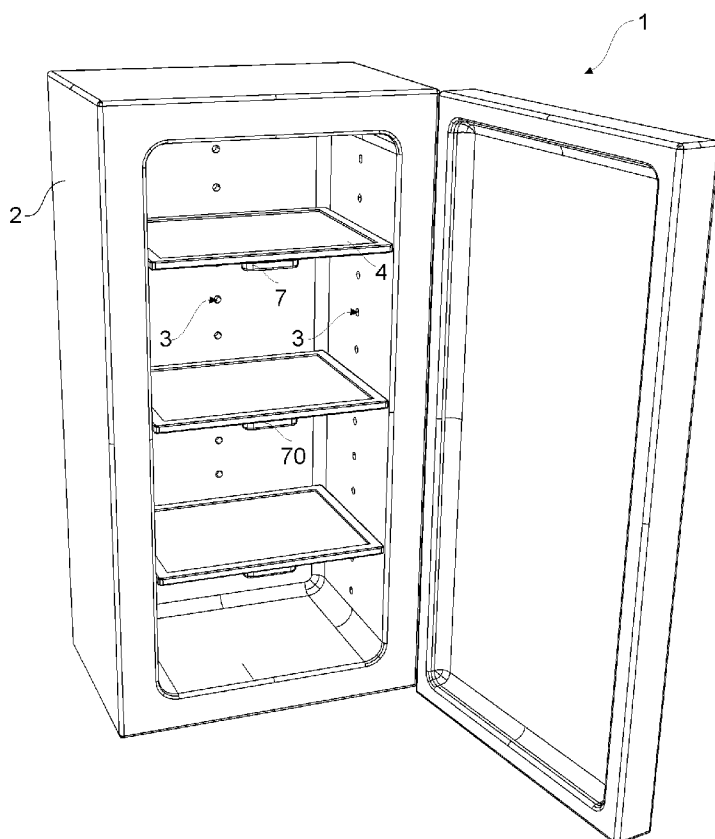
- (51) International Patent Classification:
F25D 25/02 (2006.01) *F25D 25/04* (2006.01)
- (21) International Application Number:
PCT/EP2007/053120
- (22) International Filing Date: 30 March 2007 (30.03.2007)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
TR2006/01554 31 March 2006 (31.03.2006) TR
- (71) Applicant (for all designated States except US): **ARCELIK ANONIM SIRKETI** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **OZYUKSEL, Emre** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **CELIK, Ridvan, Kadir** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **ERTURK, Nihan** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **DEVELI, Esra** [TR/TR]; E5 Ankara Asfalti Uzeri,

Tuzla, 34950 Istanbul (TR). **VARDAR, Osman** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **KOSE, Cihan** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,

[Continued on next page]

(54) Title: A COOLING DEVICE



(57) Abstract: The present invention relates to a cooling device (1) comprising a height adjustable shelf (4). The pins (6) situated on different sides of the shelf (4) utilized in the said cooling device (1), can be controlled from one place. To this end, the adjustment mechanism (7, 70) comprises a guide (9, 90) that provides the direction and course of the force applied by the user on the handle (8, 80) to be changed towards the pins (6) situated on the different sides of the shelf (4) and a force activator (11, 110) that conveys the force to the pins (6) by moving in the said guide (9, 90).



PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

Description

A COOLING DEVICE

[0001] The present invention relates to a cooling device comprising a height adjustable shelf.

[0002] In cooling devices like the refrigerator, freezer etc. the foodstuff and various containers are stored on the shelves. The distance between the two shelves should be changeable, in other words, the height of the shelf within the body should be adjustable depending on the needs of the user.

[0003] In some of the cooling devices, numerous grooves and rails are formed on two opposite walls of the body in order to adjust the height of the shelf. The user changes the height by displacing the shelf from the grooves in a level and locating in another pair of grooves at the desired level. However, the user first has to pull the shelf out of the body and after adjusting the height push it back in for this process. Particularly in cooling devices wherein the door cannot be opened entirely, this process presents problems for the user.

[0004] In the state of the art, furthermore, applications wherein there are holes within the body and pins on the shelf that are fitted into these holes are known.

[0005] Such an application is explained in the United States of America patent no. US4603782. In this application, the shelf comprises support tabs that fit into the holes on the four vertical uprights. Two of the support tabs have a movable configuration, pushed by a spring and freed from the holes by pulling back with an actuator button. A separate button is used to control each movable support tab.

[0006] In the implementation explained in United States of America patent no. US471481, the shelf comprises two suitably formed pins in the semicircular groove on one of its sides and springs that push these pins into the holes in the body. A button fixed to the pins allows the pins to be pulled into the grooves when required and adjust the height of the shelf. Since the two buttons are arranged close to each other, it is possible to control both by one hand.

[0007] In the United States of America patent no. US1778075, a U shaped arm is mentioned. The two terminals of the bail that are pushed by a spring, project out of the shelf towards the slots in the body. When pulled, both terminals of the bail are dislodged from the slots.

[0008] The refrigerator explained in the Great Britain patent no. GB751350 comprises circular shelves mounted on a vertical shaft. The pin that provides the shelf to be

mounted on the shaft is controlled by a manual lever.

[0009] In the Swiss patent no. CH404117, a pin that is pushed out of the shelf by a spring and an arm that is used to pull this pin into the shelf can be observed.

[0010] The objective of the present invention is to design a cooling device comprising shelves whose heights can be easily adjusted.

[0011] The cooling device designed to fulfill the objectives of the present invention is explicated in the attached claims. The pins situated on different edges of the shelf utilized in the said cooling device can be controlled from one place. Therefore, the adjustment mechanism comprises a guide that changes the course and the direction of the push-pull force applied on the handle by the user towards the pins situated on the opposite sides of the shelf, moving in respectively opposite directions and a activator that transmits the force to the pins by sliding on this guide. When the user pulls the handle towards the front of the body, the pins that are inserted in the holes of the two side walls of the body are dislodged and thus the shelf can be moved upwards-downwards within the body.

[0012] In an embodiment of the present invention, the guide is shaped like at least two pulleys. The activator is a cord with one end attached to the handle and the other to the pin. The activator that extends along and parallel to the side wall of the body between the handle and the pulley makes a turn of almost 90° on the pulley and starts to extend perpendicular to the side wall. The bendable structure of the cord allows for this turn. Consequently, the movement direction of the handle can be changed by 90° and transferred to the pins. When the handle is pulled, the cords that slide on the pulley pull the pins tied to its other end and dislodge them from the holes in the body. Accordingly, the shelf is freed to be moved within the body and the height can be changed. The springs that are situated in the slots push the pins back into the holes in the body when the handle is released.

[0013] In another embodiment of the present invention, grooves are provided on the guide that extends with an angle with respect to the axis of the pin on the side edge of the shelf. The activators shaped as a rigid rod also extend with the same angle as the guide. One end of the activator is free and sliding along the groove, the other end is attached to the pin. When the user moves the handle and thus moves the attached guide along a direction perpendicular to the rear wall of the body, the activator contacting the walls of the groove starts to slide. The pin fixed to the activator is shifted aside in a direction perpendicular to the rear wall of the body, entering into the slot or dislodging from it.

[0014] Thus the user can dislodge the pins from the holes in the body and change the

height of the shelf. Furthermore, since there are no structures like a groove or rail that form a protrusion on the body, the shelf does not have to be pulled out of the body for this process.

[0015] The cooling device designed to fulfill the objective of the present invention is illustrated in the attached figures, where:

[0016] Figure 1 – is the perspective view of a cooling device.

[0017] Figure 2 – is the bottom perspective view of the shelf and the adjustment mechanism in the first embodiment of the present invention.

[0018] Figure 3 – is the bottom perspective view of the shelf in the body in the first embodiment of the present invention.

[0019] Figure 4 – is the bottom schematic view of the shelf in the body in the second embodiment of the present invention.

[0020] Figure 5 – is the bottom schematic view of the shelf in the body in the second embodiment of the present invention.

[0021] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Body
3. Hole
4. Shelf
5. Slot
6. Pin
7. , 70. Adjustment mechanism
8. , 80. Handle
9. , 90. Guide
10. Groove
11. , 110. Activator
12. Spring
13. Handle casing

[0022] The cooling device (1) of the present invention comprises

- a body (2) having a sequence of holes (3) at different heights, situated on its different walls,
- at least one shelf (4) upon which foodstuff is stored, having more than one pin (6) fitting into the holes (3) and more than one slot (5) in which these pins (6) move, and
- an adjustment mechanism (7, 70) mounted to the shelf, providing the pins (6)

on opposite sides of the shelf (4) to be moved in the slots (5) and fitted into the holes (3) simultaneously or dislodged from the holes (3) (Figure 1).

[0023] The adjustment mechanism (7, 70) comprises

- a handle (8, 80) by which the user applies a force perpendicular to the front side of the shelf (4) and parallel to the plane of the shelf (4),
- a guide (9, 90) that provides the direction and course of the force applied by the user to be changed towards the pins (6) situated on the different side edges of the shelf (4) and moving in reverse directions such that the force is parallel to the front side of the shelf (4) and
- a activator (11, 110) that moves by the force applied by the user on the handle (8, 80) in the direction allowed by the guide (9, 90) providing the pin (6) to be fitted into the slot (5) (Figure 2 and 3).

[0024] In this embodiment of the present invention, the force applied on the handle (8, 80) by the user reaches the pins (6) by means of the activators (11, 110). The guide (9, 90) provides the applied force to be transferred in the most suitable direction to the pins (6) situated on the opposite sides of the shelf (4). The activators (11, 110) that join with the pins (6) moving in reverse directions with respect to each other, can be controlled by one handle (8, 80). Accordingly, when the user e.g. pulls the handle (8, 80) towards her, the pins (6) are dislodged from the holes (3) on the side walls of the body (2). The shelf (4) that is dislodged from the holes (3) is displaced upwards or downwards within the body (2) to adjust to the desired height. The shelf (4) is fixed in its adjusted location by providing the pins (6) to be seated in the holes (3) at this level.

[0025] In an embodiment of the present invention, the adjustment mechanism (7) comprises cord-like activators (11) and pulley-like guides (9) on which the activators (11) are wound or goes around thereof. One end of the activator (11) is joined to the pin (6) and the other to the handle (8). In this embodiment, the guides (9) are fixed to the shelf (4); the activators (11) are pulled directly by the handle (8). The activator (11) extends from the handle (8) to the guide (9) parallel to the side wall of the body (2), after the guide (9), perpendicular to the side wall. Consequently, the movement of the handle (8) parallel to the side wall is changed by the guide (9) by 90° and transferred to the pins (6). The adjustment mechanism (7) furthermore comprises a casing (13) in which the handle (8) slides forwards and backwards. Since the cord-like activator (11) can only withstand the pulling forces but not the pushing forces, the adjustment mechanism (7) furthermore comprises springs (12) situated in the slots (5) that push the pins (6) towards the hole (3).

[0026] In this embodiment of the present invention, when the user pulls the handle (8) towards her, the pins (6) on the opposite sides of the shelf (4) are pulled towards into the slots (5), leaving the holes (3) on the side walls of the body (2). In this position, the shelf (4) can be moved upwards or downwards within the body (2) for adjusting the height. When the shelf (4) is adjusted to the desired height, the user releases the handle (8). The springs (12) in the slots (5) push the pins (6) towards the holes (3) on the side walls of the body (2) providing to fix the shelf (4). The springs (12) also activate the handle (8) inside the handle casing (13) towards the rear side of the body (2) by means of the activators (11).

[0027] In a second embodiment of the present invention, the adjustment mechanism (70) comprises rigid rod-like activators (110) and at least one groove (10) on the guide (90) in which the activator (110) slides. In this embodiment, the guide (90) and the handle (80) are attached to each other, moving together in a direction perpendicular to the rear wall of the body (2). The grooves (10) extend preferably symmetrical with respect to each other and with an angle to the movement direction of the handle (80). The activator (110) and the pin (6) are fixed to each other with an angle in between, and the free end of the activator (110) moves along the groove (10). The movement of the guide (90) is transferred to the activator (110) by means of the contact of the curvilinear walls of the groove (10) (Figure 4 and Figure 5).

[0028] In this embodiment of the present invention, when the user pulls the handle (80) towards her, the guide (90) moves towards the front side of the shelf (4). The activators (110) in the two grooves (10) are forced to slide along the grooves (10) towards the rear of the body (2). This movement causes the two activators (110) to move such that they get closer due to the angle of the grooves (10). This in turn provides the pins (6) to move towards each other, thus being dislodged from the holes (3) on the side walls of the body (2). In this position, the shelf (4) can be moved upwards or downwards within the body (2) for adjusting the height. When the shelf (4) is adjusted to the desired height, the user pushes the handle (8) forwards. The grooves (10) on the guide (90), this time force the activators (110) to move apart from each other. The pins (6) are again shifted aside in reverse directions respectively, entering into the holes (3) on the side walls of the body (2), providing the shelf (4) to be fixed at the adjusted height.

[0029] In this embodiment, since the rigid rod-like activator (110) can withstand both the push and the pull forces, the adjustment mechanism (70) does not need another mechanism situated in the slot (5) and pushes the pin (6) towards the hole (3).

However, for ease of use, the adjustment mechanism (70) furthermore comprises springs (12) situated in the slots (5) that push the pins (6) towards the hole (3). Consequently, the user only pulls the handle (80) towards her, and when the suitable position is attained, the pins (6) are fitted into the holes (3) as the handle (80) is released.

[0030] By means of the cooling device of the present invention, the user can dislodge the pins (6) from the holes (3) in the body (2) by one hand and change the height of the shelf (4). The shelf (4) does not have to be pulled out of the body (2) for this process.

Claims

- [0001] A cooling device (1) comprising a body (2) having an array of holes (3) at different heights, on the different walls thereof, at least one shelf (4) upon which foodstuff is stored, having more than one pin (6) fitting into the holes (3) and more than one slot (5) in which these pins (6) move, **and characterized by** an adjustment mechanism (7, 70) mounted to the shelf (4) , providing the pins (6) on the opposite sides of the shelf (4) to be moved in the slots (5) and fitted into the holes (3) or dislodged from the holes (3) simultaneously, having: a handle (8, 80) by which the user applies a force perpendicular to the front side of the shelf (4) and parallel to the plane of the shelf (4), a guide (9, 90) that provides the direction and course of the force applied by the user to be changed towards the pins (6) situated on the different sides of the shelf (4) and moving in reverse directions respectively such that the force is parallel to the front side of the shelf (4) and a activator (11, 110) that moves by the force applied by the user on the handle (8, 80) in the direction allowed by the guide (9, 90) providing the pin (6) to be fitted into the slot (5).
- [0002] A cooling device (1) as in Claim 1, **characterized by** rope-like activators (11) and pulley -like guides (9) around which the activators (11) are wound or go over.
- [0003] A cooling device (1) as in Claim 2, **characterized by** a activator (11) having one end attached to the pin (6) and the other end to the handle (8).
- [0004] A cooling device (1) as in Claim 2 or 3, **characterized by** an adjustment mechanism (7) mounted to the shelf (4) comprising a handle casing (13) in which the handle (8) slides forwards or backwards.
- [0005] A cooling device (1) as in Claim 2, 3 or 4, **characterized by** an adjustment mechanism (7) comprising springs (12) situated in the slot (5) that push the pin (6) towards the hole (3).
- [0006] A cooling device (1) as in Claim 1, **characterized by** an adjustment mechanism (70) comprising a groove (10) on the guide (90) extending by making an angle to the movement direction of the handle (80) and a activator (110) attached to the pin (6) such that there is an angle there between, with the free end moving along the groove (10).
- [0007] A cooling device (1) as in Claim 6, **characterized by** a guide (90) and a handle (80) connected to each other and a activator (110) with one end fixed to the pin

(6) and the free end moving forwards or backwards along the groove (10).

Figure 1

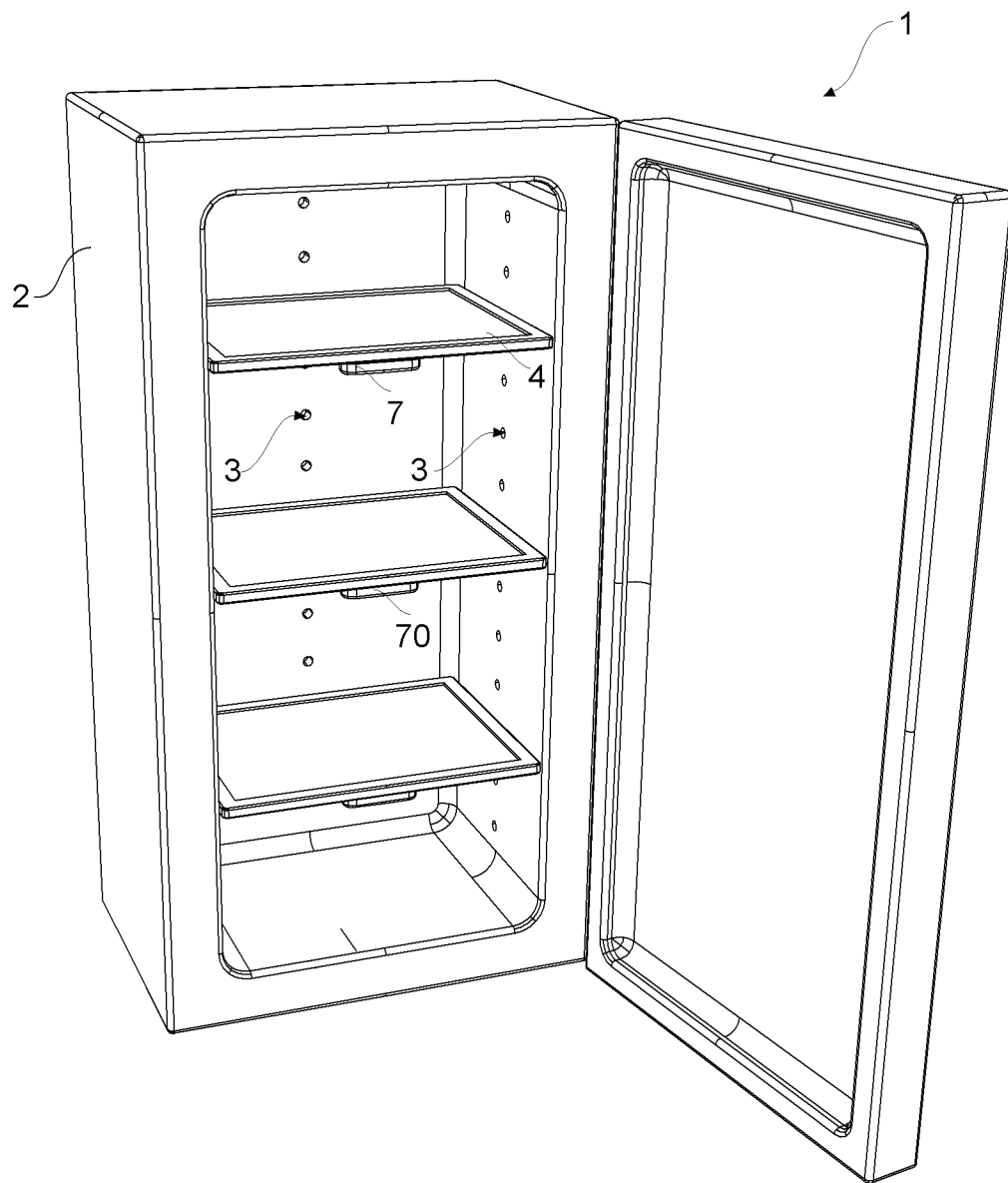


Figure 2

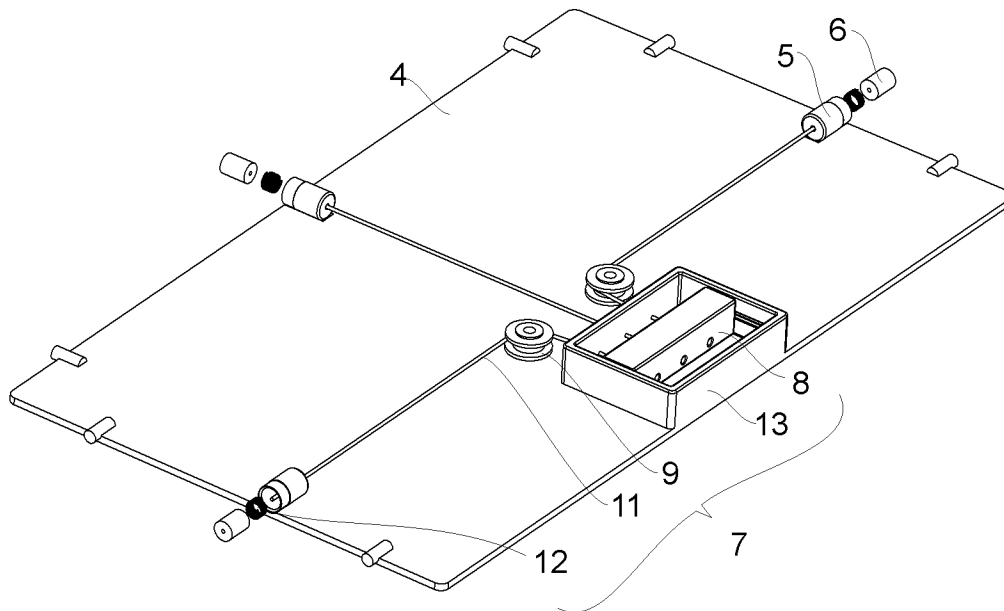


Figure 3

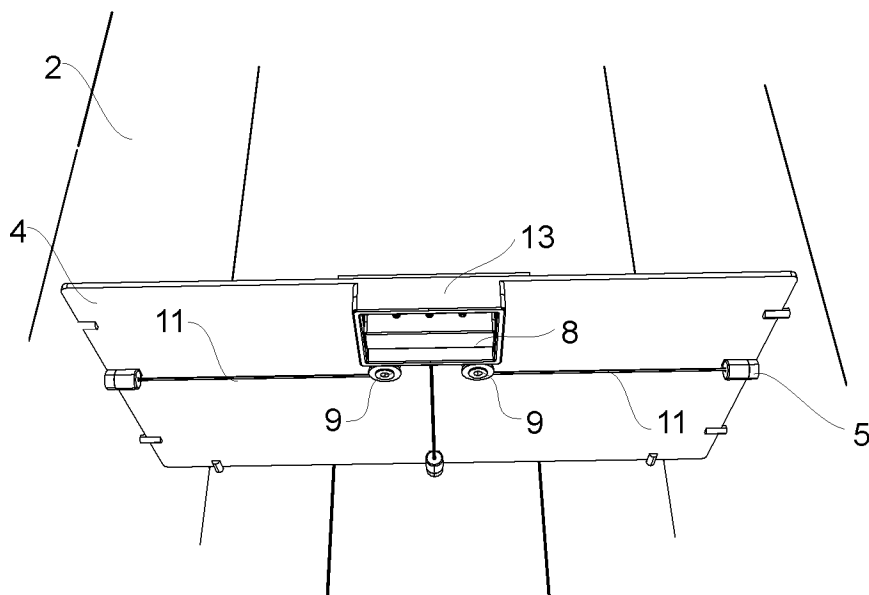


Figure 4

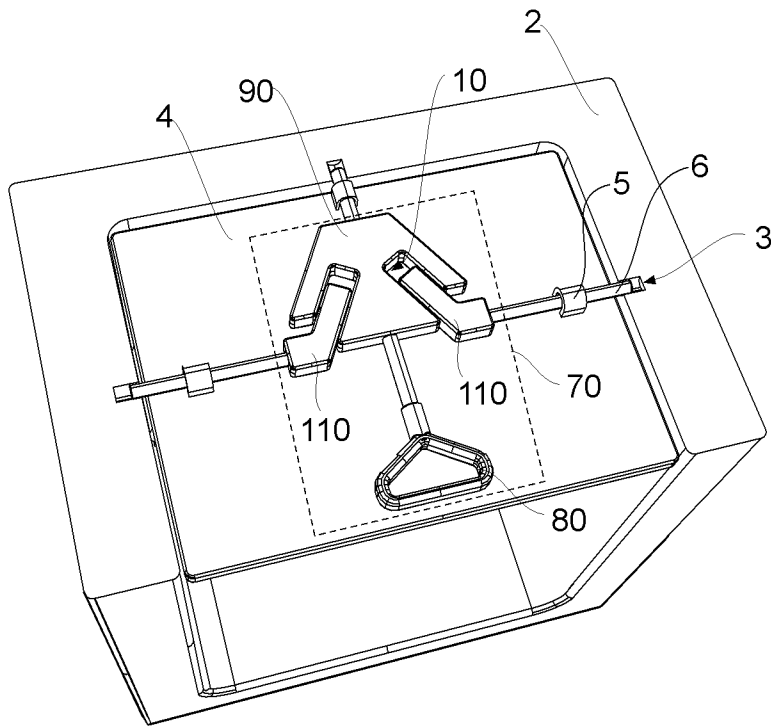
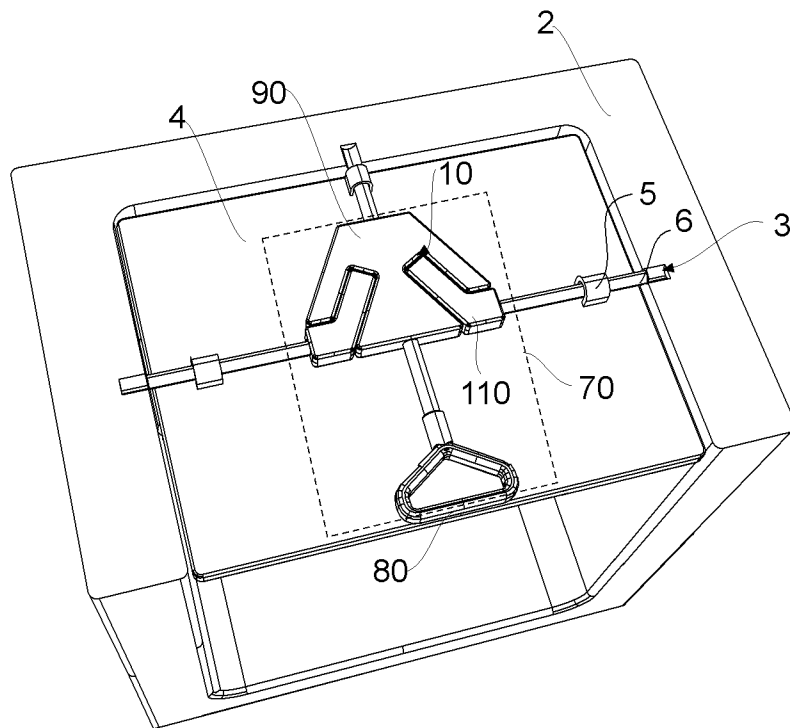


Figure 5



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/053120

A. CLASSIFICATION OF SUBJECT MATTER

INV. F25D25/02

ADD. F25D25/04

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)

F25D A47B

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 practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 420 173 A (HALL RUSSELL M) 6 May 1947 (1947-05-06) figures 1-5	1
Y	column 2, line 48 - column 3, line 21 -----	2,3,5-7
Y	US 3 885 846 A (CHUANG LIEH ET AL) 27 May 1975 (1975-05-27) figures 1,2	2,3,5
	column 2, line 13 - column 2, line 62 -----	
Y	US 2 861 695 A (CARBARY RICHARD J) 25 November 1958 (1958-11-25) figures 2,5	6,7
	column 1, line 15 - line 19 column 3, line 70 - column 4, line 35 -----	

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

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)

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

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

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

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.

* & * document member of the same patent family

Date of the actual completion of the international search

5 September 2007

Date of mailing of the international search report

12/09/2007

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Dezso, Gabor

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/053120

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2420173	A	06-05-1947	NONE	
US 3885846	A	27-05-1975	NONE	
US 2861695	A	25-11-1958	NONE	