



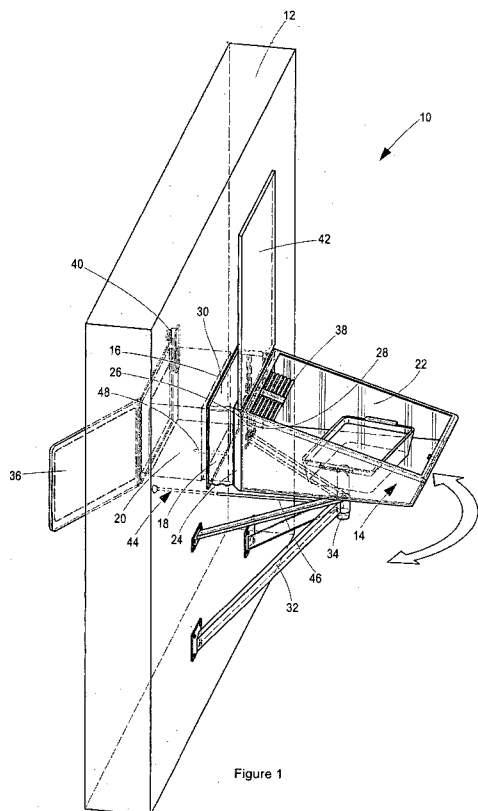
- (51) International Patent Classification:
A47J 36/00 (2006.01) F24J 2/02 (2006.01)
- (21) International Application Number:
PCT/ZA2013/000080
- (22) International Filing Date:
23 October 2013 (23.10.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
2013/03110 29 April 2013 (29.04.2013) ZA
2013/07208 26 September 2013 (26.09.2013) ZA
- (72) Inventor; and
(71) Applicant : VAN WYK, Johannes Abraham [ZA/ZA];
626 Carolina Street, Faerie Glen, Pretoria (ZA).
- (74) Agent: SIBANDA & ZANTWIJK; PO Box 1615,
Houghton, 2041, Johannesburg, Gauteng (ZA).

(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, LT, 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, 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).

[Continued on next page]

(54) Title: SOLAR COOKER



(57) Abstract: A solar cooker (10) includes a container (14) having a transparent operative top surface (22) and an operative side wall (24) that defines an aperture (26). A dwelling wall (12) defines an aperture (20), which is framed by a wall mount (16) secured to the dwelling wall (12). The container (14) is connected to the wall mount (16) and movably relative to the wall mount (16) so as to permit proper alignment of the container (14) with the sun. A flexible conduit (18) may connect the wall mount (16) to the container (14). Alternatively, a portion of the container side wall (124) and a portion of the wall mount (16) may be curved so as to nest one within the other and permit relative slidable movement therebetween.

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

Published:

- *with international search report (Art. 21(3))*

SOLAR COOKER

BACKGROUND

The present invention relates to a solar cooker. More specifically, the present invention relates to a solar cooker that is: (i) secured to the wall of a dwelling; (ii) accessible through an aperture defined by the wall; and (iii) rotatable relative to the wall.

Solar cookers are known. For instance, US2012/0042873 "Heating cabinet" to LIM *et al* and US 4,655,196 "Through the wall solar cooker" to KERR describe solar cookers secured to a wall, which are accessible via an aperture defined by the wall.

It is also known for self-standing solar cookers to be rotatably mounted to a 55-gallon drum. The webpage www.solarcooking.org/bkerr/DoltYourself.htm describes such an arrangement.

Furthermore, WO2009/138020 "A kitchen with a directional revolving solar stove" to SONG describes a solar cooker secured to the outside of a kitchen wall, wherein the kitchen is rotatable to direct the solar cooker towards the sun.

A drawback of known systems is that, since the solar cookers secured to walls do not provide for relative movement or rotation between the solar cooker and the wall, the orientation of the solar cooker is not easily adjusted for optimal alignment with the sun. This is particularly problematic during winter months.

The solar cooker according to the present invention aims to address this drawback by permitting relative movement or rotation between the solar cooker and the wall.

SUMMARY OF THE INVENTION

According to a first embodiment of the present invention, a solar cooker includes:

a container having a transparent operative top surface, and an operative side wall that defines an aperture;

a first door for regulating access to the container via the aperture defined by the container;

a wall of a dwelling, the wall defining an aperture;

a wall mount secured to the wall of the dwelling, the wall mount defining an aperture, and framing the aperture defined by the wall of the dwelling;

the container being connected to the wall mount,

characterised in that the container is movable relative to the wall mount.

Typically, a flexible conduit extends between the aperture defined by the wall mount and the aperture defined by the container, the flexible conduit being connected at one end to the wall mount and at the other end to the container. Generally, the conduit is sealably connected to both the container and the wall mount.

Alternatively, a portion of the side wall of the container is curved, and the aperture defined by the container is located within such curved portion. Typically, a portion of the wall mount is also curved, and the aperture defined by the wall mount is located within such curved portion. Preferably, the radius of curvature of the curved portion of the side wall of the container corresponds to the radius of curvature of the curved portion of the wall mount, such that the curved portions of the side wall and the wall mount can nest one within the other. Preferably, the apertures defined by the container and the wall mount may be aligned to permit access to the container.

Typically, the solar cooker further includes a support for supporting the container therein, the container being rotatably mounted to the support.

Generally, the transparent operative top surface of the container is hingedly mounted to the container.

Preferably, the container includes an opaque lid that is hingedly connected to the container, and that overlies the transparent operative top surface of the container when the lid is in a closed condition.

Typically, the container includes a heating element.

Generally, the solar cooker further includes a thermostat for, in use, regulating the temperature within the container.

Preferably, the first door is hingedly connected to the side wall of the container defining the aperture.

Typically, the solar cooker further includes a second door hingedly mounted to the wall mount, for regulating access through the aperture defined by the wall mount.

Generally, the solar cooker further includes means for rotating the container relative to the support.

Preferably, the rotating means can be actuated from inside the dwelling.

Typically, the solar cooker further includes an indicator visible to a user located within the dwelling, for indicating the orientation of the container.

According to a second embodiment of the present invention, a solar cooker includes:

a container having a transparent operative top surface, and an operative side wall that defines an aperture;

a first door for regulating access to the container via the aperture defined by the container;

a support for rotatably supporting the container thereon;

a wall mount securable to a wall of a dwelling and, in use, framing an aperture defined by the wall of the dwelling, the wall mount defining an aperture;

a flexible conduit connectable at one end to the wall mount and at the other end to the container, for extending between the aperture defined by the wall mount and the aperture defined by the container,

wherein, in an assembled condition, rotation of the container relative to the support causes the container to move relative to the wall mount.

Typically, the transparent operative top surface of the container is hingedly mounted to the container.

Generally, the container includes an opaque lid that is hingedly connected to the container, and that overlies the transparent operative top surface of the container when the lid is in a closed condition.

Preferably, the container includes a heating element.

Typically, the solar cooker further includes a thermostat for, in use, regulating the temperature within the container.

Generally, the first door is hingedly connected to the side wall of the container defining the aperture.

Preferably, the solar cooker further includes a second door hingedly mounted to the wall mount, for regulating access through the aperture defined by the wall mount.

Typically, the solar cooker further includes means for rotating the container relative to the support.

Generally, the rotating means can, in use, be actuated from inside the dwelling.

Preferably, the solar cooker further includes an indicator that is, in use, visible to a user located within the dwelling for indicating the orientation of the container.

According to a third embodiment of the present invention, a solar cooker includes:

a container having a transparent operative top surface and at least one side wall, at least a portion of the side wall of the container being curved and defining an aperture within the curved portion;

a first door for regulating access to the container via the aperture defined by the container; and

a wall mount securable to a wall of a dwelling and, in use, framing an aperture defined by the wall of the dwelling, the wall mount having a curved portion with a radius corresponding to the radius of the curved portion of the container side wall, the curved portion of the wall mount defining an aperture,

wherein, in an assembled condition: (i) the curved portions of the container side wall and the wall mount nest one within the other; (ii) the apertures defined by the wall mount and the container side wall may be aligned to permit access to the container; and (iii) the container is movable relative to the wall mount.

Typically, the solar cooker further includes a support for supporting the container therein, the container being rotatably mounted to the support.

Generally, the transparent operative top surface of the container is hingedly mounted to the container.

Preferably, the container includes an opaque lid that is hingedly connected to the container, and that overlies the transparent operative top surface of the container when the lid is in a closed condition.

Typically, the container includes a heating element.

Generally, the solar cooker further includes a thermostat for, in use, regulating the temperature within the container.

Preferably, the first door is hingedly connected to the side wall of the container defining the aperture.

Typically, the solar cooker further includes a second door hingedly mounted to the wall mount, for regulating access through the aperture defined by the wall mount.

Generally, the solar cooker further includes means for rotating the container relative to the support.

Preferably, the rotating means can, in use, be actuated from inside the dwelling.

Typically, the solar cooker further includes an indicator that is, in use, visible to a user located within the dwelling for indicating the orientation of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a side perspective view of a solar cooker according to a first embodiment of the invention;

Figure 2 is a view of the solar cooker in Figure 1 viewed from inside the dwelling;

Figure 3 is a top perspective view of a solar cooker according to a second embodiment of the invention;

Figure 4 is a view of the solar cooker in Figure 3 viewed from inside the dwelling; and

Figure 5 is a side perspective view of the solar cooker in Figure 3.

DESCRIPTION OF THE INVENTION

With reference to Figure 1, a solar cooker 10 according to a first embodiment of the invention is in an assembled condition, and includes a dwelling wall 12, a container 14, a wall mount 16 and a conduit 18.

The dwelling wall 12 is preferably a kitchen external wall, defining a rectangular aperture 20.

The container 14 comprises an insulated box with an angled, transparent operative top surface (i.e. lid) 22. The inside surface of the container 14 is heat reflective. The transparent lid 22 is made either from Perspex or glass and is hingedly connected to a side wall 24 of the container 14. The rear side wall 24 of the container defines a rectangular aperture 26. And, a first door 28, which is hingedly connected to the rear side wall 24, regulates access to the interior of the container via the aperture 26 defined by the rear side wall 24.

The wall mount 16 is sized and shaped to frame the aperture 20 defined by the dwelling wall 12, and defines an aperture 30. The wall mount 16 is secured to the dwelling wall 12 by bolts.

A conduit 18, in the form of a flexible tube, is sealably connected to the container 14 at one axial end and to the wall mount 16 at the other axial end, and communicates between the aperture 30 defined by the wall mount 16 and the aperture 26 defined by the side wall 22 of the container 12.

A support 32 is secured to the dwelling wall 12, and supports the container 14 thereon. The container 14 is rotatably mounted to the support 32 via a journal 34.

A second door 36 is hingedly mounted to the inside of the dwelling wall 12, adjacent the aperture 20 defined by the dwelling wall 12.

A heating element 38 is located within the container 14. This heating element 38 is powered by either electricity or gas so as to increase the temperature in the container 14 when solar radiation is insufficient. A thermostat 40 controls the heating element 38, thereby controlling the temperature within the container 14.

An outer lid 42 in the form of an opaque planar sheet has a bottom surface that is heat reflective. The outer lid 42 is hingedly secured to the container 14, adjacent the top of the rear side wall 22 of the container 14. When in the closed condition, the outer lid 42 overlies the transparent lid 22.

Means 44 for rotating the container 14 relative to the support 32 is located adjacent the journal 32. A rod 46 extends from the rotating means 44, towards the dwelling wall 12 such that a user (not shown) located within the dwelling can actuate the rod 46 to rotate

the container 14 to maximize solar radiation of the container 14. In a preferred embodiment, the rod 46 could be linked to the journal 34 via a lever arm (not shown) such that axial displacement of the rod 46 causes the journal 34 (and therefore, the container 14) to rotate relative to the support 32. Alternatively, the rotating means 44 could comprise an electric motor (not shown), which causes the journal 34 and/or the container 14 to rotate.

An indicator 48, in the form of a pointer, is located within the aperture 20 defined by the dwelling wall 12. The indicator 48 is visible to a user located inside the dwelling and enables the user to determine the orientation of the container 14 without having to exit the dwelling.

In use, the outer lid 42 is lifted to permit solar radiation to enter the container 14 via the transparent lid 22 and heat the inside of the container 14. A user, having regard to the indicator 48, adjusts the orientation of the container 14 by actuating the rod 46, thereby rotating the container 14 relative to the support 32 and maximizing solar radiation of the container 14. The second and first doors 36 and 28 are opened and a cooking vessel containing foodstuff to be cooked is inserted through the dwelling wall 12 aperture 20, via the conduit 18 and into the container 14. The doors 28 and 36 are then closed to retain the heat within the container 14. The thermostat 40 is set to the required temperature and the heating element 38 is powered, as and if required.

It will be appreciated that flexibility of the conduit 18 enables the container 14 to rotate relative to the support 32 and thereby move relative to the wall mount 16 while maintaining the sealed passageway between the aperture 30 defined by the wall mount 16 and the aperture 26 defined by the container 14.

The solar cooker according to a second embodiment of the invention comprises the container 14, wall mount 16, flexible conduit 18 and support 32 (with attachments) in a kit form (i.e. in a disassembled state / not secured to a dwelling wall 12).

With reference to Figure 2, a solar cooker 110 according to a third embodiment of the invention is generally similar to the solar cooker 10 according to the second embodiment of the invention. However, the solar cooker 110 according to the third embodiment does not include a flexible conduit 18. Instead:

- a portion of the rear side wall 124 of the container 114 is curved, defining the aperture 128 within the curved portion of the rear side wall 124; and

- the wall mount 116 has a curved portion with a radius corresponding to the radius of the curved portion of the container 114 side wall 124, defining the aperture 30 within the curved portion of the wall mount 116.

Since the radius of curvature of the rear side wall 124 of the container 114 and the radius of curvature of the wall mount 116 are similar (i.e. being a constant radius calculated from the journal 132), the curved portions of the rear side wall 124 of the container 114 and the wall mount 116 nest one within each other. This arrangement permits relative slideable movement between the curved portions of the rear side wall 124 of the container 114 and the wall mount 116, consequently permitting relative movement of the container 114 and the wall mount 116.

Reference numerals 112, 116, 120, 122, 126, 134, 136, 138, 140, 142, 144, 146 and 148 in Figures 3 to 5 correspond to reference numerals 12, 16, 20, 22, 26, 34, 36, 38, 40, 42, 44, 46 and 48 in Figures 1 and 2, respectively.

It will be appreciated that either the aperture 130 defined by the wall mount 116 is wider than the aperture 126 defined by the rear side wall 124 of the container 114. Or, the two apertures 130 and 126 may be aligned upon a predetermined orientation of the container 114 so as to permit access to the container 114.

Although not shown in the Figures, it will also be appreciated that the solar cooker 10 and 110 could include a light and a fan (for distributing heat) within the container 14 and 114.

CLAIMS

1. A solar cooker including:

a container having a transparent operative top surface, and an operative side wall that defines an aperture;

a first door for regulating access to the container via the aperture defined by the container;

a wall of a dwelling, the wall defining an aperture;

a wall mount secured to the wall of the dwelling, the wall mount defining an aperture, and framing the aperture defined by the wall of the dwelling;

the container being connected to the wall mount,

characterised in that the container is movable relative to the wall mount.

2. A solar cooker according to claim 1, wherein a flexible conduit extends between the aperture defined by the wall mount and the aperture defined by the container, the flexible conduit being connected at one end to the wall mount and at the other end to the container.
3. A solar cooker according to claim 2, wherein the conduit is sealably connected to both the container and the wall mount.
4. A solar cooker according to claim 1, wherein a portion of the side wall of the container is curved, and the aperture defined by the container is located within such curved portion.
5. A solar cooker according to claim 4, wherein a portion of the wall mount is curved, and the aperture defined by the wall mount is located within such curved portion.
6. A solar cooker according to claim 5, wherein the radius of curvature of the curved portion of the side wall of the container corresponds to the radius of curvature of the

curved portion of the wall mount, such that the curved portions of the side wall and the wall mount can nest one within the other.

7. A solar cooker according to claim 6, wherein the apertures defined by the container and the wall mount may be aligned to permit access to the container.
8. A solar cooker according to either claim 13 of claim 7, further including a support for supporting the container therein, the container being rotatably mounted to the support.
9. A solar cooker according to claim 8, wherein the transparent operative top surface of the container is hingedly mounted to the container.
10. A solar cooker according to claim 9, wherein the container includes an opaque lid that is hingedly connected to the container, and that overlies the transparent operative top surface of the container when the lid is in a closed condition.
11. A solar cooker according to claim 10, wherein the container includes a heating element.
12. A solar cooker according to claim 11, further including a thermostat for, in use, regulating the temperature within the container.
13. A solar cooker according to claim 12, wherein the first door is hingedly connected to the side wall of the container defining the aperture.
14. A solar cooker according to claim 13, further including a second door hingedly mounted to the wall mount, for regulating access through the aperture defined by the wall mount.
15. A solar cooker according to claim 14, further including means for rotating the container relative to the support.
16. A solar cooker according to claim 15, wherein the rotating means can be actuated from inside the dwelling.

17. A solar cooker according to claim 16, further including an indicator visible to a user located within the dwelling, for indicating the orientation of the container.
18. A solar cooker including:
- a container having a transparent operative top surface, and an operative side wall that defines an aperture;
 - a first door for regulating access to the container via the aperture defined by the container;
 - a support for rotatably supporting the container thereon;
 - a wall mount securable to a wall of a dwelling and, in use, framing an aperture defined by the wall of the dwelling, the wall mount defining an aperture;
 - a flexible conduit connectable at one end to the wall mount and at the other end to the container, for extending between the aperture defined by the wall mount and the aperture defined by the container,
- wherein, in an assembled condition, rotation of the container relative to the support causes the container to move relative to the wall mount.
19. A solar cooker according to claim 18, wherein the transparent operative top surface of the container is hingedly mounted to the container.
20. A solar cooker according to claim 19, wherein the container includes an opaque lid that is hingedly connected to the container, and that overlies the transparent operative top surface of the container when the lid is in a closed condition.
21. A solar cooker according to claim 20, wherein the container includes a heating element.
22. A solar cooker according to claim 21, further including a thermostat for, in use, regulating the temperature within the container.

23. A solar cooker according to claim 22, wherein the first door is hingedly connected to the side wall of the container defining the aperture.
24. A solar cooker according to claim 23, further including a second door hingedly mounted to the wall mount, for regulating access through the aperture defined by the wall mount.
25. A solar cooker according to claim 24, further including means for rotating the container relative to the support.
26. A solar cooker according to claim 25, wherein the rotating means can, in use, be actuated from inside the dwelling.
27. A solar cooker according to claim 26, further including an indicator that is, in use, visible to a user located within the dwelling for indicating the orientation of the container.
28. A solar cooker including:

a container having a transparent operative top surface and at least one side wall, at least a portion of the side wall of the container being curved and defining an aperture within the curved portion;

a first door for regulating access to the container via the aperture defined by the container; and

a wall mount securable to a wall of a dwelling and, in use, framing an aperture defined by the wall of the dwelling, the wall mount having a curved portion with a radius corresponding to the radius of the curved portion of the container side wall, the curved portion of the wall mount defining an aperture,

wherein, in an assembled condition: (i) the curved portions of the container side wall and the wall mount nest one within the other; (ii) the apertures defined by the wall mount and the container side wall may be aligned to permit access to the container; and (iii) the container is movable relative to the wall mount.

29. A solar cooker according to claim 28, further including a support for supporting the container therein, the container being rotatably mounted to the support.
30. A solar cooker according to claim 29, wherein the transparent operative top surface of the container is hingedly mounted to the container.
31. A solar cooker according to claim 30, wherein the container includes an opaque lid that is hingedly connected to the container, and that overlies the transparent operative top surface of the container when the lid is in a closed condition.
32. A solar cooker according to claim 31, wherein the container includes a heating element.
33. A solar cooker according to claim 32, further including a thermostat for, in use, regulating the temperature within the container.
34. A solar cooker according to claim 33, wherein the first door is hingedly connected to the side wall of the container defining the aperture.
35. A solar cooker according to claim 34, further including a second door hingedly mounted to the wall mount, for regulating access through the aperture defined by the wall mount.
36. A solar cooker according to claim 35, further including means for rotating the container relative to the support.
37. A solar cooker according to claim 36, wherein the rotating means can, in use, be actuated from inside the dwelling.
38. A solar cooker according to claim 37, further including an indicator that is, in use, visible to a user located within the dwelling for indicating the orientation of the container.

1/4

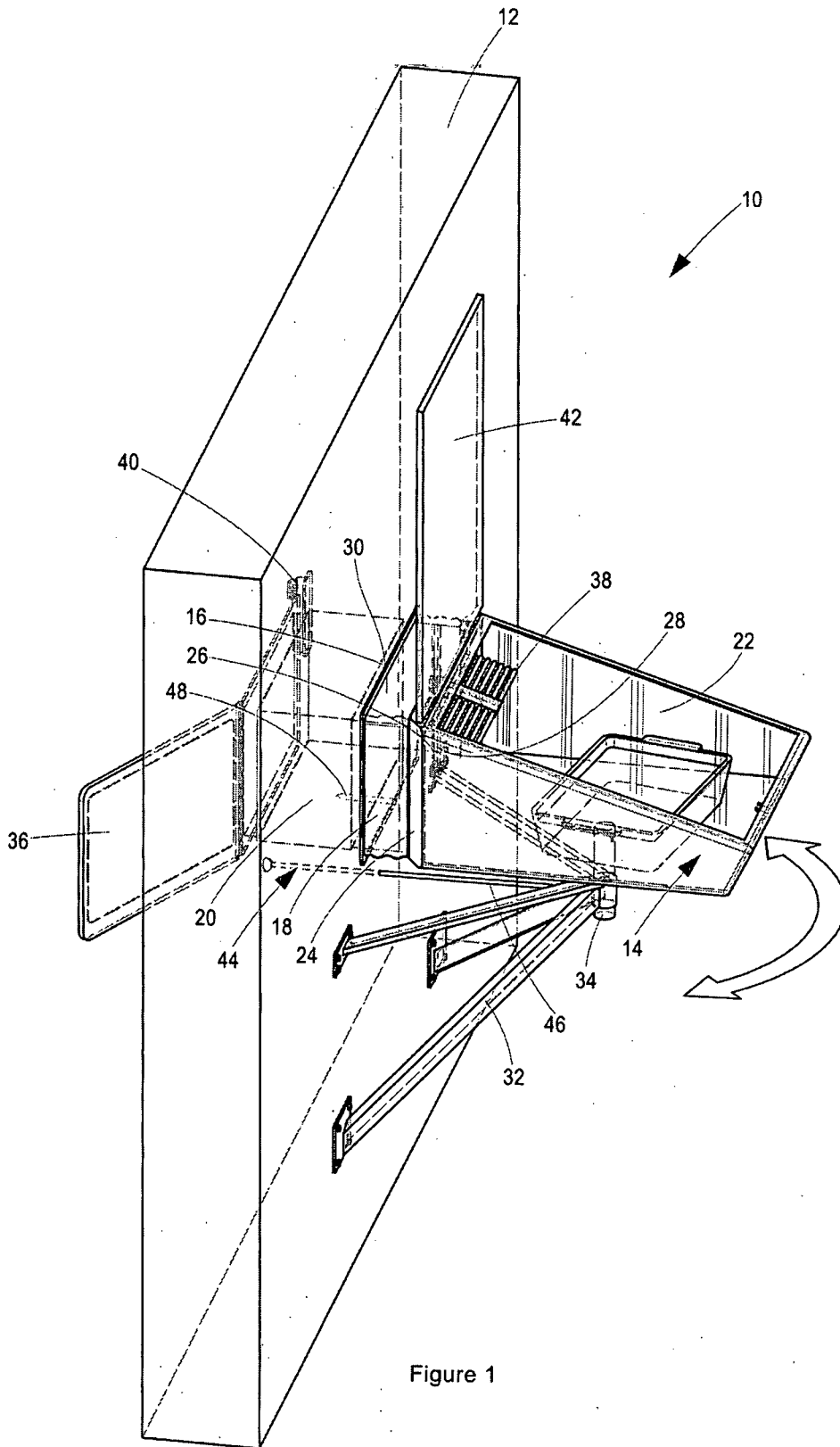
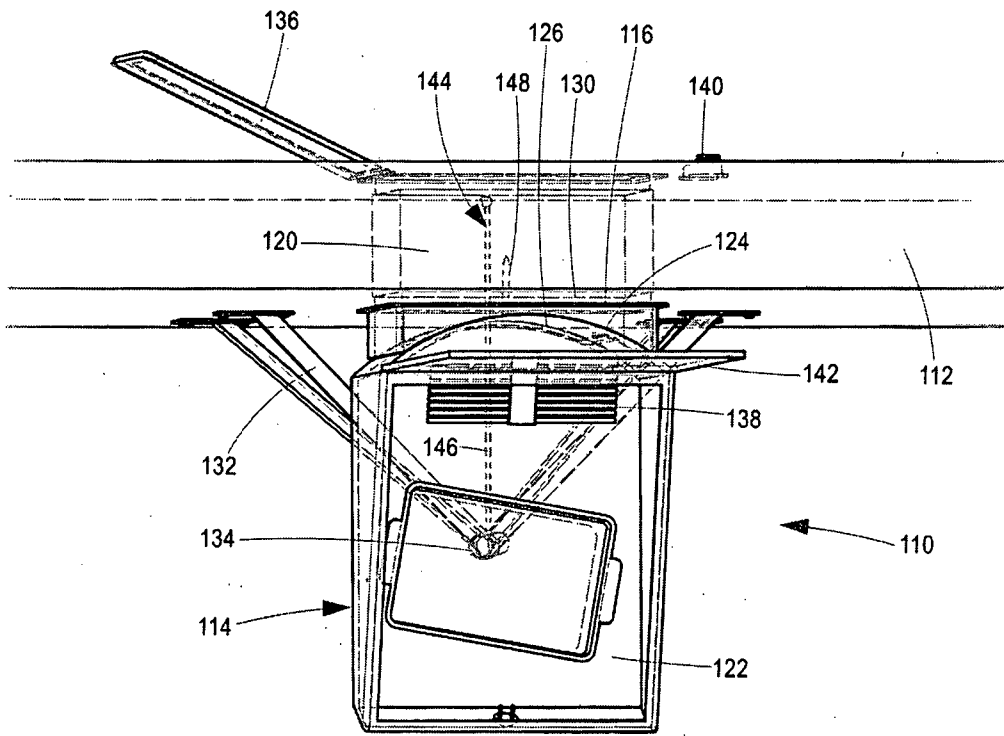
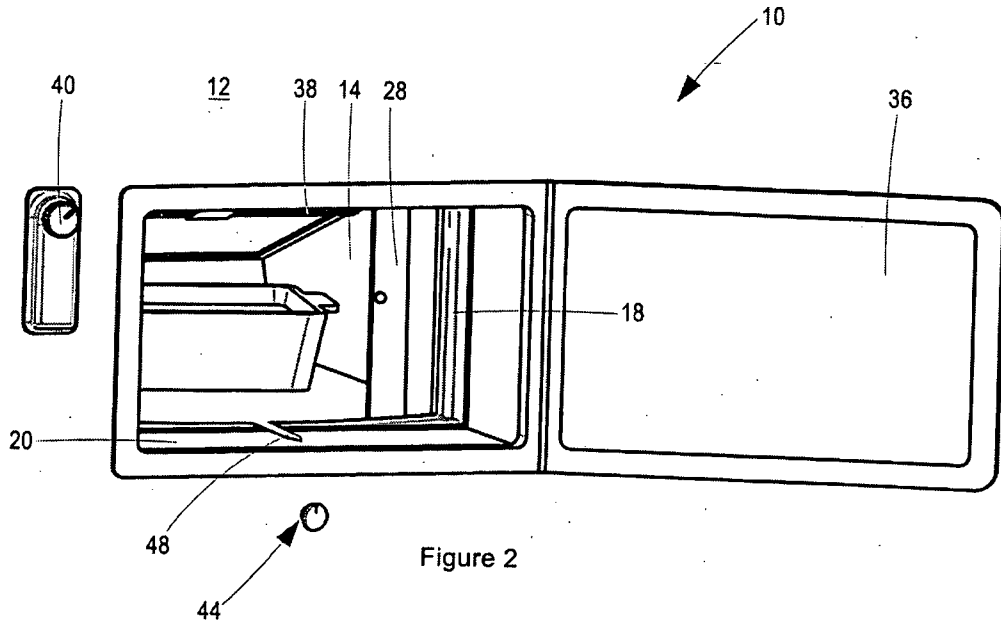
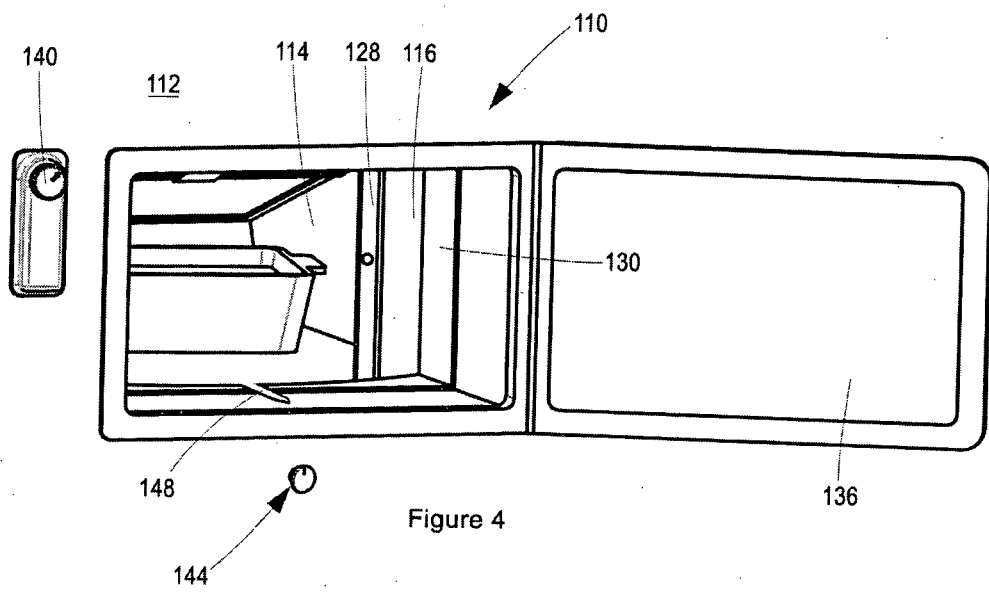


Figure 1

2/4



3/4



4/4

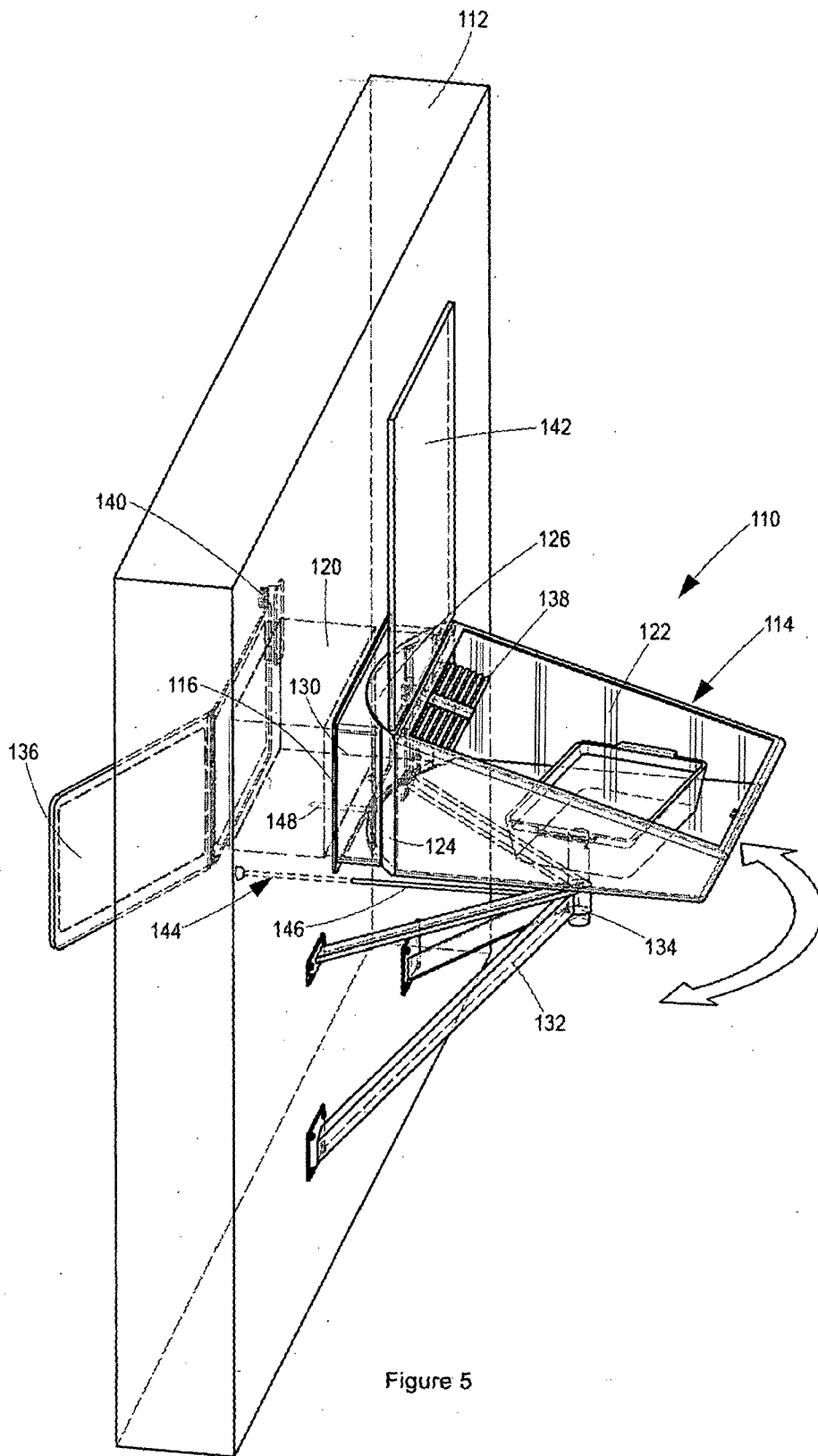


Figure 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT / ZA 2013/000080

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC: A47J 36/00 (2006.01); F24J 2/02 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) A47J, F24J</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPI, EPODOC, Fulltext</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4655196 A (KERR) 07 April 1987 (07.04.1987) figures; claims	1-38
A	ES 2207410 A1 (SAMALEA PEREZ JAVIER) 16 May 2004 (16.05.2004) column 9, line 67 - column 10, line 37; figures 10, 11	1-38
A	WO 2004042290 A1 (SAMALEA PEREZ, JAVIER) 21 May 2004 (21.05.2004) page 19, lines 12-24	1-38
A	JP 2003240356 A (MUNEHIRA SEISHIRO) 27 August 2003 (27.08.2003) paragraphs [0018][0022]; figures 8, 12	1-38
A	CN 1865805 A (WU ZHAOLIU) 22 November 2006 (22.11.2006) [online abstract, derived on 20.02.2014 from EPODOC database]; figure 1	1-38
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</p>		<p><input checked="" type="checkbox"/> See patent family annex.</p>
<p>* Special categories of cited documents:</p>		
<p>“A” document defining the general state of the art which is not considered to be of particular relevance</p>		<p>“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</p>
<p>“E” earlier application or patent but published on or after the international filing date</p>		<p>“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</p>
<p>“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)</p>		<p>“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</p>
<p>“O” document referring to an oral disclosure, use, exhibition or other means</p>		<p>“&” document member of the same patent family</p>
<p>“P” document published prior to the international filing date but later than the priority date claimed</p>		
<p>Date of the actual completion of the international search 20 February 2014 (20.02.2014)</p>		<p>Date of mailing of the international search report 25 February 2014 (25.02.2014)</p>
<p>Name and mailing address of the ISA/AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24-535</p>		<p>Authorized officer MOSSER R. Telephone No. +43 / 1 / 534 24-437</p>

INTERNATIONAL SEARCH REPORT

International application No.

PCT / ZA 2013/000080

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 2046989 U (CHEN YUANXING) 01 November 1989 (01.11.1989) [online abstract, derived on 20.02.2014 from EPODOC database]; figures 1, 2	1-38

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT / ZA 2013/000080

Patent document cited in search report			Patent family member(s)			Publication date
US	A	4655196	US	A	4655196	1987-04-07
ES	A1	2207410	WO	A1	2004042290	2004-05-21
			ES	A1	2207410	2004-05-16
			AU	A1	2003274155	2004-06-07
WO	A1	2004042290				
JP	A	2003240356	JP	A	2003240356	2003-08-27
CN	A	1865805	CN	A	1865805	2006-11-22
CN	U	2046989	CN	U	2046989	1989-11-01