

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
17 April 2008 (17.04.2008)

PCT

(10) International Publication Number
WO 2008/043127 A1

(51) International Patent Classification:

A47J 37/00 (2006.01) A47J 37/06 (2006.01)
A47J 37/04 (2006.01)

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(21) International Application Number:

PCT/AU2007/001454

(22) International Filing Date:

28 September 2007 (28.09.2007)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2006905689 13 October 2006 (13.10.2006) AU

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

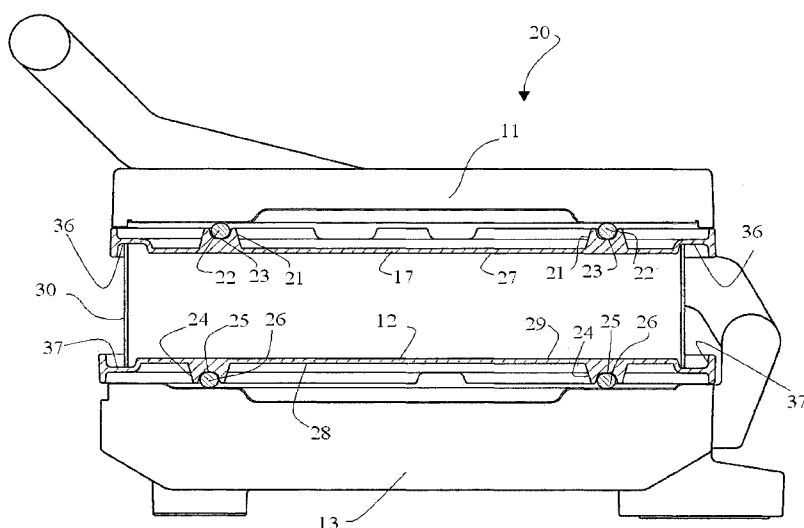
Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report

(54) Title: CHROME GRILL



(57) Abstract: A cooking device comprises a base that carries a preferably removable bottom cooking plate. The bottom cooking plate is chromium coated to minimize food-sticking on the cooking surface and to maximize heat distribution on the cooking surface. The coating may be bonded to a steel layer that is further joined to an efficient heat distributor, such as aluminum. The device may further have a top cooking plate that can be carried by an upper housing. The device can be, without limitation, a grill. The provision of both top and bottom cooking plates further enables the device to function as a sandwich press or a combination sandwich press and grill.

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Chrome Grill

Field of the Invention

5 The present technology pertains to kitchen appliances, in particular, electrical cooking appliances with chromium plated cooking surfaces.

Background of the Invention

10 Electrical cooking appliances such as grills (and toaster grills) are usually available with an upper and a lower cooking surface, often with non-stick coatings on both the cooking surfaces to avoid food sticking. Cooking surfaces made of stainless steel are also known. While a non-stick coating simplifies the clean-up process, it is easily scratched and sometimes damaged
15 by high heat. Further, non-stick coatings are not optimally energy-efficient. Stainless steel cooking surfaces on the other hand, are energy efficient and more durable. However, food sticking and taste transfer between foods can be a problem for stainless steel appliances, and cleaning can be problematic.

20 Summary and Objects of the Invention

 It is an object of the present technology to provide a scratch-resistant, energy efficient grill with improved cooking performance and reduced taste transference between foods.

25

 Accordingly, there is provided an electrical cooking device, the cooking device comprising a cooking surface that has a chromium coating, the cooking surface being adapted to receive heat from an electrical heating element.

 There is also provided a cooking device, the cooking device comprising
30 an upper housing further comprising a top plate, a base further comprising a bottom plate, wherein a cooking surface of the bottom plate is chromium coated.

Brief Description of the Drawing Figures

In order that the invention be better understood, reference is now made to the following drawing figures in which:

- 5 Figure 1 is a perspective view of a grill;
- Figure 2 is a cross section view of the grill in Figure 1;
- Figure 3 is a perspective view of an oven ring;
- Figure 4(a) is a perspective view of a foldable oven ring;
- Figure 4(b) is a perspective view of the foldable oven ring in Figure
- 10 4(a), partially folded
- Figure 4(c) is a perspective view of the foldable oven ring in Figure
- 4(a), almost fully folded;
- Figure 5(a) is a perspective view of a second foldable oven ring;
- Figure 5(b) is a perspective view of the foldable oven ring in Figure
- 15 5(a), partially folded;
- Figure 5(c) is a perspective view of the foldable oven ring in Figure
- 5(a), almost fully folded;
- Figure 6(a) is a perspective view of a third foldable oven ring;
- Figure 6(b) is a perspective view of the foldable oven ring in Figure
- 20 6(a);
- Figure 6(c) is a perspective view of the foldable oven ring in Figure
- 6(a), almost fully folded; and
- Figure 7 is a cross section view of a cooking plate.

25 Best Mode and Other Embodiments

As shown in Figure 1, a grill 10 comprises an upper housing 11 and a base 12. The upper housing 11 further comprises a top cooking plate 17, and the base 13 further comprises a bottom cooking plate 12. There may be a U-shaped frame 14 around the upper housing 11. The U-shaped frame 14 has a front handle portion 15 and is pivotally mounted onto the base 12 at a rear mounting position 16. The upper housing 11 pivots on the centre 18 of the U shaped frame to allow the top plate to be parallel to the bottom plate for an initial portion of the grill's opening, in this case about the first 50mm. There

may be user controls 19 arranged on the exterior of the chrome grill, such as variable temperature settings or power switches or independent temperature control of top and bottom plates. The embodiment shown here includes an optional oven ring 30 that can be placed between the top and bottom plates 17, 12. The top plate 17, bottom plate 12, and the oven ring 30 are removable for easy cleaning and are dishwasher safe.

Referring to Figure 2, the upper housing 11 and the base 13 each carries its own heating element that is concealed respectively by the removable top and bottom plates 17, 12. The back side of the top plate 17 comprises a raised channel 21 that extends upwardly and contains a heat transfer or positioning groove 23. The positioning groove receives an upper heating element 22 carried within the upper housing. The back side of the top plate 17 is non-reflective, permitting efficient heat absorption from the heating element. The cooking surface 27 of the top plate 17 can be flat or ribbed, and may have a dark coloured non-stick coating to avoid food sticking and to effectively radiate heat.

The bottom plate 12 includes a channel 24 which extends downwardly from the back side of the plate 12 and has a lower positioning groove 25. The lower positioning groove receives and conceals a lower element 26 carried by the base 13. The underside 28 of the bottom plate 12 is non-reflective, permitting efficient heat absorption from the heating element. The cooking surface 29 of the bottom plate is preferably flat and chromium coated, with a mirror finish. The chromium coating is energy efficient, and has a 40% to 50% faster heat up time than PTFE non-stick surfaces due to reduced heat radiation. The chromium is also a hard surface that is more scratch resistant, less prone to taste transference and has slightly better non-stick qualities than Stainless Steel. A hard, trivalent chromium plating is preferred.

In preferred embodiments where oven rings are provided, the top and bottom plates 17, 12 have vertically aligned peripheral grooves 36, 37 wherein the oven rings are placed. In these examples, the peripheral grooves 36, 37 are provided exterior to the positioning grooves 22, 25 for the heating elements 23, 26.

As shown in Figure 3, the oven ring 30 comprises a rectangular rim 31 and a heat resistant handle 32 on each side portion 33. The rim 31 encloses an

area of similar dimensions as the top and bottom plate 31, 32, and has a depth 34 for cooking foods such as fish. The inner surface of the oven ring 35 preferably has a non-stick coating. When placed between the top and the bottom plates 17, 12, the oven ring 30, along with the cooking surfaces of the plates, produce an oven effect. In the space enclosed by the oven ring, the chrome plated bottom cooking surface enables efficient heating and improved cooking performance, while the non-stick top cooking surface and the inner surface of the oven ring create radiant heat, allowing for an oven effect.

In some embodiments, the oven ring 30 may be foldable or otherwise collapsible for storage purposes.

As shown in Figure 4(a), an example of a foldable oven ring 40 comprises two foldable side portions 41. Each short side portion 41 includes a vertical, central hinge 42. The hinge 42 may protrude outwardly from the side portion 41 and form an exterior rib 44, which may be used as a handle. As shown in Figure 4(b), the four corners 43 of the oven ring 40 are non-rigid hinges, allowing the side portions 41 to fold relative to the long sides 45, 46. Figure 4(c) depicts a folded heat cloche. The hinges 42 move towards each other during folding.

Figure 5(a) depicts another foldable oven ring 50. In this example, the folding hinges 51 are located on the longer sides 52, 53. Handles 54 are located on the shorter side portions 55. The longer portions 52, 53 can be folded so that the hinges 51 move towards each other, as shown in Figure 5(b). Figure 5(c) depicts a folded oven ring 50. As the oven ring 50 is folded, the folding hinges 51 move toward and pass each other because the segments 57, 58 of the longer sides 52, 53 are unequal in length.

Figure 6 (a) depicts a further example of a foldable oven ring 60. The oven ring 60 in this example comprises three preferably polymeric hinges 61 and one corner located clasp 62. As shown in Figure 6(b), the clasp 62 is formed between a longer sidewall 63 and a shorter sidewall 64. The shorter sidewall 64 in this example includes a handle 69. In this embodiment, the first shorter sidewall 64 terminates a protruding lip 65 that is received by an elastomeric clamping groove 66 in the longer sidewall 63. As shown in Figure 6(c), when the clasp 62 is opened, the oven ring 60 can be folded along the polymeric hinges 61 in a zigzag shape 68. The aforementioned sidewalls 63, 64

form the end pieces of this "strip" 67, and the single handle 69 does not interfere with folding.

In a restaurant-style preparation, fish may be cooked in a two step process. First, the fish is pan fried to caramelize and crisp the skin, and then it
5 is transferred to an oven to finish cooking. The combination of the features in the above described grill and oven ring produces the same cooking result in a simple one step or one appliance process.

Referring to Figure 7, the top or bottom cooking plate or any heated cooking surface 70 has a top layer. The top layer 71 is the chrome or chromium
10 coating. Chrome bonds with steel, therefore the next (or second) layer 72 is made of steel, preferably stainless steel. The steel may require pre-treatment or pre-plating with other metals such as copper or nickel. In particularly preferred embodiments, the cooking plate 70 further comprises a third layer 73 that is placed adjacent to the heating element. The third layer 73 is made of
15 a material that absorbs and distributes heat quickly. For example, the third layer 73 can be an aluminium layer.

The second and third layers are metallic and may be bonded or clad. Alternatively, brazing, such as induction brazing, may be applied to join the two layers together. In some embodiments, the second and third layers may be
20 mechanically joined.

While the present invention has been disclosed with reference to particular details of construction, these should be understood as having been provided by way of example and not as limitations to the scope or spirit of the invention.

What is Claimed is

1. A cooking device, the cooking device comprising:

an upper housing further comprising an electrically heated top plate;
a base further comprising an electrically heated bottom plate;
a cooking surface of the bottom plate being chromium coated.

2. The device of claim 1, further comprising,

an U-shaped frame around the upper housing, the U-shaped frame being pivotally mounted to the base at a rear mounting position.

3. The device of claim 2 wherein,

the upper housing is adapted to pivot on a centre of the frame.

4. The device of any one of claims 1 to 3, wherein,

the bottom plate is removable.

5. The device of any one of claims 1 to 4, wherein,

the bottom plate comprises a downwardly extending channel for receiving a heating element for the base.

6. The device of any one of claims 1 to 5, wherein,

the top plate is removable.

7. The device of any one of claims 1 to 6, wherein,

the top plate has a raised channel for receiving a heating element for the upper housing.

8. The device of any one of claims 1 to 7, wherein,

the cooking surface of the bottom plate is coated with a trivalent chromium coating.

9. The device of any one of claims 1 to 8, wherein,

the top and bottom plates have formed in them vertically aligned peripheral grooves that are adapted to receive an oven ring.

10. The device of any one of claims 1 to 9, wherein,

the device is a grill.

11. The device of any one of claims 1 to 10, wherein,

the device is a sandwich press.

12. The device of any one of claims 1 to 11, wherein,

the bottom plate comprises a layer of chromium coating that is bonded to a steel layer, and the steel layer is joined to an aluminum layer, the aluminum layer being located adjacent to a heat source for the bottom plate.

13. An electrical cooking device, comprising:

a cooking surface that has a chromium coating, the cooking surface being located adjacent to and adapted to receive heat from a heating element.

14. The device of claim 13, wherein,

the coating is a trivalent chromium coating.

15. The device of claims 13 or 14, wherein,

the layer of chromium coating is bonded to a steel layer, and the steel layer being joined to an aluminum layer, the aluminum layer being located adjacent to the heating element.

16. The device of any one of claims 12 to 15, wherein,

the cooking surface is located on a bottom plate, the bottom plate being carried by a base.

17. The device of claim 16, wherein,

the bottom plate is removable from the base.

18. The device of claims 16 or 17, wherein,

the bottom plate comprises a downwardly extending groove that receives a heating element, wherein an undersurface of the bottom plate is non-reflective.

19. The device of any one of claims 13 to 17, further comprising,

a top plate, the top plate having a cooking surface that has a non-stick coating.

20. The device of claim 19, wherein,

the top plate conceals a heating element, the top plate having a non-reflective upper surface.

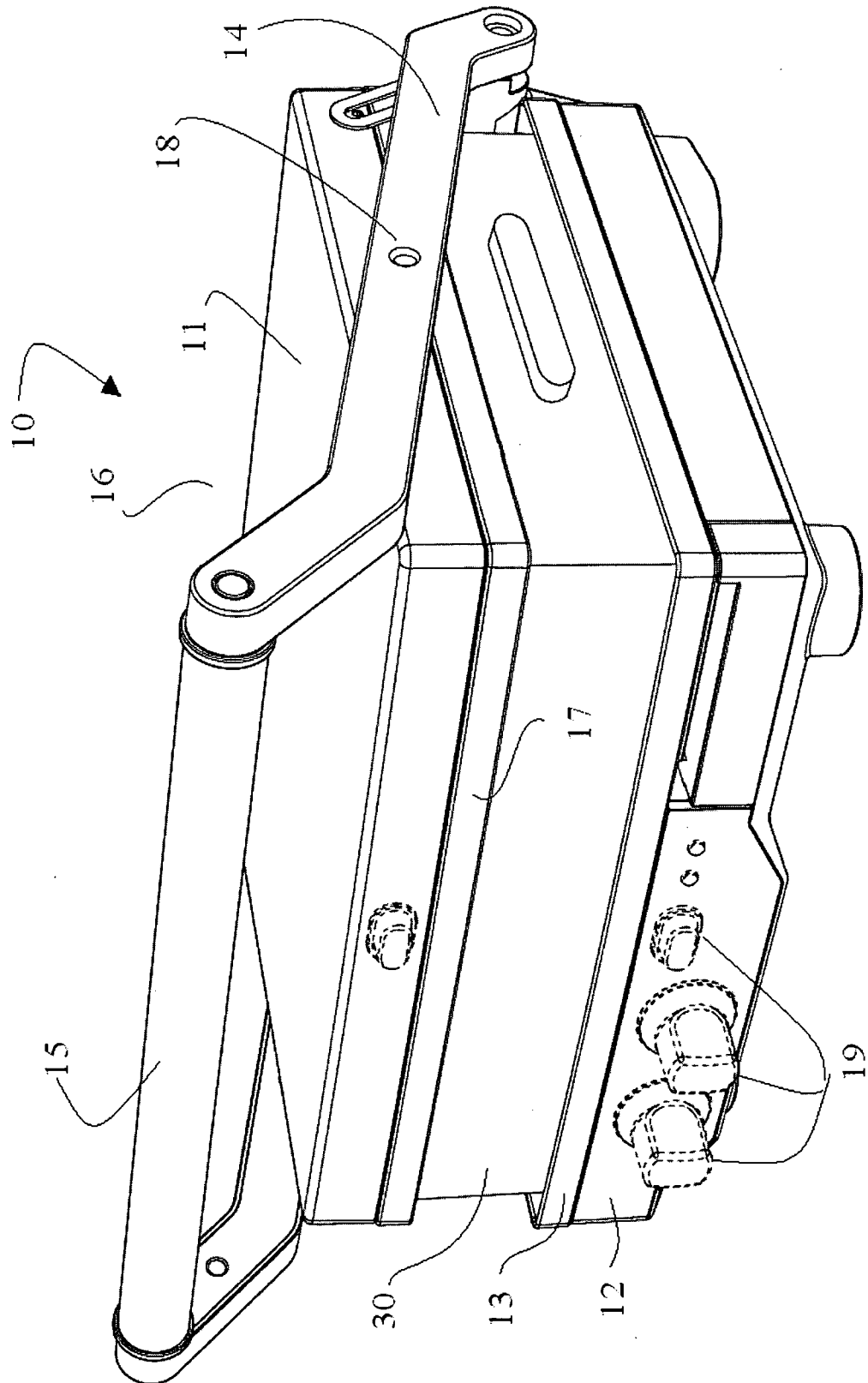


Fig. 1

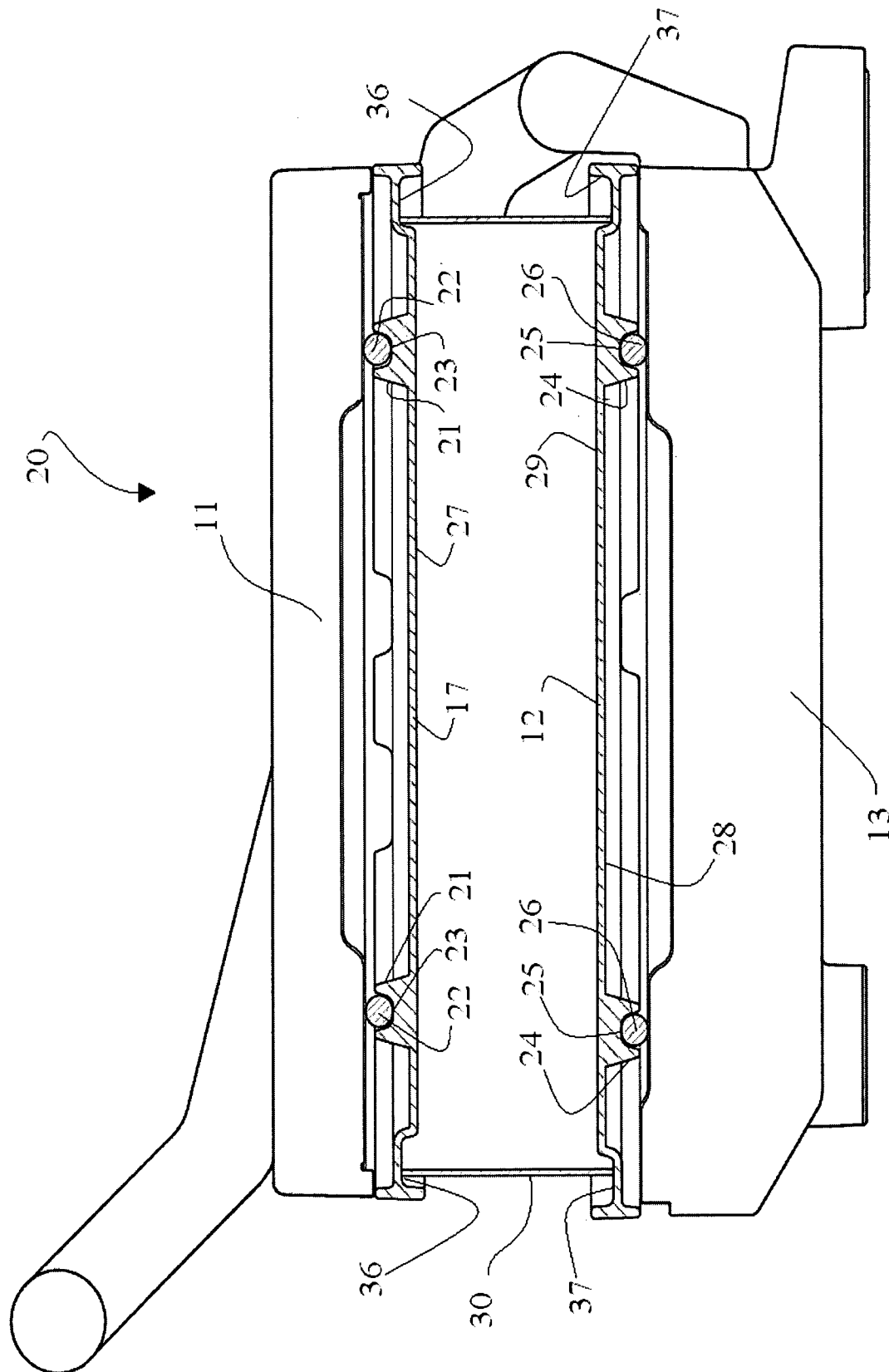


Fig. 2

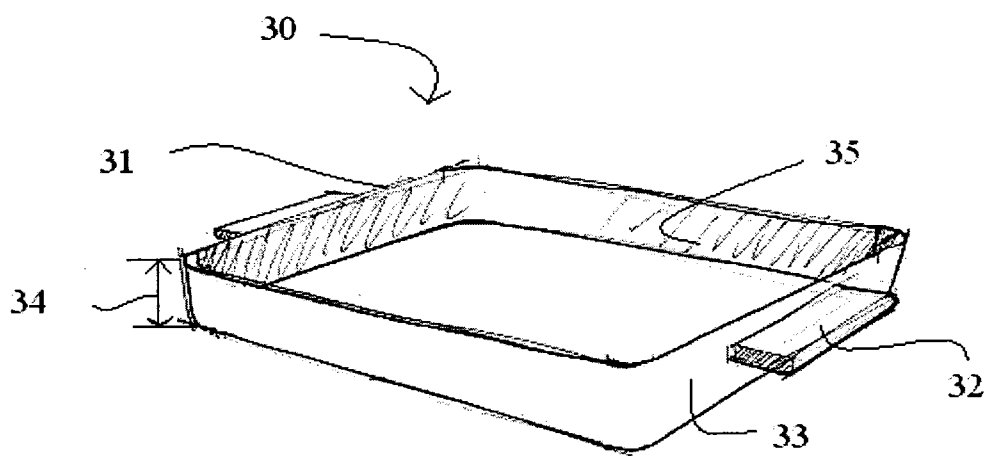
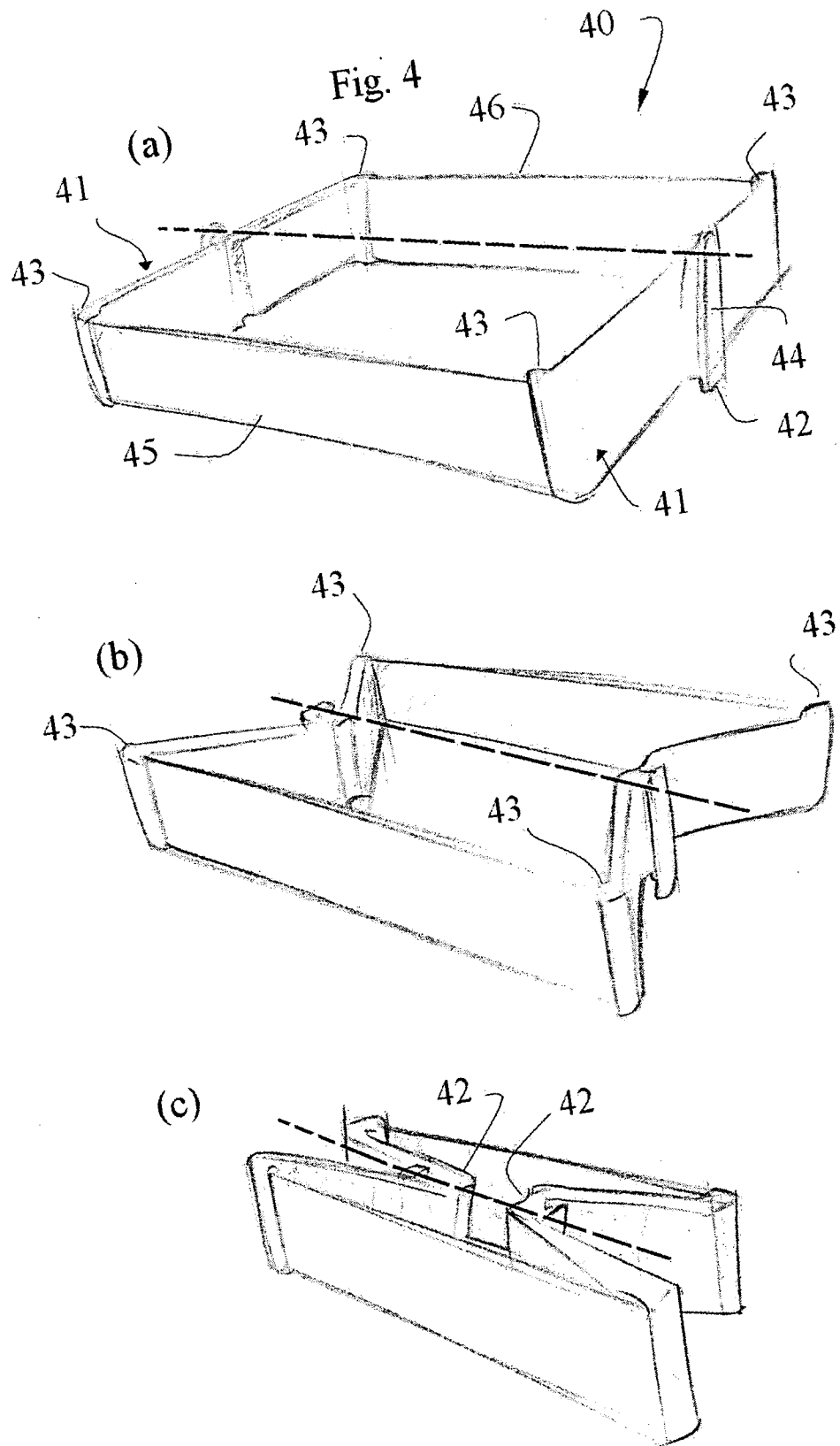


Fig. 3



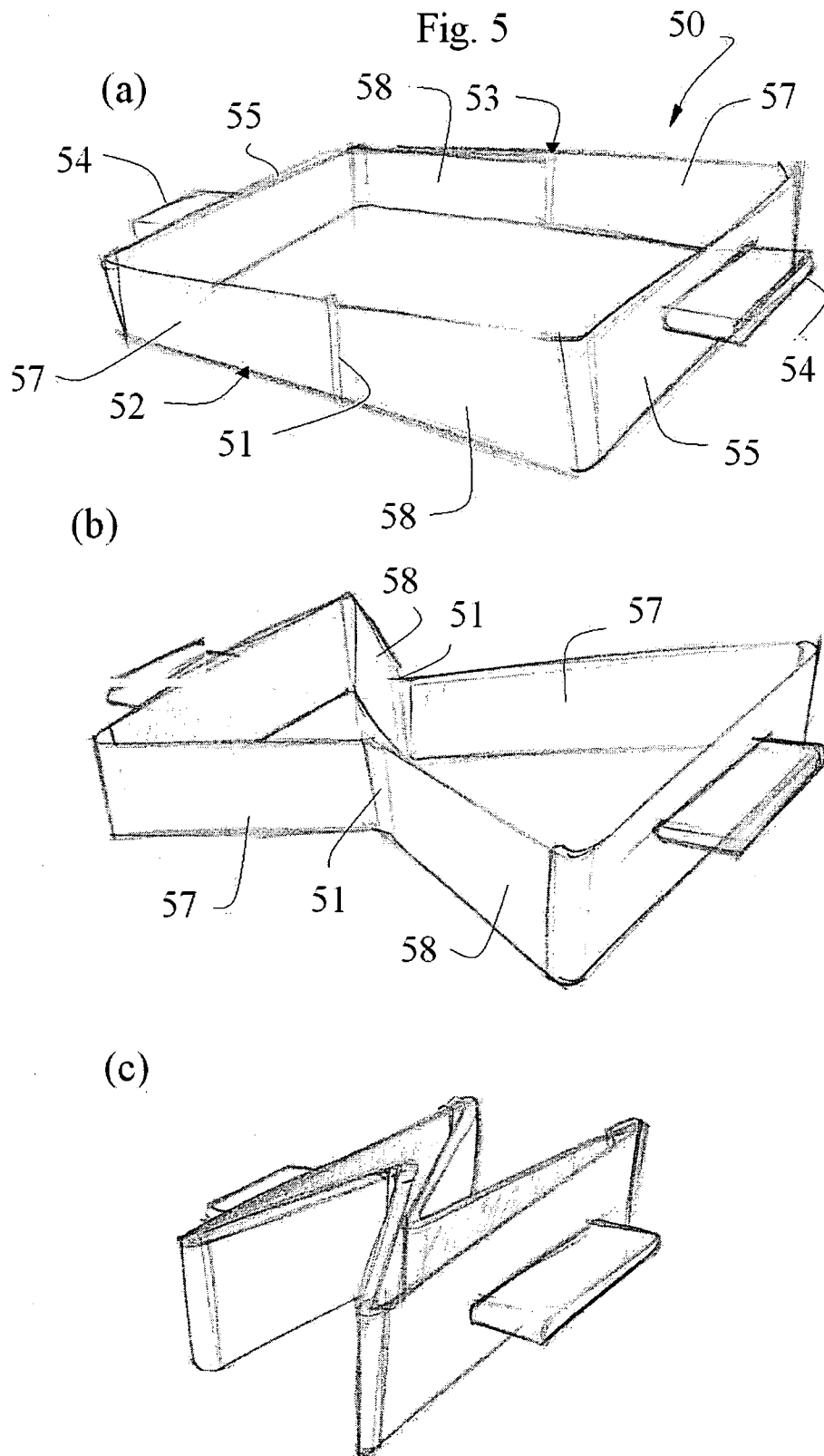
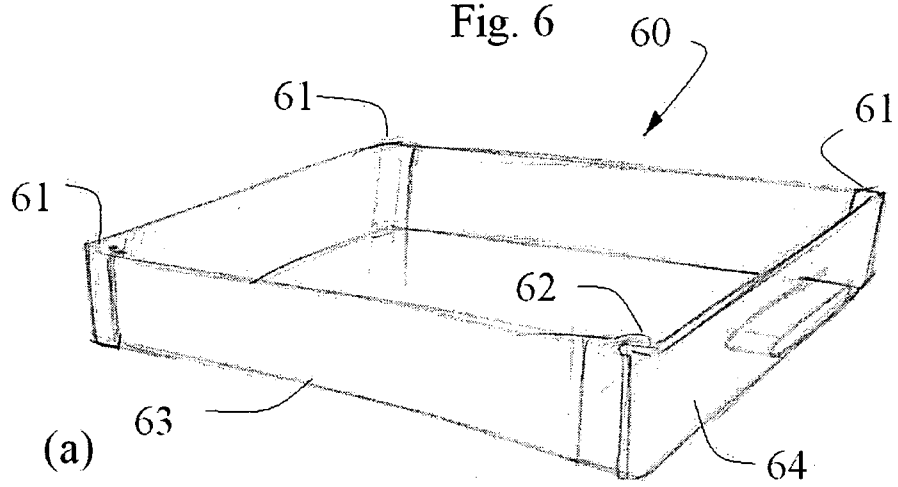
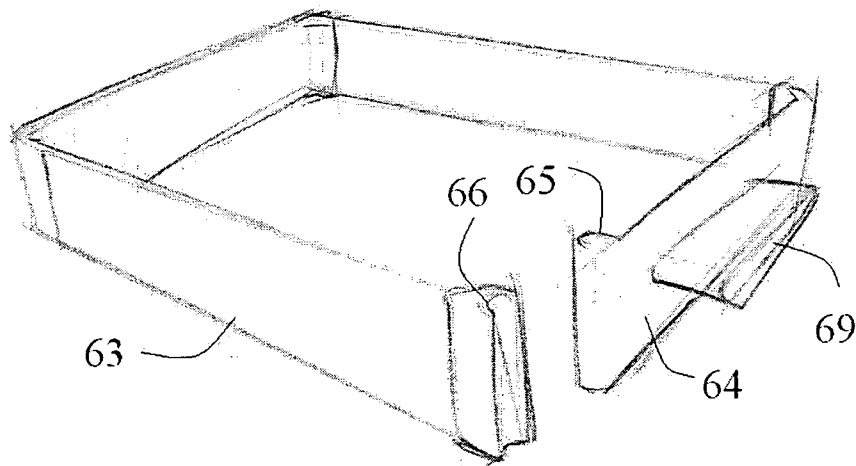


Fig. 6



(b)



(c)

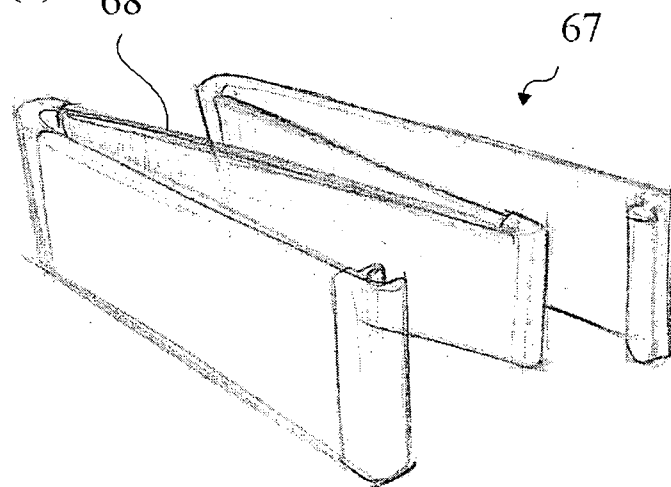
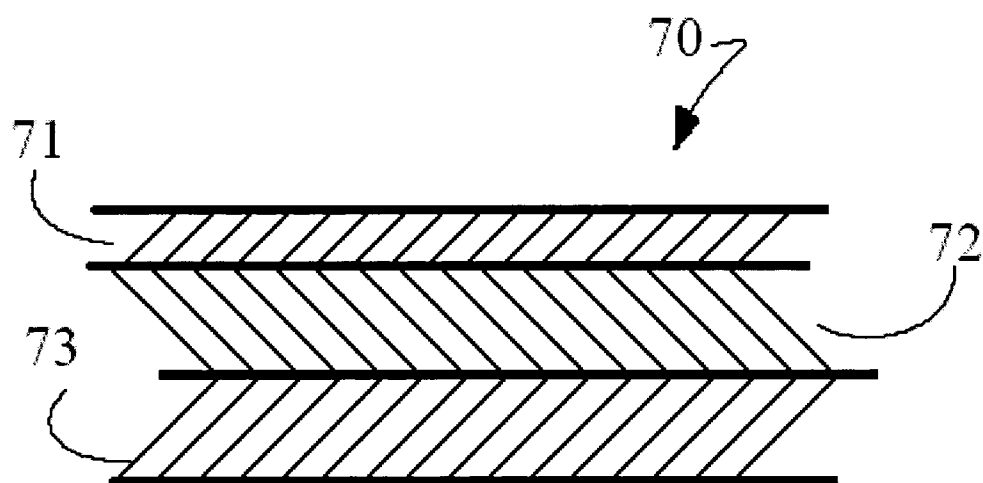


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2007/001454

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. A47J 37/00 (2006.01) A47J 37/04 (2006.01) A47J 37/06 (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) DWPI- IPC A47J037/00,037/04,037/06 & Keywords Chrom+ (Chrom+ & (Coat+ orsurface+) and (Heat+ or Electric+ Or grill+)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Derwent Abstract Accession No. 2005-3745524/39, Class P28, FR2862512 A1 (OPUS) 27 MAY 2005, See Abstract & Figs.	1
X	Derwent Abstract Accession No. 2005-581945/59, Class L02 M13, US2005186343 A1(GE M M H) 25 AUGUST 2005, See Abstract & Figs.	1
X	Derwent Abstract Accession No. 44417 k/19, Class P28, DE3142312 (DEGUSSA AG) 5 MAY 1983, See Abstract & Figs.	1
A	Derwent Abstract Accession No. 2005-075632/08, Class A84 D11, WO2005002342 A1 (FORSSTROEMS INNOVATIVE PROD AB) 13 JANUARY 2005, See Abstract & Figs.	1-20
☒ 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 application or patent 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 24 December 2007		Date of mailing of the international search report 7 - JAN 2008
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. +61 2 6283 7999		Authorized officer BANDULA RAJAPAKSE AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No : (02) 6283 2120

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2007/001454

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Derwent Abstract Accession No. 2001-191126/19 , Class M13 , US6197438 B1 (FAULKNER R) 06 MARCH 2001 See abstract & Figs.	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2007/001454

This Annex lists the known "A" publication level 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.

Patent Document Cited in Search Report		Patent Family Member			
US	6197438				
WO	2005002342	AU	2003245218	EP	1648235
DE	3142312				
US	2005186343	CA	2513911	CN	1751135
		US	6906295	US	2004166378
				EP	1597406
				WO	2004074538
FR	2862512	EP	1595970	FR	2862511
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.					
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