

(19) World Intellectual Property Organization
International Bureau



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

PCT

(10) International Publication Number
WO 2008/043155 A1

(51) International Patent Classification:
A01K 13/00 (2006.01) *A01K 1/03* (2006.01)

(21) International Application Number:
PCT/AU2007/001553

(22) International Filing Date: 15 October 2007 (15.10.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2006905670 13 October 2006 (13.10.2006) AU
2006905749 16 October 2006 (16.10.2006) AU

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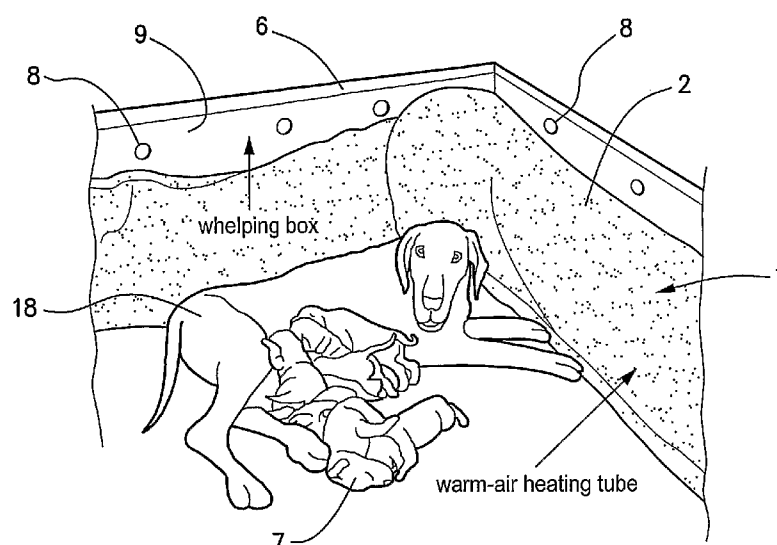
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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, 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).

Published:
— with international search report

(54) Title: ANIMAL WARMING APPARATUS AND METHOD



(57) Abstract: The present invention discloses an apparatus for keeping young animals warm, in the absence of their mother, for example. A warm air channel is provided by a pervious envelope which has a warm air feed to it. The envelope is placed in a container or housing for receiving the animals, e.g. a whelping box for puppies. The animals may move to the warm air envelope in order to receive warm air.

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ANIMAL WARMING APPARATUS AND METHOD

Field of the Invention

The present invention relates to an animal warming apparatus and method, and, particularly, but not exclusively, to an apparatus and method for warming young animals.

Background of the Invention

Animals, particularly young animals, require warmth. Small animals have a relatively large surface to volume ratio, which makes them particularly susceptible to hypothermia. Young animals, such as pups and kittens, are nursed by their mothers for the first 4 to 6 weeks of life. During periods of body contact with their mother, they maintain body warmth. There are times when the mother will need to leave her young, however, such as when she needs to feed. This can result in potential danger to one or more of the young (particularly the smaller or weaker of the young), as they may lose warmth and potentially face hypothermia if left for too long and/or rejected by other young, or debilitated neonates are at additional risk of hypothermia due to their inability to maintain heat through shivering. There are circumstances, such as follow caesarean section, where the mother may not be able to nurse or lay with the young. Alternative sources of warmth are required.

In dogs and cats, it is common for enclosures to be provided for the mother and her young animals. In dog and cat breeding for example, an enclosure may be provided which includes walls of a height that allows the mother to come and go from the enclosure, but the young are unable to climb the walls. The mother can thus leave at any time, potentially putting the young in danger of getting cold and even (in the worst cases) hypothermic.

Summary of the Invention

In accordance with a first aspect, the present invention provides an apparatus for warming an animal, comprising a warm air channel arranged to be supplied with warm air and positionable to provide warm air to the animal.

In an embodiment, the warm air channel is positionable within an enclosure for the animal.

In an embodiment, the warm air channel is provided by an envelope enclosing a space arranged to receive the warm air.

In an embodiment, the envelope is of a porous material, so that warm air may be received outside the envelope.

5 In an embodiment, where the warm air channel is positionable within an enclosure for the animal, the enclosure is provided with fastening means arranged to fasten the envelope to walls of the enclosure.

In an embodiment, the envelope is provided with complimentary fastening means.

10 In an embodiment, the apparatus further comprising a warm air heater for providing warm air to the warm air channel.

In accordance with a second aspect, the present invention provides a system for warming an animal, comprising an enclosure for receiving the animal and an apparatus in accordance with the first aspect of the invention.

15 In an embodiment, the enclosure includes fastening means for securing the warm air channel.

In an embodiment, the fastening means are provided on one or more inner walls of the enclosure.

In an embodiment, the enclosure is an enclosure for young animal.

20 In an embodiment, the enclosure is a whelping box for pups.

Advantageously, in at least an embodiment of the invention, young animal can be kept warm in an enclosure, even when their mother is absent.

A warm air channel provides warm air to the enclosure and the young animal can move towards the warm air channel when their mother is absent, in order to keep
25 warm. Where the warm air channel is provided by an envelope, the small animal can position themselves next to or underneath the envelope.

Where the envelope is porous, this will result in the animal being bathed in warm air.

Cold can reduce well being, growth rate and can even lead to animal death in
30 some cases. At least in an embodiment, the present invention prevents these affects.

The invention may be useful for all types of animals, including puppies. The invention may have particular application for dog and cat breeding.

In accordance with a third aspect, the present invention provides a method of

keeping a small animal warm, comprising the steps of providing warm air within a warm air channel to warm the animals.

In an embodiment, the warm air channel is provided within an enclosure for the animal.

5 In an embodiment, the animal is a young animal.

In an embodiment, the enclosure is a whelping box for puppies.

In an embodiment, the warm air channel is provided by an envelope enclosing a space arranged to receive the warm air.

In an embodiment, the envelope is of a porous material.

10 In an embodiment, the envelope forms a tube of material.

As well as keeping animals warm, it may also be important in some circumstances to be able to cool animals, particularly in hot climates. This may be important for old, ill or otherwise infirm animal who has difficulty keeping themselves cool and indeed may risk hyperthermia.

15 In accordance with a fourth aspect, the present invention provides an apparatus for providing conditioned air to an animal, comprising an air channel arranged to be supplied with conditioned air and positionable to provide the conditioned air to the animal.

20 In an embodiment the conditioned air may be cooled air, suitable for cooling an animal or animals who require cooling.

In an embodiment, the air channel is provided by an envelope enclosing a space arranged to receive the conditioned air.

25 This aspect of the invention may have any or all of the features of the above aspects of the invention, except that the air is conditioned air (which may be cool, as well as warm).

This embodiment of the invention has the advantage that it may provide a convenient way for keeping animals cool.

30 In accordance with a fifth aspect, the present invention provides a system for providing conditioned air to animals, comprising an enclosure for receiving an animal and an apparatus in accordance with the fourth aspect of the invention.

In an embodiment, the enclosure includes fastening means for securing the warm air channel.

In accordance with a sixth aspect, the present invention provides a method of

keeping an animal cool, comprising the steps of providing cool air within a air channel to cool the animal.

In an embodiment, the air channel is provided within an enclosure for the animal.

- 5 In an embodiment, the air channel is provided by an envelope enclosing the space arranged to receive the cool air.

In an embodiment, the envelope is of a porous material.

In an embodiment, the envelope forms a tube of material.

10 Brief Description of the Drawings

Features and advantages of the present invention will become apparent from the following description of embodiments thereof, by way of example only, with reference to the accompanying drawings, in which;

Figure 1 is a diagram illustrating an embodiment of the present invention in operation;

- 15 Figure 2 is a plan view of the embodiment of Figure 1, and

Figure 3 is a view of an envelope for providing a warm air channel, in accordance with an embodiment of the present invention.

Detailed Description of Preferred Embodiments

- 20 Referring to the Figures, an apparatus in accordance with an embodiment of present invention is illustrated. The apparatus includes a warm air channel 1 which is arranged to deliver warm air for keeping young animals warm. In this embodiment, the warm air channel 1 is provided by a porous, tubular envelope 2. In this example, the envelope 2 is of porous polypropylene.

- 25 In this embodiment, the apparatus also includes a heating unit 3 which is connected by a conduit 4 to one end of the envelope 2. The heating unit 3 is arranged to heat air to a range of temperatures (suitable for different types of animals), in this example up to 46 degrees Celsius.

- The heating unit 3 also includes a pressure sensor for sensing back pressure on
30 the warm air delivery port 5. When an envelope 2 is attached, there will be a certain amount of back pressure on the delivery port. When this back pressure is detected, air may be delivered safely. This prevents warm air being delivered from the delivery tube 5 directly onto an animal for example, which could cause burning. The back pressure

showing that the envelope is attached must be detected before warm air can be delivered.

In this embodiment, the envelope 2 is mounted within an enclosure 6 for the animals. In this embodiment, the enclosure is a whelping box for puppies 7. Fastening means 8 are provided within the whelping box 6, in order to secure the envelope 2 to the inner walls 9 of the whelping box 6. The fastening means may be hooks which are arranged to receive corresponding eyes of material provided on the envelope 2. Other fastening means could be used (such as, for example, buttons and corresponding button holes in the envelope 2). Fastening the envelope 2 to the inner walls 9 of the whelping box 6 prevents the young animals from moving the envelope 2 about the enclosure 6.

In this embodiment, the envelope 2 is a simple tube of material. It is open at either end 10, 11, until secured by a clip 12 at one end and a clamp 13 at the other end clamping the end 11 about the conduit 4 from the heating unit 3.

As the envelope 2 is a simple tube, it can be manufactured as a long length of material and sectioned to provide tubes of the desired length for warming an enclosure. A simple clip or even stapling can be used to secure the end 10 distal from the heating unit 3. A simple clamp mechanism 13 can be used to secure the end 11 to the heating unit 3 conduit 4. The envelope is expected to be disposable, as it is likely to become dirty quite quickly (although in an embodiment the surface of the material may be treated so that dirt and debris slides off the surface).

The envelope may be substantially porous over its entire surface area. In an alternative embodiment, the envelope may be made from two layers of material secured together, one being non porous and the other being porous. In use, the non porous side of the envelope 2 is placed against the inner wall of the enclosure, so that the porous side is exposed to the animals.

As well as polypropylene, the envelope 2 could be of any convenient material, including porous polyester.

The heating unit 3 includes control and selection means 14, 15, 16 (16 being a display, and 14 & 15 being temperature selection controls) that enable the selection of a variety of temperatures for the warmed air. In this embodiment warmed air can be delivered with temperatures arranged from 20 through to 46 degrees centigrade. It may include temperatures of 25, 30, 34, 37, 40, 43 or 45 degrees centigrade. The heater unit 3 is therefore appropriate for a number of different types of animals that may have

different warming requirements.

In operation, heat is provided to the channel 1 via the envelope 2, from the heating unit 3. When the mother 18 leaves the puppies, for example, the puppies can crawl to the envelope 2 and receive warm air, in order to maintain their body heat.

5 In the above embodiment, the envelope 2 is shown extending along two sides of the enclosure 6. It could extend along three or four sides of the enclosure 6 or just one side of the enclosure, depending upon requirements.

The above embodiment discloses the use of an enclosure which is a similar type of enclosure that can be used as a whelping box for puppies. The invention is not
10 limited to the use of this type of enclosure. Other enclosures that may benefit from installation of such an arrangement include anywhere where animals can be housed, such as kennels, catteries, veterinary cages, and other enclosures.

In the above embodiment, the invention is shown being applied for use with puppies. Although useful for keeping puppies warm, the present invention is not
15 limited to puppies. The invention may also be used with other young animals, such as kittens, and small animals such as mice, and other animals. It is also not limited for use with young animals. It may be useful for infirm, old and weak animals, such as geriatric dogs, cats and other animals.

In the above embodiment, the air is provided via a porous envelope. In an
20 alternative embodiment, the envelope may be of impervious material, with a number of small holes provided in it. The envelope may be pervious in any way.

In the above embodiment, warm air is provided to keep the animals warm. In an alternative embodiment, it may be useful to provide cool air. In this embodiment, the same apparatus as described above in relation to the above embodiment is utilised
25 except the warm air providing unit is replaced by an air conditioning unit to provide the air to the envelope. The air conditioning unit can provide cool air. This may be useful for, for example, animals that cannot self regulate their temperature, old and infirm animals, and other animals that may require cooling.

The above embodiments of the invention may be useful for single animals, as
30 well as a plurality of animals.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly

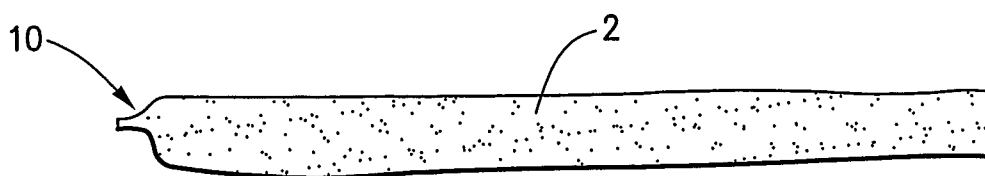
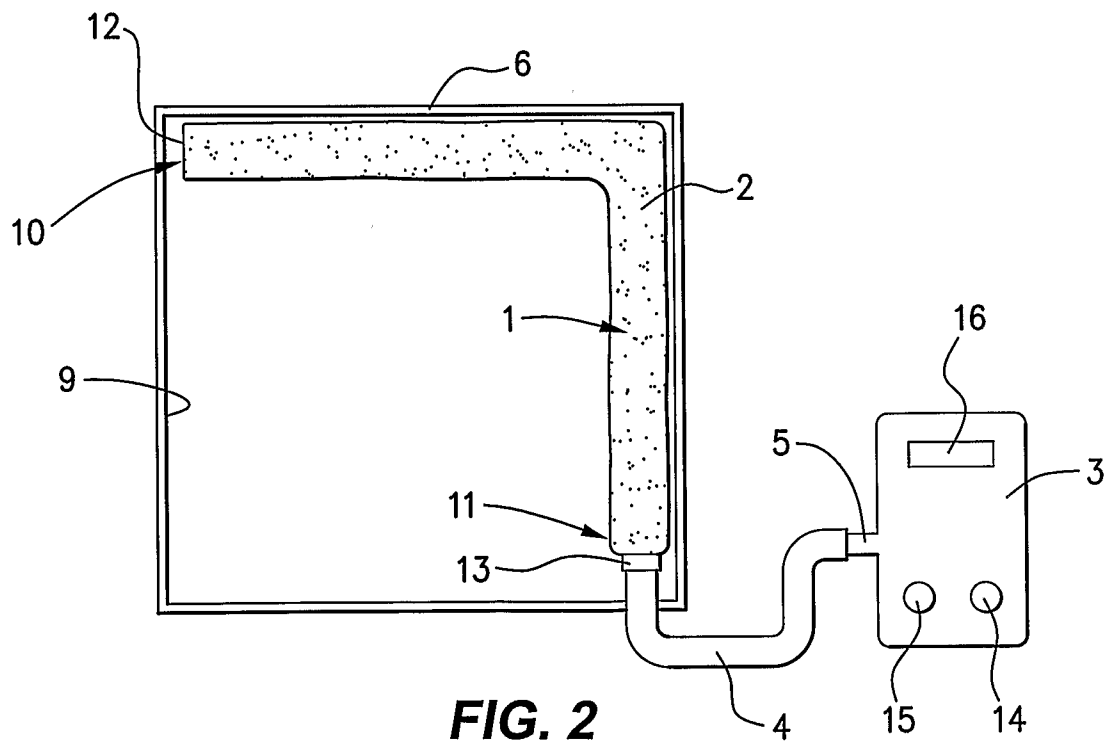
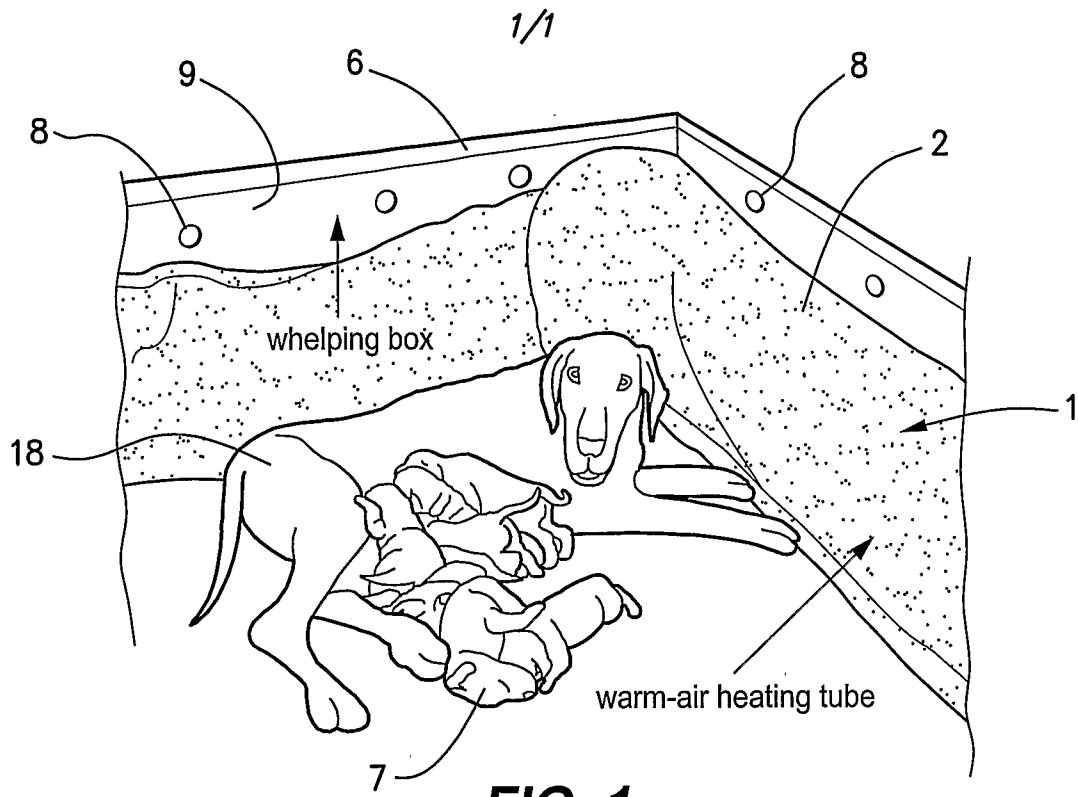
described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

In the claims which follow and in the preceding description of the invention, except where the context requires otherwise due to express language or necessary
5 implication, the word "comprise" or variations such as "comprises" or "comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An apparatus for warming animals, comprising a warm air channel arranged to be supplied with warm and positionable to provide warm air to the animals.
- 5 2. An apparatus in accordance with Claim 1, the warm air channel being positionable within an enclosure for the animals.
3. An apparatus in accordance with Claim 2, wherein the enclosure is an enclosure for infant animals.
4. An apparatus in accordance with Claim 3, wherein the enclosure is a whelping box.
- 10 5. An apparatus in accordance with any one of the preceding claims, wherein the warm air channel is provided by an envelope enclosing a space arranged to receive the warm air.
6. An apparatus in accordance with Claim 5, wherein the envelope is of a porous material.
- 15 7. An apparatus in accordance with Claim 5 or Claim 6, wherein the envelope includes fastening means for fastening it in position.
8. An apparatus in accordance with any one of the preceding claims, further comprising a warm air heater for providing air to the warm air channel.
- 20 9. A system for warming animals, comprising an enclosure for receiving the animals and an apparatus in accordance with any one of Claims 1 to 8.
10. An apparatus in accordance with Claim 9, wherein the enclosure includes fastening means for securing the warm air channel.
11. An apparatus in accordance with Claim 10, wherein the fastening means are provided on one or more inner walls of the enclosure.
- 25 12. An apparatus in accordance with any one of Claims 9 to 11, wherein the enclosure is an enclosure for young animals.
13. An apparatus in accordance with Claim 12, wherein the enclosure is a whelping box for pups.
- 30 14. A method of keeping small animals warm, comprising the steps of providing warm air within a warm air channel to warm the animals.
15. A method in accordance with Claim 13, wherein the warm air channel is provided within an enclosure for the animals.

16. An apparatus in accordance with Claim 13 or Claim 14, wherein the animals are young animals.
17. An apparatus in accordance with Claim 14, wherein the enclosure is a whelping box for puppies.
- 5 18. An apparatus in accordance with any one of Claims 13 to 17, wherein the warm air channel is provided by an envelope enclosing a space arranged to receive the warm air.
19. A method in accordance with Claim 17, wherein the envelope is of a porous material.
- 10 20. An apparatus for providing conditioned air to animal, comprising an air channel arranged to be supplied with conditioned air and positionable to provide the conditioned air to the animal.
21. A system for providing conditioned air to animals, comprising an enclosure for receiving an animal and an apparatus in accordance with claim 20.
- 15 22. A method of keeping an animal cool, comprising the steps of providing cool air within an air channel to cool the animal.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2007/001553

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

A01K 13/00 (2006.01) A01K 1/03 (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 with IPC A01K/ic, F24F/ic, A61D/ic, B65D 85/50, and keywords (warm, air, channel, porous) & like terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4947799 A (PARKER) 14 August 1990 Entire document	1-22
X	Patent Abstracts of Japan, JP 10-004813 A (SUGAHARA KIKO:KK) 13 January 1998 Abstract; English translation from JPO site; drawings	1-22
X	EP 1652425 A1 (HEBLA S.A.S DI GHERSETTI MANLIO & C.) 3 May 2006 Entire document	1-22



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:

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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

"E" earlier application or patent but published on or after the international filing date

"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

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Date of the actual completion of the international search
07 December 2007

Date of mailing of the international search report

13 DEC 2007

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2007/001553

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5216977 A (ALLEN, Jr) 8 June 1993 Entire document	1-5, 7-18, 20-22
X	GB 2135442 A (HOWORTH AIR ENGINEERING LIMITED (UNITED KINGDOM)) 30 August 1984 Entire document	1-22
X	US 5140947 A (BRUCE) 25 August 1992 Entire document	1, 5, 7-10, 12-14, 16-18, 20-22
X	US 6560779 B1 (SAVAGE et al) 13 May 2003 Entire document	1-22
X	Patent Abstracts of Japan, JP 11-318255 A (DAIDAN KK) 24 November 1999 Abstract; English translation from JPO site; drawings	1-22

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2007/001553

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	4947799	US	5067444
JP	10004813	NIL	
EP	1652425	NIL	
US	5216977	NIL	
GB	2135442	NIL	
US	5140947	CA	2076739
US	6560779	NIL	
JP	11318255	NIL	
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			
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