



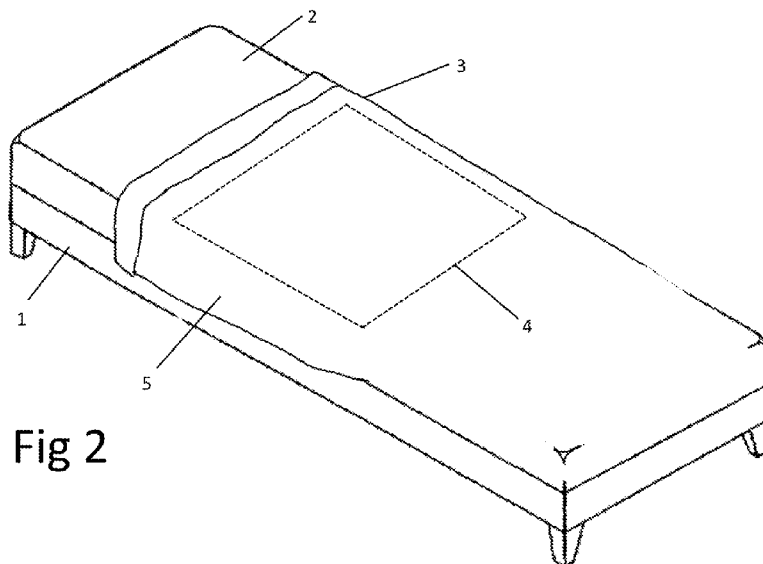
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(54) **Title:** BEDSHEET MOISTURE PROTECTION



**Fig 2**

(57) **Abstract:** The invention provides a method and apparatus for bedsheets moisture protection. The apparatus comprises an upper bedsheets (3) comprising an inner portion (4) extending in use over a moisture producing region of the person, the inner portion being disposed within an outer portion (5) surrounding the inner portion, wherein the inner portion (4) comprises a moisture absorbent layer (9) adapted to absorb moisture from below, and a water impermeable layer (8) disposed above the moisture absorbent layer (9); and the outer portion (5) has a non-wicking property such that moisture absorbed into the moisture absorbent layer (9) of the inner portion (4) does not migrate into the outer portion (5). The method comprises placing the upper bedsheets (3) over the person in the bed.



## BEDSHEET MOISTURE PROTECTION

### FIELD

[0001] The present invention relates to moisture retention aids for protecting beds and bedding, in particular to an upper bedsheet having improved moisture retention properties and a method incorporating same.

### BACKGROUND

[0002] Bedwetting is a perennial problem for people of very young or old age and for people with a disability or temporary ailment. Many types of bedding protection are known, mostly focused on bed mattress protectors which are disposed beneath the patient which comprise a water impermeable layer that prevents moisture from the patient wetting the mattress. The upper bedsheet component of bedding which lies above the patient has received little innovative attention. Without any moisture protection, upper bedsheets tend to absorb moisture and become soaked throughout, causing moisture to wet bedclothes or to migrate to the floor. Even with an upper bedsheet constructed with water impermeable layer, existing moisture protecting upper bedsheets have a water impermeable layer over the entire extent of the bedsheet resulting in migration of moisture through the moisture absorbent layer at least to the floor.

[0003] Also, similar problems exist with people suffering from severe night perspiration.

[0004] There is therefore a need to provide an improved upper bedsheet incorporating moisture protection which overcomes the above-mentioned disadvantages.

## SUMMARY OF THE INVENTION

[0005] According to a first broad aspect of the invention there is provided an upper bedsheet adapted to be placed above a person in a bed, the upper bedsheet comprising an inner portion extending in use over a moisture producing region of the person, the inner portion being disposed within an outer portion surrounding the inner portion, wherein

the inner portion comprises a moisture absorbent layer adapted to absorb moisture from below, and a water impermeable layer disposed above the moisture absorbent layer; and

the outer portion has a non-wicking property such that moisture absorbed into the moisture absorbent layer of the inner portion does not migrate into the outer portion.

[0006] In one embodiment, wherein the outer portion comprises a non-wicking fabric. The non-wicking fabric of the outer portion may extend over an upper surface of the inner portion. The moisture absorbent layer and the water impermeable layer may be attached to the non-wicking fabric at least at a boundary of the inner portion. The non-wicking fabric may comprise nylon or a hydrophobic polyester.

[0007] In one embodiment, the moisture absorbent layer is laminated to the water impermeable layer.

[0008] In one embodiment, the moisture absorbent layer is a towelling material.

[0009] In one embodiment, at least the moisture absorbent layer is disposable.

[0010] In accordance with a second broad aspect of the invention there is provided a method of protecting a bed or bedding from moisture, the method comprising the steps of:

providing an upper bedsheet adapted to be placed over a person in the bed, the upper bedsheet comprising an inner portion extending in use over a moisture producing region of the person, the inner portion being disposed within an outer portion extending around the inner portion, wherein the inner portion comprises a moisture absorbent layer adapted to absorb moisture from below, and a water impermeable layer disposed above the moisture absorbent layer; and the outer portion has a non-wicking property such that moisture absorbed into the moisture absorbent layer of the inner portion does not migrate into the outer portion; and

placing the upper bedsheet over the person in the bed.

[0011] In one embodiment, the method further comprises the step of also providing a water impermeable mattress protector adapted to be disposed under the person in the bed.

[0012] In both aspects of the invention, the moisture producing region may be a central torso region appropriate for containment of urination.

#### BRIEF DESCRIPTION OF DRAWINGS

[0013] Figure 1 is a perspective view of a bed and mattress;

[0014] Figure 2 is a perspective view of the bed and mattress of Figure 1 with a bedsheet according to an embodiment of the invention fitted thereto;

[0015] Figure 3 is a plan view of the bedsheet of Figure 2; and

[0016] Figure 4 is a cross-sectional side view of the bedsheet of Figure 2 through line A-A.

#### DETAILED DESCRIPTION OF EMBODIMENTS

[0017] An embodiment of the current invention will now be described.

[0018] Referring first to Figure 1, a bed base 1 and mattress 2 is shown. Mattress 2 may be fitted with a water impermeable mattress protector such as is known in the prior art in order to provide protection from moisture ingress into mattress 1. Such mattress protectors typically include a moisture absorbent layer disposed above a water impermeable layer, which may be laminated together and formed into an elastic fitment arrangement to be held in place on top of mattress 2.

[0019] Referring now to Figure 2, an upper bedsheet 3 according to an embodiment of the invention is shown fitted to mattress 2. Upper bedsheet 3 is adapted to be placed over the person sleeping in the bed and comprises an inner portion 4 depicted by dashed lines denoting the boundary thereof surrounded by an outer portion 5. Inner portion 4 is sized, shaped and positioned appropriately to extend in use over a central torso region of the person likely to cover moisture from urination. Outer portion 5 comprises a remainder of the area of bedsheet 3.

[0020] Referring now to Figure 3, a plan view of rectangular flat bedsheet 3 is shown showing rectangular inner portion 4

positioned within outer portion 5. For a typical single bedsheet of width 1800 mm and length 2600 mm, the central portion is conveniently about 900 mm wide and 1000 millimetres long, but it will be appreciated that many variations in dimension and shape are possible to provide useful coverage of a source of urination. When the invention is applied in other purposes such as night perspiration, the length is conveniently about 1900 mm to cover substantially the entire body of the person. Importantly, outer portion 5 surrounds inner portion 4.

[0021] Referring now to Figure 4, a cross-sectional view through line A-A shown in Figure 3 is depicted. In this embodiment, the upper bedsheet 3 is conveniently constructed using a rectangular sheet with non-wicking properties forming both the outer portion 5 and an upper surface 7 of inner portion 4. A suitable material of non-wicking properties includes a nylon or hydrophobic polyester fabric. Inner portion 4 comprises a moisture absorbent layer 9 such as a towelling material laminated to a water impermeable layer 8 such as polyurethane, as is known in the art for mattress protectors. Inner portion 4 is attached to the non-wicking fabric 5,7 through stitching 10 around a boundary.

[0022] In use, moisture is absorbed into moisture absorbent layer 9 but resists extending outside the inner portion 4 by the outer portion 5 which surrounds the inner portion 4, by virtue of the non-wicking properties of outer portion 5. In this way, the person is kept relatively dry by absorption of the moisture into the moisture absorbent layer 9, and wetting of the blankets or dripping onto the floor is prevented as moisture is inhibited from soaking past the boundary with the outer portion 5.

[0023] Persons skilled in the art will also appreciate that many variations may be made to the invention without departing from the scope of the invention, which is determined from the

broadest scope and claims.

[0024] For example, any material with non-wicking properties is suitable for outer portion 5, and is not necessarily restricted to woven fabrics. Further, outer portion 5 must surround inner portion 4 but in the broadest aspect of the invention does not need to extend fully to the outer edge of the bedsheet 3, which could contain alternative materials without non-wicking property outside outer portion 5.

[0025] Further, while the example provided describes that the inner portion 4 is attached by stitching 10 around the boundary thereof to the outer portion 5, any mode of attachment including welding or removable attachment such as Velcro fastener or a sewn pocket is within the scope of the invention. A removable attachment embodiment would allow for the possibility of a disposable moisture absorbent layer construction, still within the broadest aspect of the invention.

[0026] Further still, while the example provided above describes that the bedsheet 3 is constructed from a non-wicking fabric which extends from the outer portion 5 over an upper surface 7 of the inner portion 4, it will be appreciated that the upper surface 7 within the boundary of the inner portion 4 is not necessary although it is desirable for aesthetic reasons and simplicity of construction.

[0027] 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 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. Further, any method steps recited in the claims are not necessarily intended to be performed temporally in the sequence written, or to be performed without pause once started, unless the context requires it.

[0028] It is to be understood that, if any prior art publication is referred to herein, such reference does not constitute an admission that the publication forms a part of the common general knowledge in the art, in Australia or any other country.

## CLAIMS

1. An upper bedsheet adapted to be placed above a person in a bed, the upper bedsheet comprising an inner portion extending in use over a moisture producing region of the person, the inner portion being disposed within an outer portion surrounding the inner portion, wherein

the inner portion comprises a moisture absorbent layer adapted to absorb moisture from below, and a water impermeable layer disposed above the moisture absorbent layer; and

the outer portion has a non-wicking property such that moisture absorbed into the moisture absorbent layer of the inner portion does not migrate into the outer portion.

2. The upper bedsheet of claim 1, wherein the outer portion comprises a non-wicking fabric.

3. The upper bedsheet of claim 2, wherein the non-wicking fabric of the outer portion extends over an upper surface of the inner portion.

4. The upper bedsheet of claim 3, wherein the moisture absorbent layer and the water impermeable layer are attached to the non-wicking fabric at least at a boundary of the inner portion.

5. The upper bedsheet of claim 1, wherein the moisture absorbent layer is laminated to the water impermeable layer.

6. The upper bedsheet of any one of claims 2 to 4, wherein the non-wicking fabric comprises nylon or a hydrophobic polyester.

7. The upper bedsheet of any one of claims 1 to 6, wherein the moisture absorbent layer is a towelling material.

8. The upper bedsheet of claim 1, wherein at least the moisture absorbent layer is disposable.

9. The upper bedsheet of claim 1, wherein the moisture

producing region is a central torso region.

10. A method of protecting a bed or bedding from moisture, the method comprising the steps of:

providing an upper bedsheet adapted to be placed over a person in the bed, the upper bedsheet comprising an inner portion extending in use over a moisture producing region of the person, the inner portion being disposed within an outer portion extending around the inner portion, wherein the inner portion comprises a moisture absorbent layer adapted to absorb moisture from below, and a water impermeable layer disposed above the moisture absorbent layer; and the outer portion has a non-wicking property such that moisture absorbed into the moisture absorbent layer of the inner portion does not migrate into the outer portion; and

placing the upper bedsheet over the person in the bed.

11. The method of claim 10, wherein the moisture producing region is a central torso region.

12. The method of claim 10, further comprising the step of also providing a water impermeable mattress protector adapted to be disposed under the person in the bed.

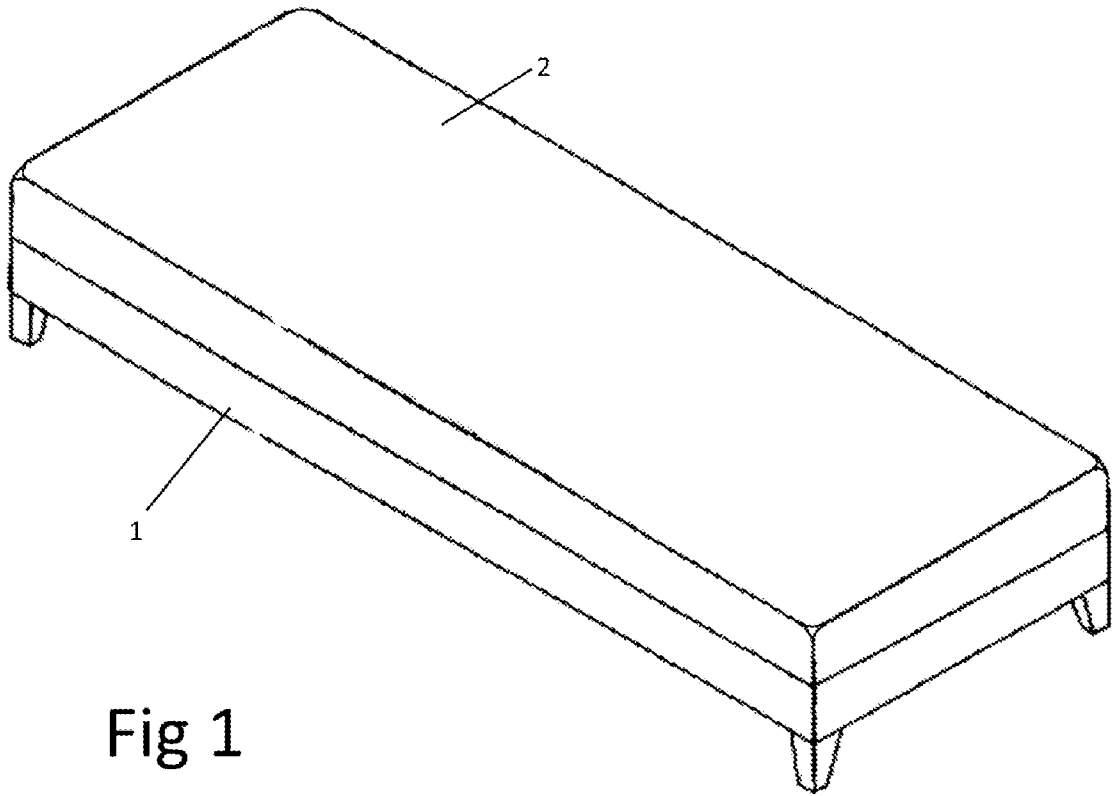


Fig 1

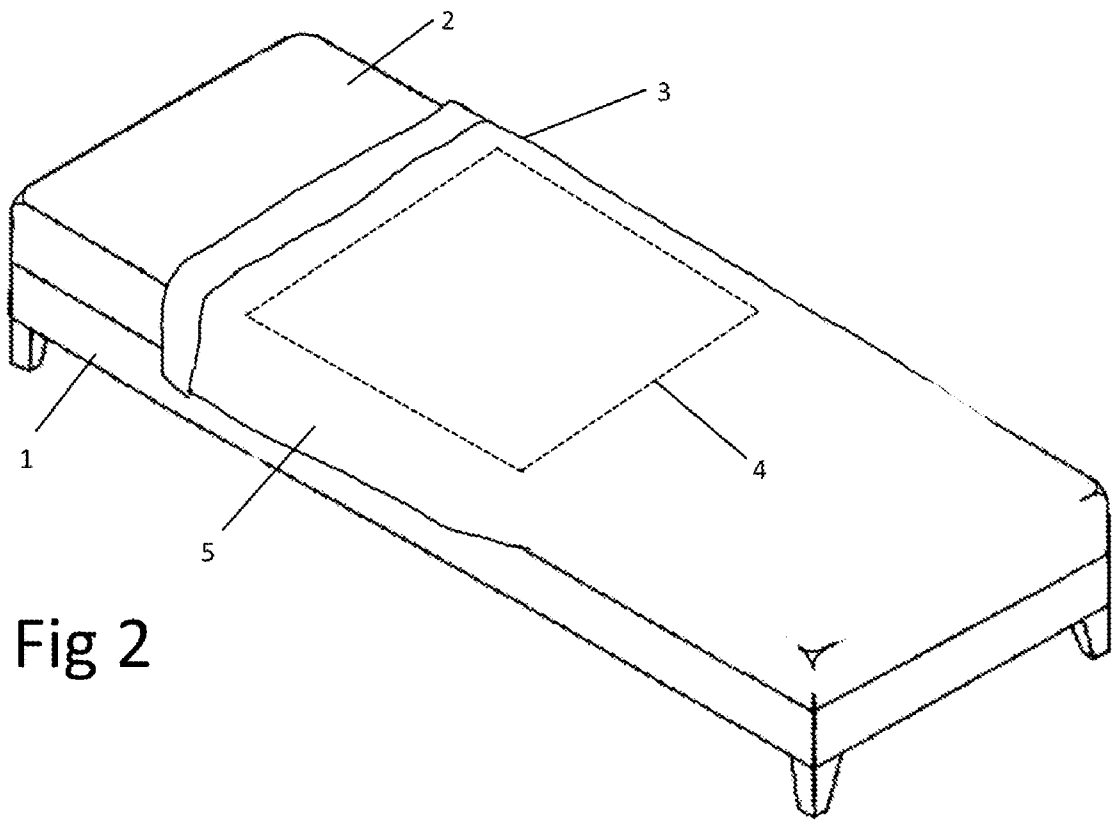


Fig 2

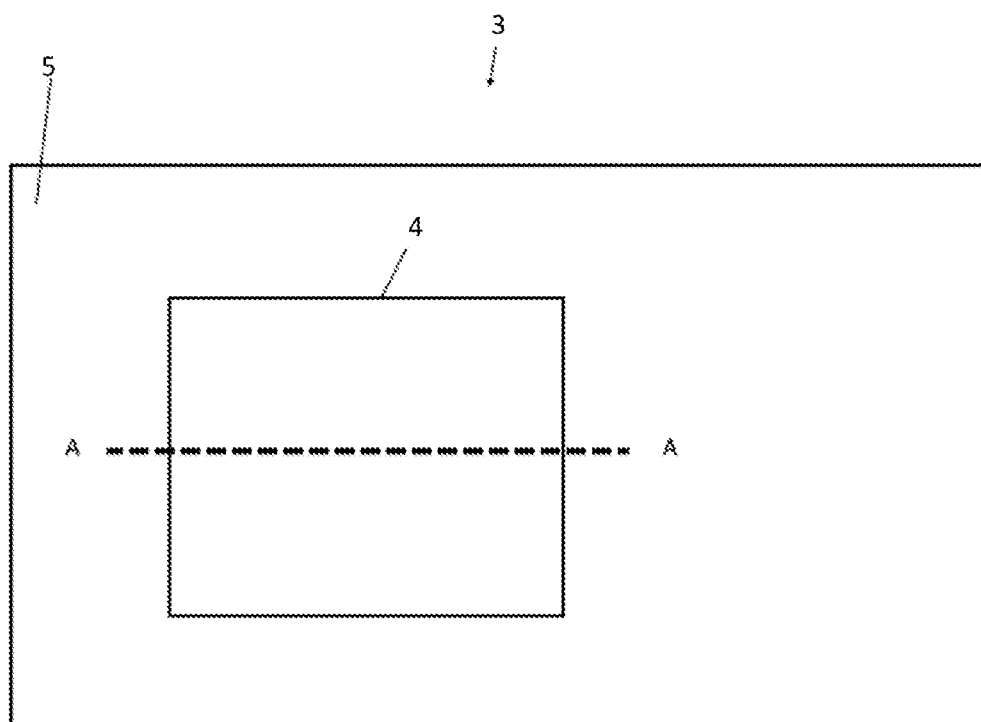


Fig 3

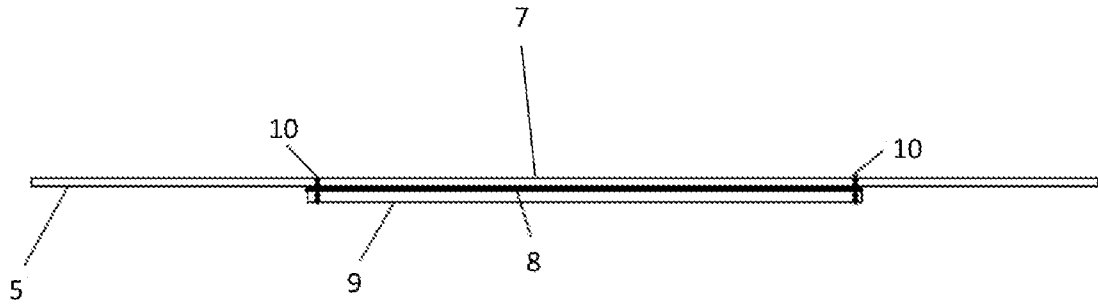


Fig 4

## A. CLASSIFICATION OF SUBJECT MATTER

**A47G 9/02 (2006.01)**

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

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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

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

EPODOC, WPIAP: CPC, IPC:A47G9/LOW, B32B2307/726/LOW, B32B5/22/LOW, B32B25/LOW/and Full Text Databases: TXPEA, TXPEB, TXPEC, TXPEE, TXPEF, TXPEH, TXPEI, TXPEP, TXPEPEA, TXPES, TXPUSE0A, TXPUSE1A, TXPUSEA, TXPUSEB, TXPW0EA, WPIAP, EPODOC.- &amp; Keywords: blankets, sheet, absorb, hydrophobic, impermeable, urine, sweat and other like terms.

Applicant/Inventor name "KAPLAN, David Michael" searched in EspaceNet and AusPat.

Google and Google Patent search with abovementioned keywords.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"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	
"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	
"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)	"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	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search  
3 April 2017Date of mailing of the international search report  
03 April 2017

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## INTERNATIONAL SEARCH REPORT

International application No.

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

**PCT/AU2017/050079**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1457192 A (GRIDEL) 01 December 1976 Figures, abstract, page 1 line 85 - page 3 line 35	1 - 12
X	US 5701617 A (COLBY) 30 December 1997 Figures, column 4	1 - 12
X	JP 2012090936 A (ITO) 17 May 2012 Figures, abstract, page 2	1 - 12
X	GB 2468685 A (APA PARAFRICTA LIMITED) 22 September 2010 Figures, abstract, page 2 lines 25 - 27	1 - 12

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/AU2017/050079**

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

<b>Patent Document/s Cited in Search Report</b>		<b>Patent Family Member/s</b>	
<b>Publication Number</b>	<b>Publication Date</b>	<b>Publication Number</b>	<b>Publication Date</b>
GB 1457192 A	01 December 1976	GB 1457192 A	01 Dec 1976
		BE 821232 A1	17 Feb 1975
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GB 2468685 A	22 September 2010	GB 2468685 A	22 Sep 2010

**End of Annex**

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2009)