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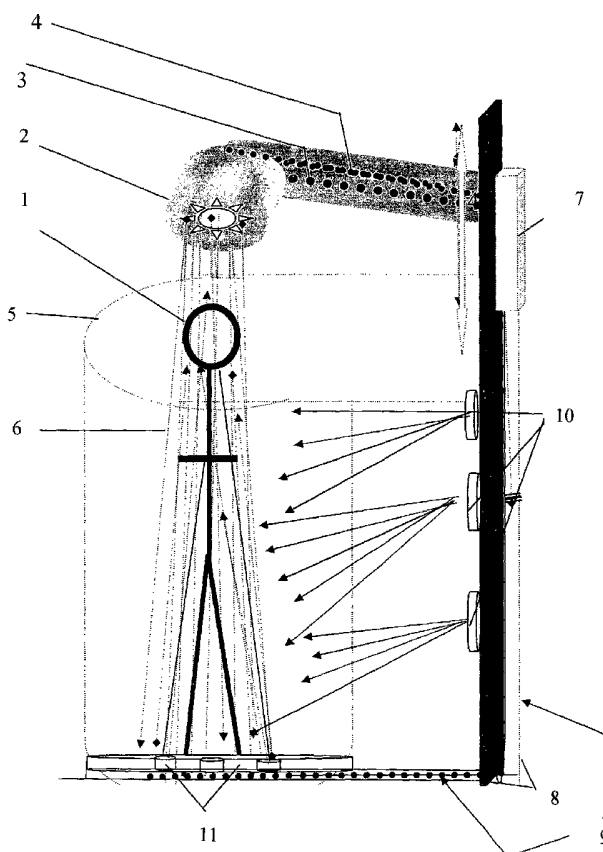
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(54) Title: SHOWER RECESS ASSEMBLY INCORPORATING BODY DRIER



(57) Abstract: A drying system is provided for incorpo-  
ration in a fixed shower recess. The drying system com-  
prises; a shower recess defined by shower walls and an  
opening for entry into the shower recess, a water reticu-  
lation system which supplies water from a water supply to a  
water outlet in the shower recess; characterised in that the  
shower recess further comprises an air supply delivered to  
the space defined by the shower recess from at least one  
wall of the shower recess and via said water outlet. The  
system also includes means to control the delivery of the  
air supply; wherein, in operation, the air supply is deliv-  
ered to the recess thereby drying the body of an occupant  
of the shower recess.



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## SHOWER RECESS ASSEMBLY INCORPORATING BODY DRIER

## BACKGROUND

5 The present invention relates to air dryers and more particularly relates to a full body air dryer capable of use in a shower recess and which may be activated for full body drying after showering. The invention further relates to a drying system for use in a shower recess .

## PRIOR ART

10 Conventionally people use towels to dry themselves after a bath or a shower. This means stretching and bending the body in many ways in order to wipe all body parts. This poses a particular problem for handicapped and elderly people who may experience difficulty in drying the body with a towel. This could affect individual hygiene standards. The contortions required for drying the body could  
15 result in physical harm for the elderly and infirmed. For the general population, the need for a towel is also an inconvenience as towels need to be washed and dried after every time it is used. Thus there is a lot of effort in preparing the towel to be used. Also towels in a bathroom tend to be shared and thus this could lead to transfer of skin problems or diseases between the people who share the same  
20 bathroom.

Also if showering or bathing in a public place, the user must always remember to bring a towel with them. If they forget to bring the towel, they have no convenient alternative means of drying the body.

25 Many business people play sport during lunch time followed by a shower. Participants must remember to bring a towel in order to have a shower after playing sport. If they forget to bring the towel, they are left with the alternative of

not playing sport at all or to just let the sweat dry out on the body, thus leaving the person feeling stuffy and uncomfortable for the rest of the afternoon.

Currently there is no equipment available for full body drying in a shower recess which allows all in one showering drying and optionally massaging. There are in existence a variety of drying machines employed in a variety of drying applications, but none of the known apparatuses are capable of integral adaption to a shower recess for full body drying and optionally massaging.

Among the known drying apparatuses is one where the user stands on a low standing stool and the warm air is blown through holes in the stool's top surface blowing upwards from the feet of the user. Another known apparatus provides a shower cabinet like enclosure, which the user must step into to use, formed by flexible skirts where these skirts have several air holes through which warm air passes thereby providing a side on drying action.

United States Patent 6,189,231 discloses a foot dryer including a dryer housing having front and rear units defining a foot receiving cavity. A footrest is disposed in the foot receiving cavity for supporting a foot of a user. A blower is disposed adjacent the footrest and contained within the rear unit. The blower delivers air under pressure into the cavity. A holder supported by the housing above the user's foot may be used to dispense a moisture or fungus inhibiting agent downwardly onto the foot without the aid of the blower. These devices provide very localised drying only and are not capable of a full body and hair drying.

In another example of a known dryer, United States Patent 5,996,249 teaches a Portable garment dryer with a carrying case, having a support member with a centrally located opening on a top thereof. A light but durable, air permeable garment bag is secured about an opening on a bottom surface of the support member. An elastic member circumscribes the opening on the other side of the support member and snugly receives a barrel of a hair dryer in an air tight relationship. A pair of adjustable straps are secured to the sides of the support member and supports the support member so that the garment bag hangs freely

beneath the support member A damp garment can be hung in the interior of the bag and the hair dryer unit turned on. In a preferred embodiment, foldable flaps extend from the support member to enclose the garment bag folded tightly against the bottom surface of the support member when the garment dryer is not in use. There is no teaching in this patent of adapting the drying device as a body dryer.

United States Patent 6,148,539 discloses a regulated body dryer system including an enclosure having a pair of opposed side walls and a top face coupled between top edges of the side walls. The side walls and the top face are each defined by an outer wall and an inner wall being spaced to define a hollow interior. Also included is a channel positioned within the side walls and the top face of the stall. Next provided is a plurality of vent assemblies mounted on an interior of the side walls and remaining in communication with the channel. Also included is a blower assembly including a fan for directing air through the channel and out of the vent assemblies upon the actuation thereof and a plurality of heating elements mounted within a flow of the air the fan for heating the air upon the actuation thereof. A control panel is provided for actuating the fan and the heating elements upon the depression thereof. This is a free standing dryer which is not capable of integral attachment in a shower recess.

In another example of a known drying apparatus United States Patent 5,970,622 discloses a floor mounted hair drying device which allows a user to dry and style hair using both hands while controlling the temperature and air flow using one or both feet. An electric hair dryer is mounted to a flexible arm. The flexible arm is connected to a floor stand such that the floor stand supports the flexible arm with the electric hair dryer mounting. A foot panel is electrically and mechanically connected to the foot control panel allowing foot operation of the invention. A button on the foot control panel allows a user to control hot or cool air for drying the head of the user and an air flow selection device is operated by a foot control device on the foot control panel which allows said user to chose a volumetric

amount of air flow with a range of air flow starting from a low flow and gradually increasing to a high flow. Most of the well the known drying apparatuses are small for drying local body parts only such as the hands and feet.

5 United States Patent 5,819,431 discloses a foot dryer apparatus and method of drying feet. The foot dryer dispenses heated air under pressure over the entire upper and lower portions of the foot of the user. The dryer includes a dryer housing having a front air baffle unit and a rear air containment unit that defines a foot receiving cavity with the dryer housing. A blower mounts within the dryer  
10 housing for delivering a uniform flow of air under pressure onto the top and bottom portions of one's foot safely and effectively. A mist dispenser mounts within the rear air containment unit of the dryer housing and dispenses automatically a mist of particles of a fungus inhibiting agent downwardly onto the user's toes. The dispensed powder facilitates inhibiting the growth of foot fungus,  
15 such as athlete's foot. The quantity of the agent dispensed is a selected quantity ranging from a nominal dispensing quantity to a maximum dispensing quantity.

Another example of a dryer can be seen in United States Patent 5,752,326 which discloses a personal dryer apparatus for drying articles, particularly people,  
20 comprising a cubicle defining a drying space and one or more air impellers arranged to produce an air flow within the drying space having a swirling or vortex motion. Preferably the air is recirculated, and the recirculated air is treated, for example, heated, dried and cleaned.

In a further example of a drying assembly, United States Patent 6,047,416  
25 discloses a therapeutic shower for enveloping purposes designed to carry out a complete and constant 360-degree therapeutic sweeping of the user's body, water is sprayed from a shower head and a series of holes in tubes along the space provided for use as a shower stall. These tubes are connected together by a rotary air and water servomechanism revolving around a vertical water supply axis. The  
30 holes are positioned to direct the sprays of water toward the centre of the shower

stall. The rotary servo mechanism is driven by a motor, and the servo mechanism induces the circular movement of the tubes around the shower stall, and this movement combines with the water spray action from the tubes to provide the therapeutic coverage of the user's body in the space at the center of the shower stall. To dry off following a shower, users may switch over to sprays of warm air from the same tubes by activating a drying control. This is a self contained portable unit which is not easily adaptable to conventional shower recesses and does not disclose a combined foldable shower including a shower rose, drying air delivery system and massaging system in the one shower.

The benefits of massage on the human body are well known and it is also known that, in order to enjoy such benefits without having to resort to an expert masseur, it has recently become a diffused practice to undergo a hydromassage, this being a massage performed with liquid streams.

In currently available devices however, several weaknesses can be observed in terms of complete user body coverage, thermal variations around the user body, and also with regards to related drying systems. These observed weaknesses lead one to conclude that the therapeutic properties of the current shower devices can be substantially improved. User's needs are therefore only partially met. Drying systems, twinned or integrated into the shower device, do exist, however none of these systems provide a specifically therapeutic effect that can be added to the effects of a multiple jet system. A certain number of shower devices are currently known and available on the market, and several patents referred to above reflect this.

More specifically, the apparatus of Bianchi 4,724,553 proposes a shower device offering a continuous hydromassage but only in one direction, leaving an area of the body uncovered by water or air at any given time.

Several other inventions aim at offering a therapeutic effect on the body (Fohran 2,536,656, Immel 2,341,604, Antoine 5,418,985, Knapp 4,544,690, Hiraishi 5,428,850, Sieth 5,299,743) but by their very design cannot offer the overall

therapeutic effect that is sought here, because they do not allow for a complete and continuous coverage of the whole user body. Fohran 2,536,656 proposes a hydrotherapy device for human body members, therefore not allowing it to cover the whole body and create the desired overall therapeutic effect.

5

#### THE INVENTION

This invention will solve the problems and disadvantages outlined above, of using towels and the need to use towels to dry oneself. It provides a full body drying unit which dries the whole body including the hair. It can combine with a folding shower system and massaging therapeutic system to provide a full experience of luxury drying. Due to the massaging capabilities, it will provide a luxury during the shower as well. The added ability to fold the shower means that the shower will take less space in the bathroom and hence very useful in space conscious areas.

15

In one broad form the present invention comprises:

a drying system for incorporation in a fixed shower recess; wherein the system comprises;

20 a shower recess defined by shower walls and an opening for entry into the shower recess,

a water reticulation system which supplies water from a water supply to a water outlet in the shower recess;

25 characterised in that the shower recess further comprises an air supply delivered to the space defined by the shower recess from at least one wall of the shower recess and via said water outlet; and

means to control the delivery of the air supply; wherein, the air supply is delivered to the recess thereby drying the body of an occupant of the shower recess.

30

In a preferred embodiment of this shower body drying unit, the body drying is controlled by the user from within the shower recess. The user will have the means

of controlling the supply rate, temperature and volume of air delivered to him/herself. It giving the user customisable ability to use the body drier to the user's personal likings for the most comfortable drying experience.

To make the air temperature so as it is adjustable, the unit needs ability to generate regulated and temperature adjustable hot air which is used to dry the user's body.

There are two preferred arrangements in producing this hot air.

The first is by using an electrical heating element with high resistance which will heat up as and then by blowing air through this, hot air is generated. The electricity delivered to the heating element is controlled so that the heat of the air can be controlled.

The other method of regulating air temperature is by having two streams of air, one cold and one hot. These two streams run into a single pipe, hence merging into one stream. These two streams entering the one stream are independently controlled by valves which restrict how much of the stream can enter into the single stream. Hence the temperature can be made adjustable by adding control mechanism to adjusting the ratio of one stream to the other when combining into one stream.

Heating elements to generate hot air consumes energy. In a preferred method of generating hot air, this energy consumption can be reduced by using an air tank.

The hot air needed for the body drier unit can generated prior to the time when the user requires hot air for drying, and is stored in a air tank. This will reduce the energy power needed when the body drier is turned on because the hot air is already available and hence can be blown to the shower recess without much immediate energy consumption.

These heating methods will work in conjunction to a fan driven by a motor. When the air is needed to be blown to the shower recess, the fan will rotate and hence the air flow created. The rate the motor and hence the fan will rotate will be made available for adjusting to the user in the shower recess to allow further customisation.

In a preferred embodiment, it will contain many ways to enhance the body drying experience.

It will do this by incorporating infrared light generators within the shower for use during the drying session. These beams will beam light towards the user and providing infrared therapy to the user. The air blowing into the shower recess will be combined with perfume so that it will provide pleasant fragrance when drying the body to combine to providing a more therapeutic experience. It will work in conjunction with halogen heating mechanisms so to assist in drying up the user's body and the shower room. These therapeutic and drying mechanisms will be built into the shower body drying self contained unit.

In another preferred embodiment, the massaging system will be provided in various methods. It will have a massage assembly capable of massaging a body via hydrotherapy wherein the water jets are positioned at an appropriate location in the shower recess to approximate a body location to be massaged. It will also providing massage through direct contact using massage pads on the body drying unit on the wall. It will also incorporate providing massage through using powerful air jets which will blow air onto the user providing a massaging effect. Hence using these three techniques it will provide a massaging system which will greatly enhance the shower experience. These massaging capabilities will be built into the shower body drying self contained unit.

In another preferred embodiment, the shower will be able to be folded to provide greater benefit to the shower user. Mechanism for folding the shower is described in more detail in the following sections.

#### DETAILED DESCRIPTION

The present invention will now be described in more detail according to a preferred but non limiting embodiment and with reference to the accompanying illustrations; wherein

Figure 1 shows an elevation of a drying system fitted to a shower recess.

Fig 2: shows a shower folding mechanism according to one embodiment

5 Fig 3: shows the same folding mechanism of in Fig 2 highlighting the shower wall/screen element

Fig 4: (a,b,c) shows alternative embodiments of shower folding arrangements.

10 Fig 5: shows the inner workings of one embodiment of an air drier incorporated with a shower head

Fig 6: shows a means for air temperature regulation

15 Figure 1 shows a person 1 located in the foldable shower recess 5 and standing under water and air delivery nozzle 2. Nozzle is capable of delivery of both air and water on demand by the person . Nozzle 2 delivers water to person 1 in the usual manner of operation of a shower. Water is delivered along water line 3 from a traditional water source ( not shown ).

20 Nozzle 2 is also in communication with air dryer line 4 which enables nozzle 2 to function in a dual role of air and water delivery. Airstream 6 is delivered over the person 1 in the foldable shower recess 5.

25 Air delivery is controlled by electric motor 7 which is in communication with air dryer line 4 and air hose 9. According to one embodiment, electric motor 7 includes a fan which delivers air via line 4 or hose 9 that air is distributed from above and from below person 1. It will be appreciated by persons skilled in the art that specific locations of air delivery outlets can be varied to suit individual user requirements.

30 The system of multiple jets directed towards the space provided for use, allows for a potentially complete hot air coverage of the person. The addition of a shower head in the upper part of the shower device completes the body coverage by air

streams for drying. An air extraction system may be placed in the shower recess allowing for fast evacuation of air if necessary and for an increased circulation of ambient air.

The user can complete the shower stage and commence hot air drying.

5

The present invention, provides a method of drying the whole body using ambient or heated air the temperature and flow rate of which may be adjusted. These are adjusted by the user to customise the body drier for individual needs. The height of the body drier can be adjusted to suit any person's height. It provides an all in one shower, body dryer system which can be fitted or retrofitted as an assembly to a conventional shower recess.

10

According to one embodiment, the shower recess includes body massage and body dryer 10 and foot massaging facilities 11 which allow the user to receive a mechanical massage separately or during drying.

15

In one form of the present invention, there is provided an all in one shower, body air dryer and massaging system. The system includes a heating unit, head and body dryer assembly, and the massaging unit providing a more therapeutic experience. The whole shower and drying assembly may be expanded and contracted so as to reduce space in the bathroom unit.

20

Preferably the heating system includes a heating element and an air blowing mechanism such as a fan. The heating element's temperature can be adjusted to control the outputting air temperature. The fan speed can be controlled to adjust the power of the air flow on to the user's body. These adjustments can be made by the user through a dial or switch.

25

Although air may be delivered to an occupier direct to the shower recess by for instance direct passage over a heating element, it may also be delivered direct from a storage tank. The use of a tank to store heated air is more economic as less energy is required to keep the air at a predetermined temperature.

30

Thus pre heated air may be stored prior to use such as before or during a shower whereupon the air is pumped out on demand

5 The body dryer comprises shower head 2 that has two modes of operation so that water and also hot air is delivered via respective lines 3 and 4 according to selection by an operator. Thus, water and air exit the shower head. A switch is used to select air or water. The top of the person (head and hair) and upper body is dried by the shower head and the centre body and below is dried by spaced holes in the wall where hot air exits. The temperature of hot air is controlled by switch

10 The height of the shower head may be automatically adjusted by controlling motor 7. This will allow the user to dry and shower themselves at an ideal height.

The shower, body dryer and massage system can be fitted as an assembly to the normal shower or it may be fitted into a folding shower unit as follows. The advantage of fitting it to a folding shower system is that it will have the added benefit of not taking any space when the shower/body dryer is not being utilised.

One typical assembly shower unit consists of an arm, motor, screw, curtain, water tap, and electric mechanism. Using motor 7 the shower wall moves up and down due to two worm drive rods which align vertically on the side wall. As the motor rotates the worm drive rods one way or the other, the two arms which are attached to this worm drive are moved up or down depending on the direction of rotation of the worm drive rods. The arms have the top side of a curtain attached to it.

20 The bottom side of the curtains is attached to the shower floor, thus as the shower arm moves up or down, the curtain unwinds or unfolds automatically. Thus forming the side walls of the shower. So that the water does not escape this unit, the shower floor edges are slightly raised and the floor has a shower drain for allowing water out and on the four corners it includes places where shower curtains can be attached.

To fold the shower, the arms are lowered and curtains are not extended. The shower floor can be made to rotate 90 degrees from horizontal to the vertical, so that when not used it will lie flat on the wall so the shower will not take any space in the bathroom.

5

The massage facility of the assembly may include foot and body massage apparatuses comprising a floor having massaging reliefs. When a foot is placed there it will be massaged naturally and automatically

10

The foot massage occurs when the floor reliefs move gently so to stimulate, thus massage the feet. The body massage includes water outlets 10 on the side wall (next to the air outlets) which sends a hard jet of water impacting on the body. There is also a mechanical massaging unit incorporated with the wall when the user presses his/her body against it then it will get massaged.

15

The above described, shower case, head, body dryer and optional massage system can be utilised as a set (assembly) or be installed individually as individual parts to the current shower or bathroom set up. The material used for this and that will be durable and water proof.

20

Heating box set up is not restricted to just a simple heating element and fan setup. It may be made from any combination of components which will provide hot air flow so that it will maximise the drying of the body. The material and equipment used will be any suitable durable and water proof material.

25

The body dryer that fits in the shower, especially the side body dryer and the special shower head/ dryer can be sold individually and can be mounted on any existing shower set up conveniently.

30

Fig 5: shows the inner workings of one embodiment of air drier incorporated with a shower head.

The arrangement comprises a heating system container 50 incorporating Heating element coil 51 of high resistance material . The system further comprises a temperature sensor 52 . Fan motor 53 drives fan 54 which receives air via air entry vent 55 , Air Output pipe 57 delivers spray of air 58 and shower water pipe 56 delivers a spray of shower water 59 . Figure 5 numeral 60 shows a combination wall or ceiling mounted assembly which includes all in one a dryer outlet, lights and heating elements.

Fig 6: shows a means for air temperature regulation

The arrangement includes air Entry Vent 70, motor 71 which drives fan 72. The arrangement further comprises valve lid 73 and a heating element coil. Of high resistance material 74. Pipe 75 delivers cold Air and pipe 76 delivers hot air.

In another broad form the present invention comprises a folding shower recess assembly which can be fitted with the body drying system described in the previously described embodiment.

The folding shower assembly comprises of means for collapsing or folding a shower screen,

Motor,

Folding walls,

Wires.

There are three preferred arrangements of folding showers.

These are outlined in figure 4 as a,b and c and are now described.

Fig 4: (a,b,c) shows alternative embodiments of shower folding arrangements.

a) The two walls on the left and the right side are folded like an accordion so are made of suitable material capable of folding. By way of non limiting example it can be made of a creased plastic curtain material. Hence it folds up in the horizontal direction and lies flat against the wall when folded up.

5 b) This embodiment is highlighted further in figures 2 and 3. It is a shower which drops down from the ceiling.

c) This embodiment shows rigid walls as opposed to arrangement shown in embodiment (a). The rigid side walls on the left and right fold in half. Hence it folds up in the horizontal direction and lies flat against the wall when folded up.

10

Figures 2 and 3 describe the folding mechanism involved in the alternative (b) from figure 4 in more detail.

Fig 2: shows a shower folding mechanism according to one embodiment.

15

The embodiment of figure 2 shows a motor 20 which drives reel 22. As it rotates, reel 22 engages pulley rollers 21 which elevate and lower shower tray 24 via linkage elements 23 which may be chains, wires or lines so that the shower tray will be up on the ceiling hence folding up the shower.

20

Fig 3: shows the same folding mechanism of in Fig 2 highlighting the shower wall/screen element.

The arrangement of figure 3 includes ceiling 30, adjacent motor 31 and tray cover box 32. Waterhose 33 supplies water to the shower recess and air hose 34 supplies air. Cover for the accordion 35 incorporates shower screen 36. The occupier activates the air flow via control switch panel 37 which the user can also use to bring the shower screen/walls up or down. Wire/line/chain 38 and shower wall/ accordion 39 co operate in elevating and lowering the shower tray 40. At the bottom of the assembly is shower tray 40 which includes a shower water drain

25

30

41

It will be recognised by persons skilled in the art that numerous variations and modifications may be made to the invention broadly describe herein without  
5 departing from the overall spirit and scope of the invention.

## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

- 1           A body drying system for incorporation in a shower recess; wherein the system comprises;
- 5           a shower recess defined by shower walls and an opening for entry into the shower recess,
- a water reticulation system which supplies water from a water supply to a water outlet in the shower recess;
- characterised in that the shower recess further comprises an air supply delivered to
- 10          the space defined by the shower recess from at least one wall of the shower recess and via said water outlet; and
- means to control the delivery of the air supply; wherein, the air supply is delivered to the recess thereby drying the body of an occupant of the shower recess.
- 15          2           A drying system according claim 1 wherein, the air supply is heated via a heating means prior to delivery of said air to the recess.
- 3           A drying system according claim 2 wherein the air supply is heated via a heating element prior to delivery to the recess.
- 4           A drying system according to claim 3 wherein the air supply to the
- 20          shower recess is heated by an electrical element.
- 5           A drying system according claim 4 wherein, air delivery outlets are located in the shower recess so as to substantially surround a user positioned within the recess through one or more walls and the shower head.
- 6           A drying system according claim 5 further including a user control
- 25          located in the shower recess interior and including means for controlling the supply rate, temperature and volume of air delivered to the occupier via said air outlets.
- 7           A drying system according claim 6 wherein the system includes a delivery fan which is powered by a motor for delivery of air to the shower recess.
- 30          8           A drying system according claim 7 wherein a thermostat is electrically coupled to the heating means to control the amount of thermal energy generated

by the heating means between a selected temperature range of a high and low temperature.

9           A drying system according claim 7 wherein the temperature of the air is adjusted by having a hot air stream and the cold air stream which merges into one  
5           stream according to an adjustable ratio.

10          A drying system according claim 8 or 9 wherein delivery of air is controlled and adjusted via a control which may be operated from within the shower recess for enabling a user to select between a maximum air delivery rate and a minimum air delivery rate or turn on and off the air flow.

10          11          A drying system according claim 10 where the hot air, is generated prior to the time when the user requires hot air for drying, and is stored in a air tank.

12          A drying system according claim 10 further comprising an air extraction system for extracting hot drying air from the shower enclosure.

15          13          A drying system according claim 10 further comprising an halogen heating mechanism assisting in drying up the user's body and the shower room.

14          A drying system according claim 10 wherein there are infrared light generators which beam light towards the user and providing infrared therapy to the user

20          15          A drying system according claim 10 wherein the air pumped into the shower recess is combined with perfume so that it will provide pleasant fragrance when drying the body.

16          A drying system which combines any combination of claims 11, 12, 13, 14 and 15.

25          17          A drying system according claim 16 further comprising a massaging assembly capable of massaging a body via hydrotherapy wherein water jets are positioned at an appropriate location in the shower recess to approximate a body location to be massaged.

18          A drying system according to claim 16 comprising a massaging  
30          assembly capable of massaging at least part of a body of an occupier of the shower recess via mechanical vibration. wherein a massage may be provided with

direct body contact with massaging pads either on walls or on a floor of the recess.

19 A drying system according to claim 16 comprising a massaging assembly wherein there is a air jet which blows air onto the user so that it will provide a massaging effect on the body.

20 A drying system according to claims comprising a massaging assembly with any combination of claims 17,18 and 19.

21 A drying system according to any of the foregoing claims wherein the combination is formed into a compact self contained unit where it will be able to fitted into an existing shower as an additional attachment.

22 A drying system according to any of the above claims however fitted into a room not a shower.

23 A folding shower recess assembly comprising in combination ; means for collapsing or folding a shower screen

motor,  
folding walls,  
wires.

24. A folding shower recess assembly according claim 23 wherein the roof of the shower is attached to the ceiling of the area where the folding shower is positioned

25. A folding shower recess assembly according claim 24 wherein the folding is done by a motor which rotates a roller which inturn winds lines through pulleys and hence drawing the shower tray up to the ceiling.

26. A folding shower recess assembly according claim 25 wherein the shower walls are collapsible and foldable

27 A folding shower recess assembly according claim 26 wherein the shower wall folds vertically in an accordion like manner.

28 A folding shower recess assembly according claim 23 wherein the shower walls are collapsible and foldable horizontally.

29 A folding shower recess assembly according claim 24 where in two of the shower wall folds horizontally in an accordion like manner.

30           A folding shower recess assembly according to claim 29 where in two of the shower walls folds horizontally by folding in half.

31           A folding shower recess assembly according to claim 29 wherein the motor pulls the shower walls in and hence folding the two side walls of the shower in an accordion like manner and hence collapsing the shower to the side wall of where the shower is positioned.

32           A folding shower recess assembly according to any of the claims from 1 ~ 21 wherein it incorporates a body drying system as described in any of the claims 23 ~ 31.

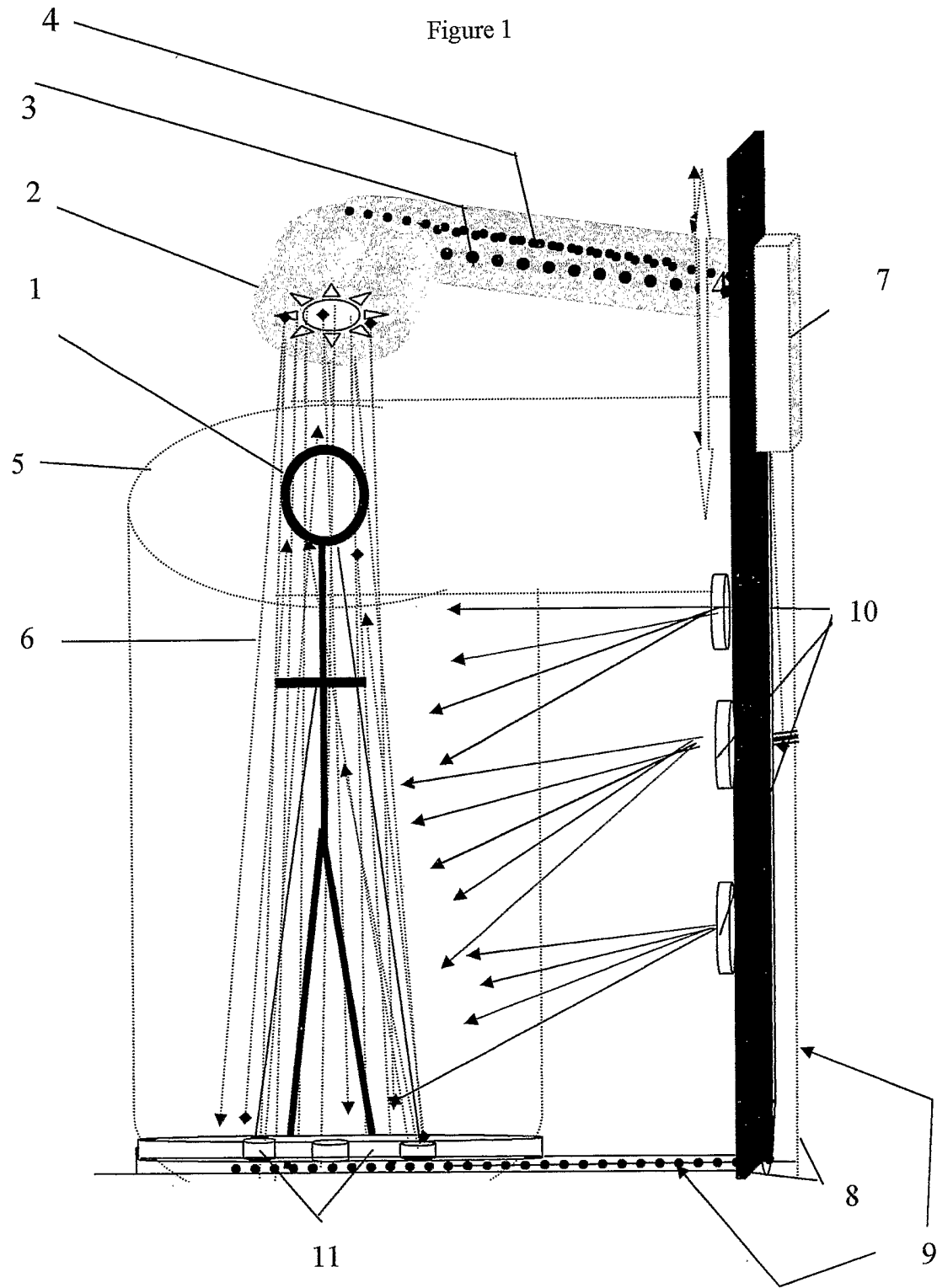


Figure 2

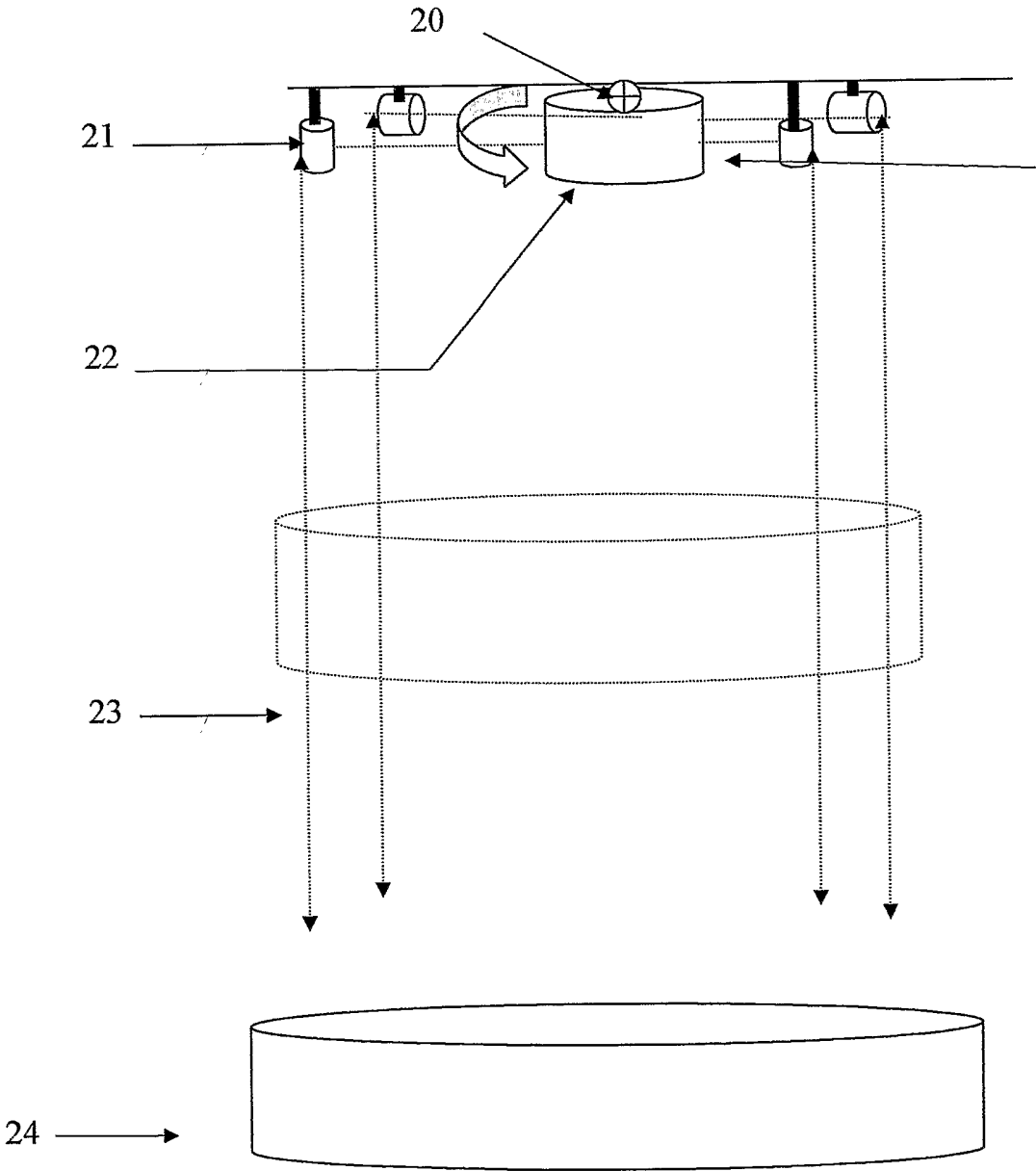


Figure 3

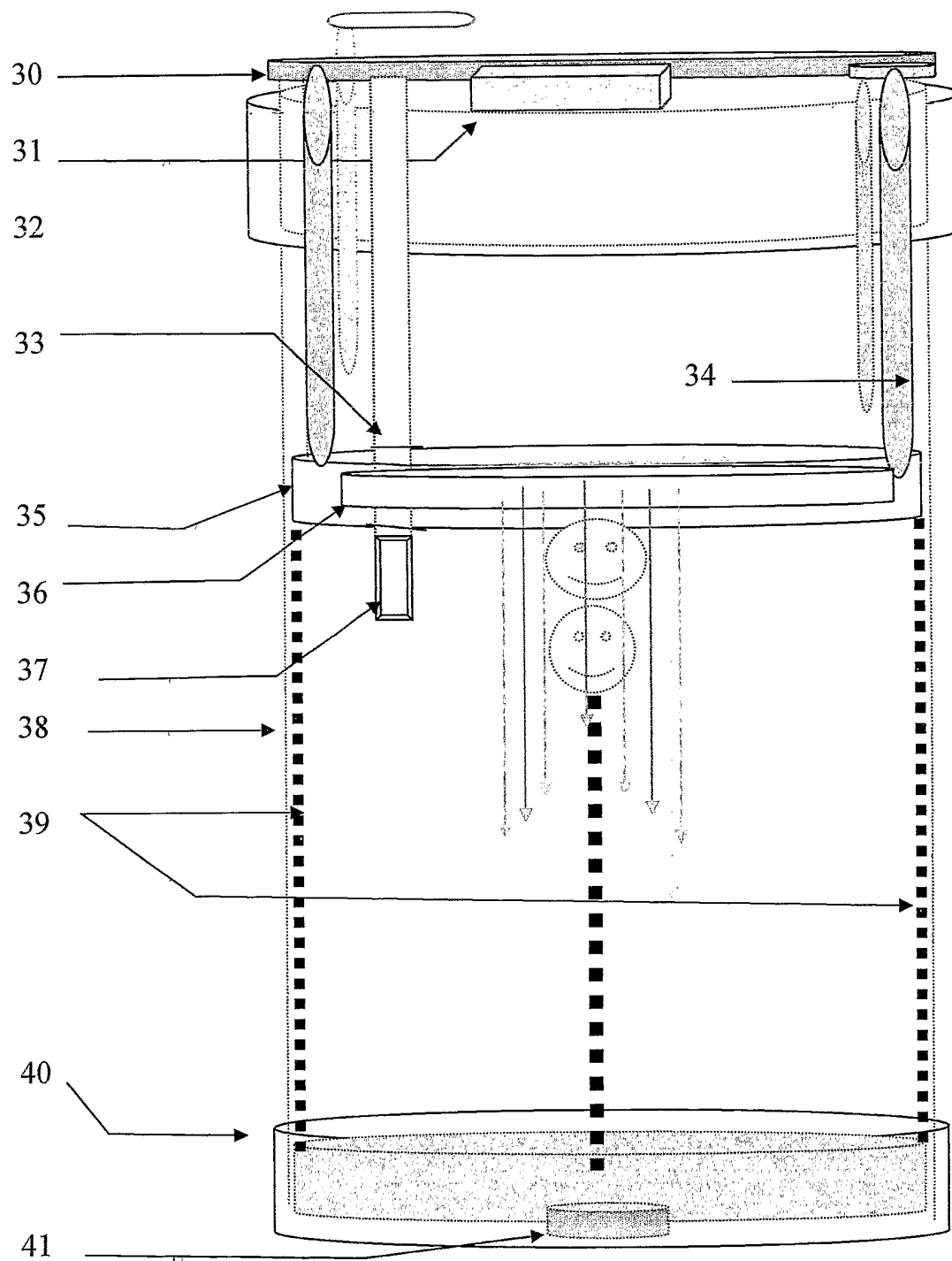


Figure 4

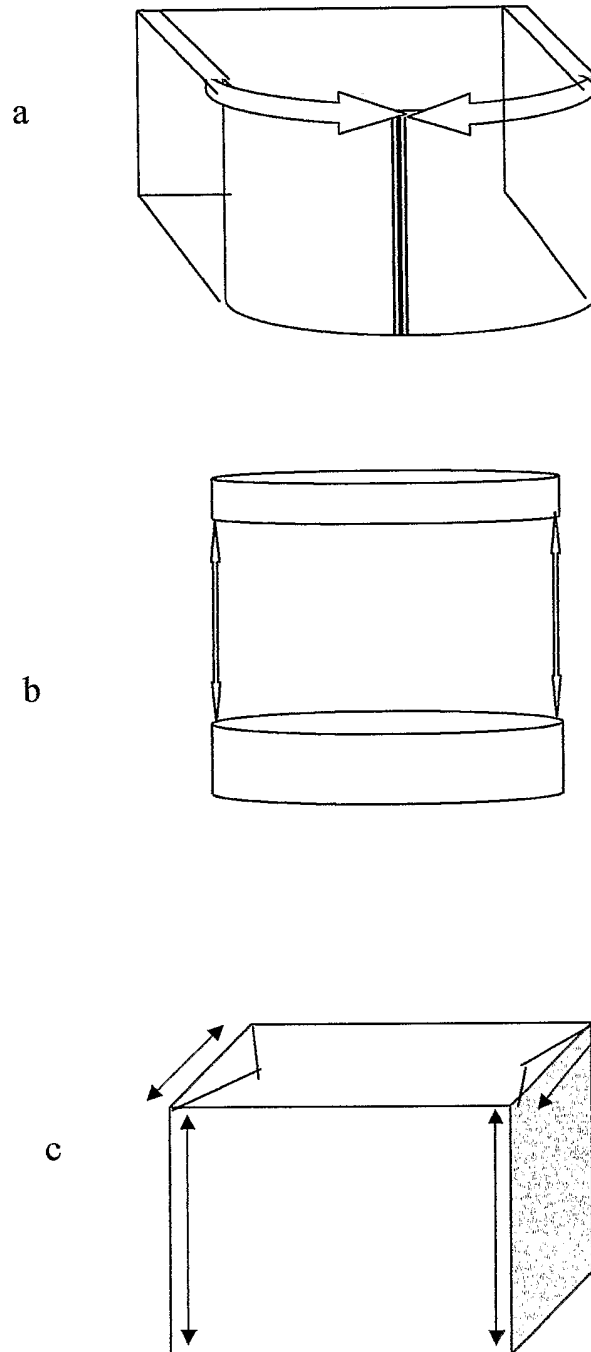


Figure 5

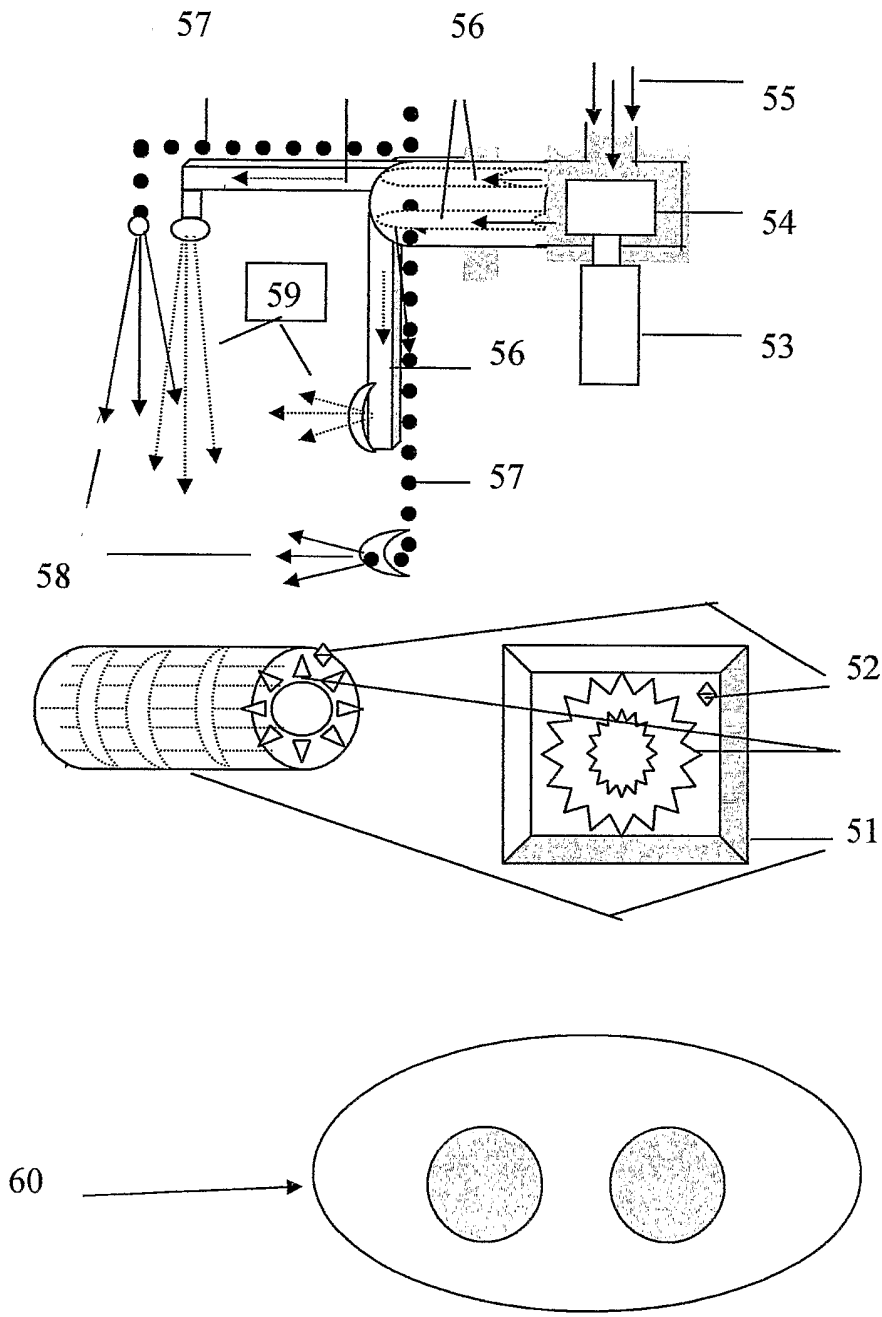
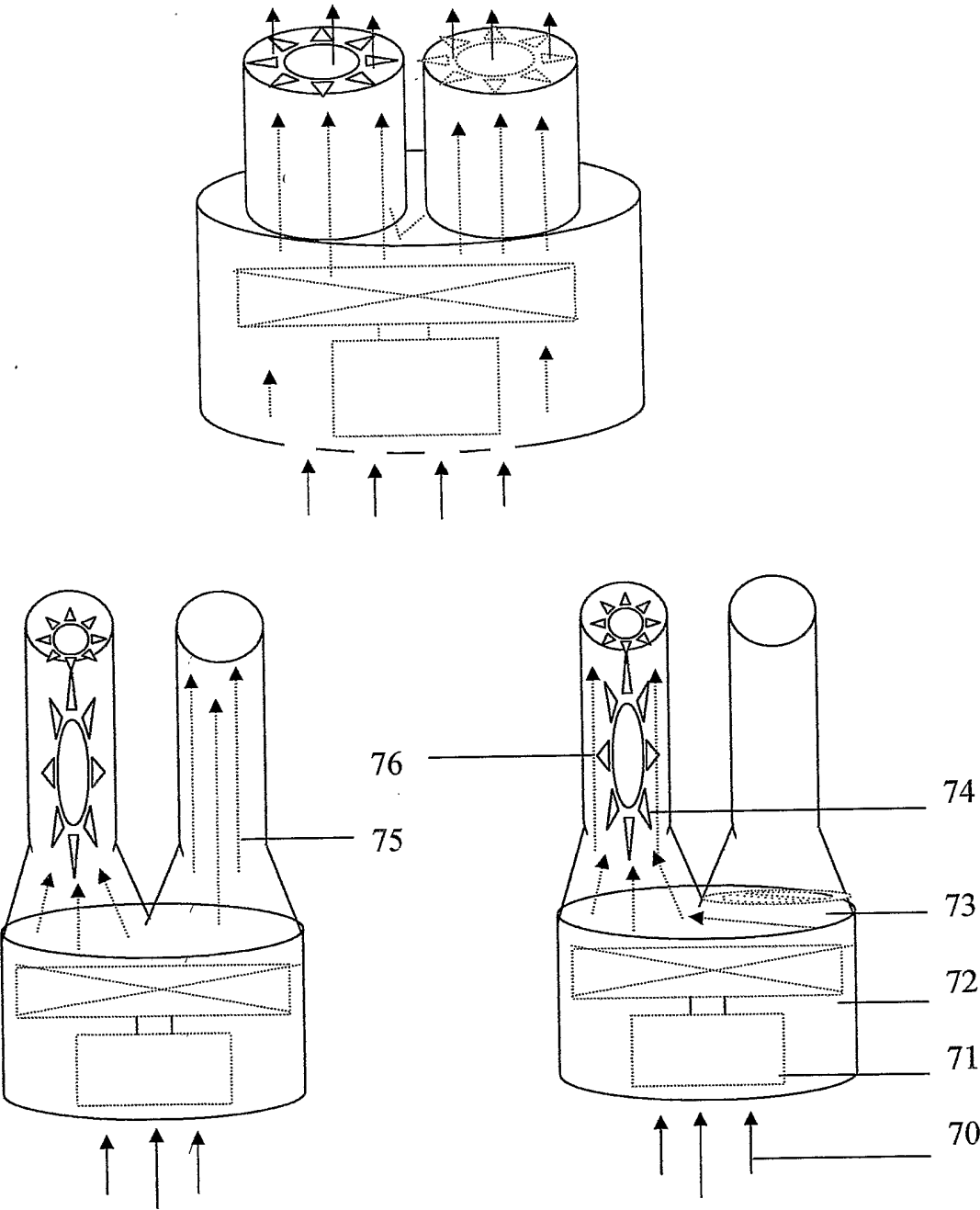


Figure 6



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/01153

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------|--|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| Int. Cl. <sup>7</sup> : A47K 10/48, A47K 3/32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| <b>B. FIELDS SEARCHED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| Minimum documentation searched (classification system followed by classification symbols)<br>Refer Electronic Database consulted below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br>AU: A47K 10/48, 3/23, 3/32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br>Derwent World Patent Index:<br>A47K-010/48, A47K-003/28, A47K-003/22, AND keywords: SHOWER+, DRYER+, HOT OR WARM AIR<br>A61H-009/00, A61H-033/06 AND keywords: SHOWER+, FLOOR, BASE, LUMP+, BUMP+, WATER+                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                               | Relevant to claim No.                                                    |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| X,Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | US 6047416 A (CARRIER) 11 April 2000<br>Whole document                                                                                                                                                                                           | 1 – 22, 32                                                               |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| X,Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | GB 2020970 A (MANNALL) 28 November 1979<br>Whole document                                                                                                                                                                                        | 1 – 22, 32                                                               |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| X,Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | US 5315721 A (OKUN) 31 May 1994<br>Whole document                                                                                                                                                                                                | 24 – 32                                                                  |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                  |                                                                          |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| <p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"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</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"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</td> </tr> <tr> <td>"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)</td> <td>"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</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&amp;" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table> |                                                                                                                                                                                                                                                  |                                                                          | "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 |  |
| "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<br>28 November 2002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                  | Date of mailing of the international search report<br>04 DEC 2002        |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |
| Name and mailing address of the ISA/AU<br>AUSTRALIAN PATENT OFFICE<br>PO BOX 200, WODEN ACT 2606, AUSTRALIA<br>E-mail address: pct@ipaustralia.gov.au<br>Facsimile No. (02) 6285 3929                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                  | Authorized officer<br><br>C. NGUYEN-KIM<br>Telephone No : (02) 6283 2121 |                                                                                                          |                                                                                                                                                                                                     |                                                                                           |                                                                                                                                                                              |                                                                                                                                                                         |                                                                                                                                                                                                                                                  |                                                                              |                                               |                                                                                                        |  |

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/01153

| C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                    |                       |
|-------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------|
| Category*                                             | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X,Y                                                   | AU 1999 51398 A (FLEET) 6 April 2000<br>Whole document                             | 24 – 27, 32           |
| X,Y                                                   | WO 99/34718 A (PERTHU) 15 July 1999<br>Whole document                              | 24 – 27, 32           |
| X,Y                                                   | US 5216763 A (GRENIER) 8 June 1993<br>Whole document                               | 24 – 27, 32           |
| X,Y                                                   | US 4866794 A (DAVIES) 19 September 1989<br>Whole document                          | 24 – 27, 32           |
| X,Y                                                   | US 4170795 A (HAHN) 16 October 1979<br>Whole document                              | 24 – 27, 32           |
| X,Y                                                   | US 4064570 A (KIM) 27 December 1977<br>Whole document                              | 28 – 31, 32           |
| X,Y                                                   | GB 2079595 A (STEVENS) 27 January 1982<br>Whole document                           | 28 – 31, 32           |
| X,Y                                                   | GB 2000965 A (DOLPHIN SHOWERS (PATENT) LIMITED) 24 January 1979<br>Whole document  | 28 – 31, 32           |
| X,Y                                                   | GB 1267705 A (BOLT) 22 March 1972<br>Whole document                                | 28 – 31, 32           |
| X,Y                                                   | EP 603475 A (ALBA) 29 June 1994<br>Whole document                                  | 28 – 31, 32           |
| X,Y                                                   | DE 29615736 U (SCHÄFER) 9 January 1997<br>Whole document                           | 28 – 31, 32           |
| X,Y                                                   | DE 4400293 A (HANSER) 14 July 1994<br>Whole document                               | 28 – 31, 32           |

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/01153

| C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                    |                       |
|------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------|
| Category*                                            | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X,Y                                                  | DE 4114715 A (HESSABI) 12 November 1992<br>Whole document                          | 28 – 31, 32           |
| X,Y                                                  | DE 3204053 A (BAUS) 18 August 1983<br>Whole document                               | 28 – 31, 32           |
| X,Y                                                  | DE 3008401 A (GEORGOPOULOS) 17 September 1981<br>Whole document                    | 28 – 31, 32           |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU02/01153

## Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos : 23, 32  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
  
Claim 23 is not searchable because there is no interworking relationship between the items listed therein.  
Claim 32 is not searchable because:  
– none of claims 1 – 21 defines any folding shower recess and none of claims 23 – 31 defines any body drying system,  
– there is no interworking relationship between the folding shower recess and the body drying system.
  
3. ☐ Claims Nos :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

## Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The body drying system claimed in Claims 1 – 22 and the folding shower recess claimed in Claims 23 – 32 are not so linked as to form a single general inventive concept.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/01153

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<br>Search Report |          | Patent Family Member |          |
|-------------------------------------------|----------|----------------------|----------|
| US                                        | 6047416  | CA                   | 2192601  |
| GB                                        | 2020970  | NONE                 |          |
| US                                        | 5315721  | NONE                 |          |
| AU                                        | 51398/99 | NONE                 |          |
| WO                                        | 9934718  | AU                   | 17523/99 |
|                                           |          | EP                   | 1041914  |
|                                           |          | US                   | 6463599  |
| US                                        | 5216763  | NONE                 |          |
| US                                        | 4866794  | NONE                 |          |
| US                                        | 4170795  | NONE                 |          |
| US                                        | 4064570  | NONE                 |          |
| GB                                        | 2079595  | AU                   | 72599/81 |
|                                           |          | NZ                   | 194261   |
| GB                                        | 2000965  | NONE                 |          |
| GB                                        | 1267705  | DE                   | 2019097  |
|                                           |          | FR                   | 2045515  |
| EP                                        | 603475   | IT                   | 1262504  |
| DE                                        | 29615736 | NONE                 |          |
| DE                                        | 4400293  | WO                   | 9415514  |
| DE                                        | 4114715  | NONE                 |          |
| DE                                        | 3204053  | NONE                 |          |
| DE                                        | 3008401  | NONE                 |          |
| END OF ANNEX                              |          |                      |          |