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(54) **METHOD AND DEVICE FOR UTILIZING  
SOLAR ENERGY**

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(57) **ABSTRACT**

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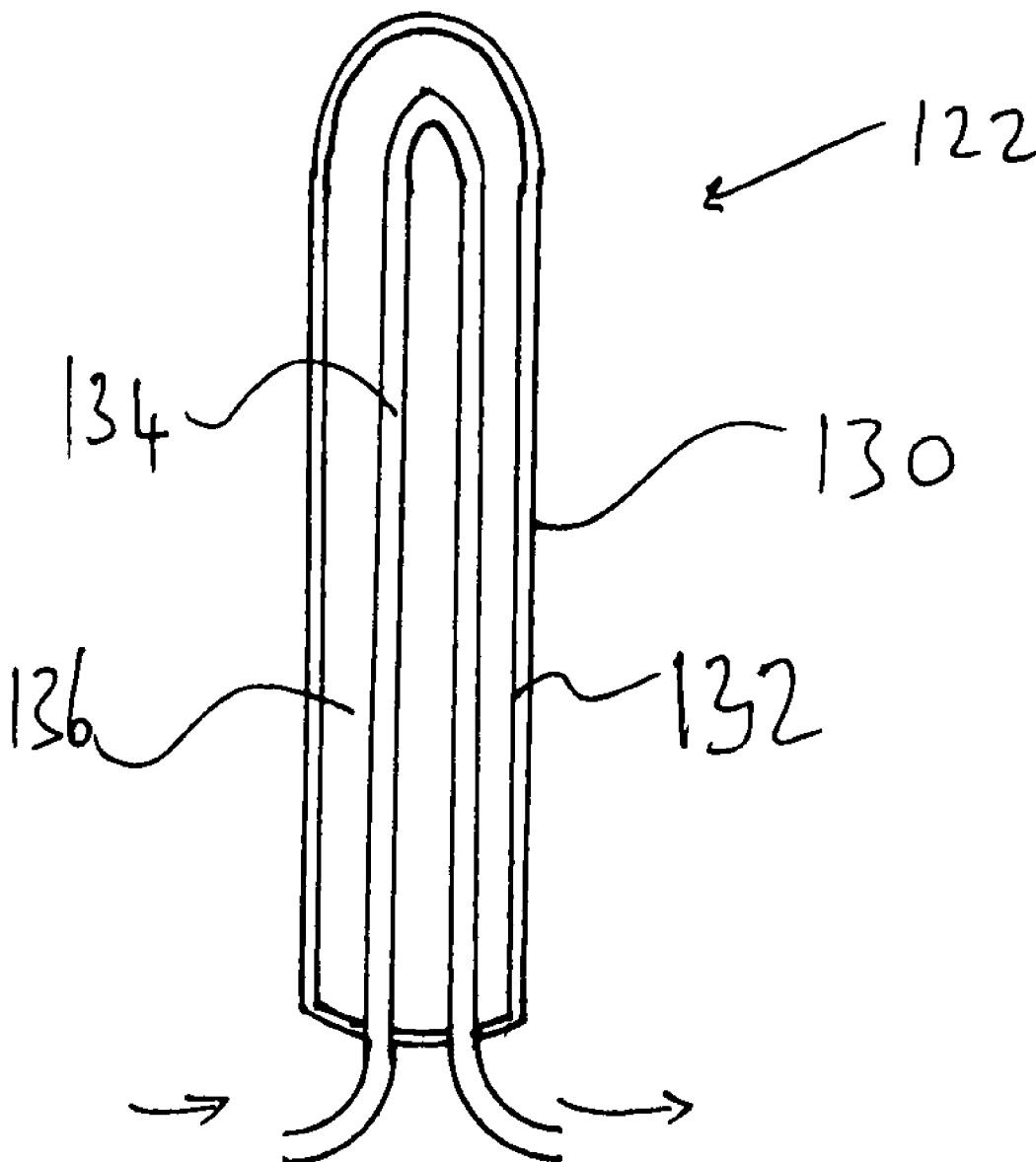
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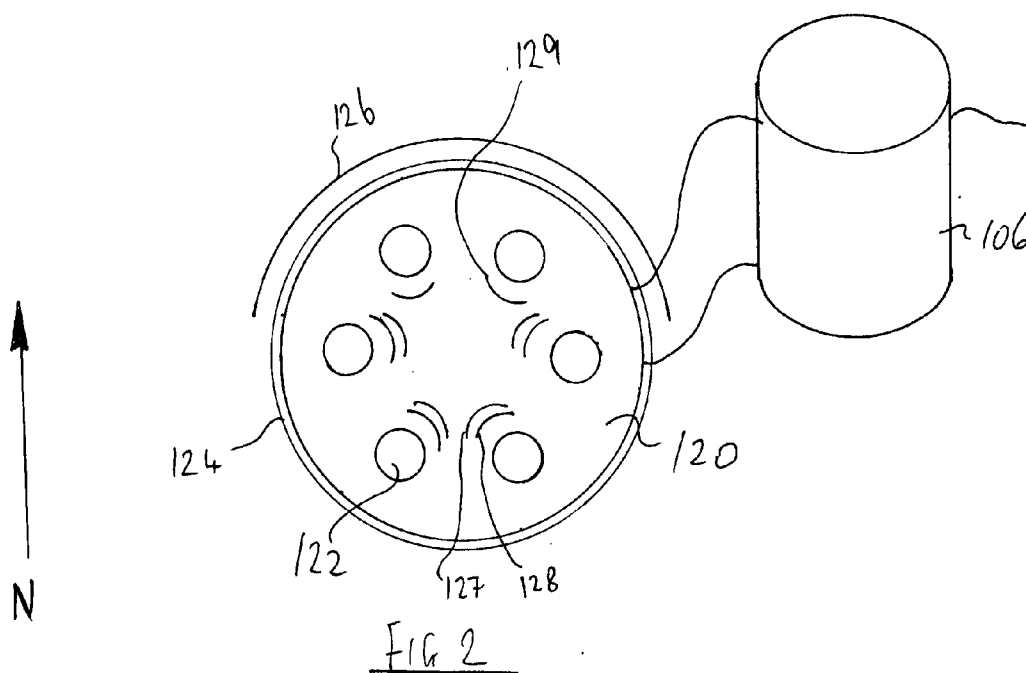
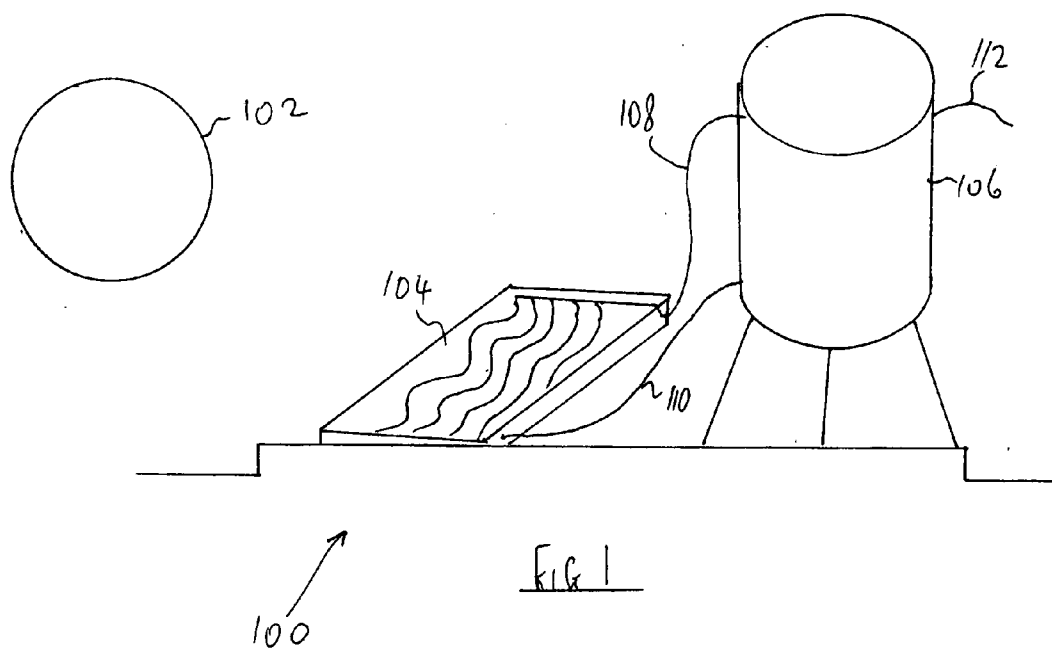
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Vertically placed solar collectors arranged in a circular formation aided by magnifying glasses and mirrors to increase the heating effect of solar energy. Mirrors and magnifying glasses placed around the outside and in the center of the circular formation. Optional computer controlled movement of the solar collectors and/or the mirrors and magnifying glasses to optimally catch the angle of the sun's rays as the earth moves relative to the sun and according to the season. Use of captured energy to heat water and produce electricity for a house and/or an electrically driven car.





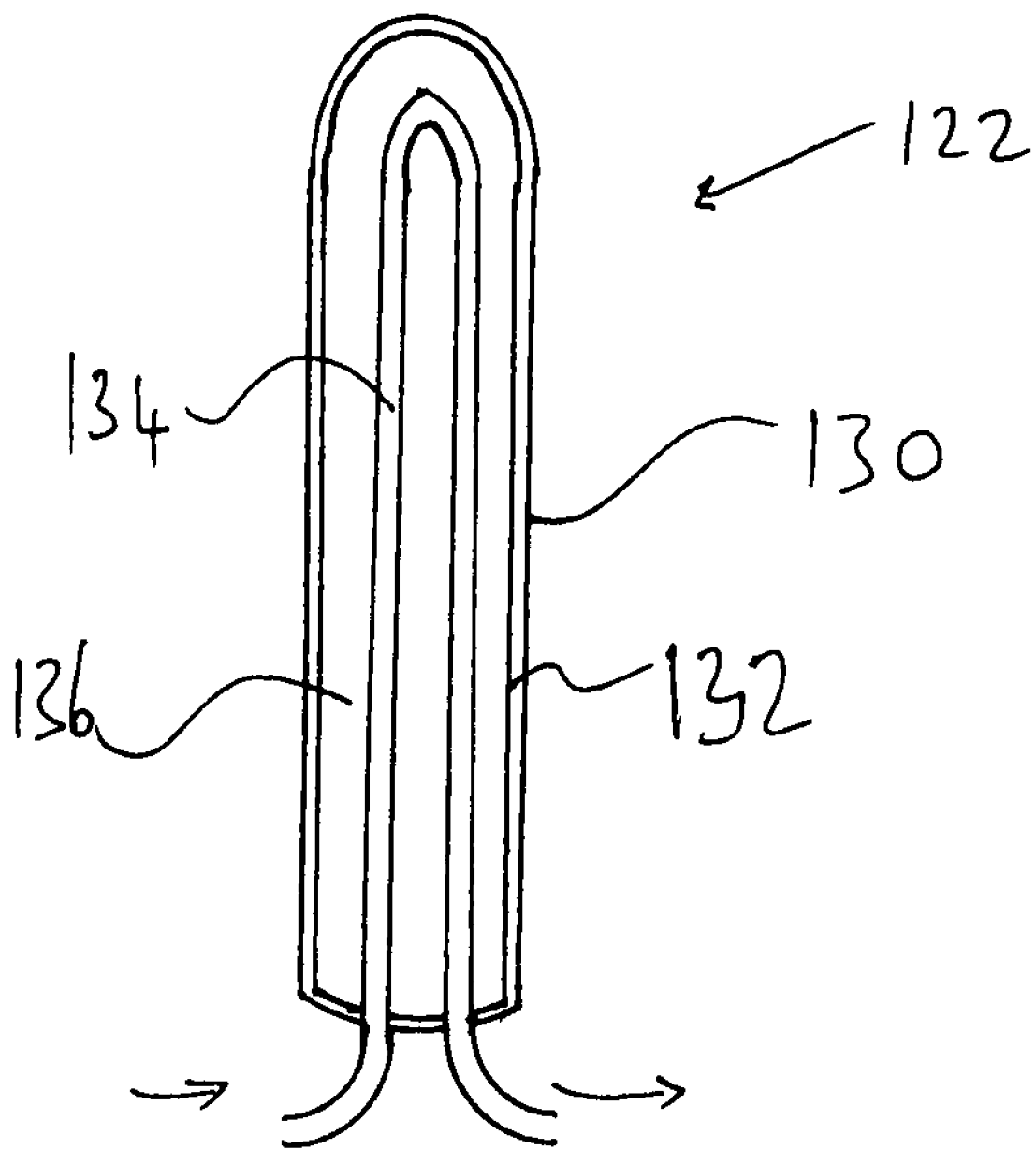


FIG 3

## METHOD AND DEVICE FOR UTILIZING SOLAR ENERGY

### FIELD OF THE INVENTION

**[0001]** This invention is in the field of solar energy and in particular a new system of arranging the solar collectors and utilizing excess energy to produce electricity.

### BACKGROUND OF THE INVENTION

**[0002]** Solar energy has been utilized for mankind's benefit from the earliest times. In more modern times one common use of solar energy is to heat the water in a water system. Such water systems could be on a commercial scale or for domestic use. An additional use is to produce electricity for immediate use or to charge a battery for later use. Use of solar energy is a source of energy that is natural, pollution free, consistent, reliable and without cost. This invention comes to utilize solar energy for both the above mentioned uses.

### SUMMARY OF THE INVENTION

**[0003]** It is to be understood that both the foregoing general description and the following detailed description present embodiments of the invention and are intended to provide an overview or framework for understanding the nature and character of the invention as it is claimed. The accompanying drawings are included to provide a further understanding of the invention and are incorporated into and constitute a part of this specification. The drawings illustrate various embodiments of the invention and, together with the description, serve to explain the principles and operations of the invention but not to limit the invention to these descriptions only.

**[0004]** The object of this invention is to utilize in a more efficient way solar energy.

**[0005]** Another object of this invention is to increase the power of the sun's energy by making the sun's light waves pass through a magnifying glass before reaching the solar collectors. The magnifying glass would be placed in such a way so as to focus the sun's radiation on the solar collectors.

**[0006]** Another object of this invention is to increase the power of the sun's energy by having mirrors placed at the far side of the solar collectors from the sun. The mirrors would be placed in such a way so as to focus the sun's radiation on the solar collectors and thereby increase the intensity of heat and increase the surface area of the collectors heated by the sun's heat and radiation.

**[0007]** Another object of this invention is for the solar collectors to be upright and a cylindrical shape.

**[0008]** Another object of this invention is for the solar collectors to be arranged in a circle or a circular type formation.

**[0009]** Another object of this invention is for the solar collectors to move together with the angle of the sun to catch the optimal solar energy throughout the day. This movement could be both regarding the angle of the solar collectors and their direction relative to the sun. A computer program would be used to adjust the angle and direction of the solar panel according to the data base of the program containing the position of the sun relative to the earth at different latitudes, different seasons of the year and times of the day. A motorized mount holding the solar panel could move the panel according to the changes calculated by the computer program.

**[0010]** Another object of this invention is for the magnifying glasses and/or the mirrors to move together with the sun to catch the optimal solar energy throughout the day. This move-

ment could be both regarding the angle of the magnifying glasses and/or mirrors and their direction relative to the sun. A computer program would be used to adjust the angle and direction of the magnifying glasses and/or mirrors according to the data base of the program containing the position of the sun relative to the earth at different latitudes, different seasons of the year and times of the day. A motorized mount holding the magnifying glasses and/or mirrors could move the mount according to the changes calculated by the computer program.

**[0011]** Another object of this invention is to utilize the energy collected to heat water in a water tank.

**[0012]** Another object of this invention is to utilize the energy collected produce electricity in order to charge a rechargeable battery. This electricity could be produced by photovoltaic technology. The change from utilizing the sun's energy to heat water to producing electricity could be controlled by a heat sensitive switch that would give priority to heating water and when a pre-set water temperature is reached the sun's energy would be utilized by charging an electric battery. The switch would perform the reverse procedure when the temperature of the water fell below a pre-set temperature.

**[0013]** Another object of this invention is to have mirrors at the back of the solar collectors to increase surface area of the collectors heated by the sun's heat and radiation.

**[0014]** Another object of this invention is to have mirrors and/or magnifying glasses in the center of the circle of solar collectors to increase the radiated heat from the sun on the solar collectors.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0015]** The accompanying drawings, which are incorporated in and form a part of this specification, illustrate embodiments of the invention and together with the description, serve to explain by way of example only, the principles of the invention:

**[0016]** FIG. 1 is a diagram of a conventional solar system used to heat water for domestic purposes.

**[0017]** FIG. 2 is a diagram of a solar system with magnifying glass, cylindrical solar collectors arranged in a circular formation.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0018]** As will be appreciated the present invention is capable of other and different embodiments than those discussed above and described in more detail below, and its several details are capable of modifications in various aspects, all without departing from the spirit of the invention. Accordingly, the drawings and description of the embodiments set forth below are to be regarded as illustrative in nature and not restrictive.

**[0019]** FIG. 1 shows a conventional solar energy water heating system 100. This configuration is only one of many options. The variants depend on the capital cost, the ratio of sunlight hours to hours of the day without sunlight and other local factors like for example the possibility of below zero temperatures.

**[0020]** The sun 102 radiates heat and light that falls on a flat plate solar collector 104. When the system relies on convection water flow the water tank 106 should be higher than the collector 104. When this is not the case a water pump is

required to pump the water on its route through the system. The water heated in the solar collector **104** rises to the top of the collector **104** and out through piping **108** to the top of the tank **106**. Cooler water flows from the bottom of the tank **106** through piping **110** to the base of the collector **104** to be heated and the cycle continues. The user of the water takes the supply from the hottest section of the tank **106** namely from the upper section through piping **112**.

[0021] FIG. 2 shows the solar system of this invention where the sun **102** radiates heat and light on the circular solar panel **120**. The solar panel **120** accommodates the cylindrical solar collector tubes **122**. The solar collector tubes **122** are arranged in a circular formation to maximize the efficiency of absorbing energy from the sun as the sun's position changes relative to the earth.

[0022] There are at least two methods of heat transfer from the solar collector tubes **122** to the water being heated. Either the water being heated passes through the tube collectors **122** and the water is heated by the intense heat inside the tubes **122** or a sealed pipe containing a fluid is heated by the heat in the tubes **122** and then a second heat exchange takes place when the sealed pipe passes through the water required to be heated.

[0023] Over the whole area of the solar collection panel **120** is a magnifying glass **124** or group of magnifying glasses aimed to concentrate and intensify the heating effect of the sun's radiation. This magnifying glass **124** could be a mirror on all or part of the northern facing side of the collectors **122**, thereby also heating the opposite side of the collectors **122** that the sun radiation does not reach directly. Alternatively, a mirror **126** could be on the far side of the magnifying glass **124** on the northern facing side of the collectors **122** so that sun's radiation reflected by the mirror **126** will pass through the magnifying glass **124** before focusing on the collector **122**.

[0024] The magnifying glass **124** and/or mirror **126** could be separated into magnifying glasses and mirrors for each solar collector tube **122**. This would enable more exact focusing of the sun's radiation on each tube **122**.

[0025] Inside the circle of solar collectors **122** are mirrors **127** and magnifying glasses **128** to catch the sun's radiation on the northern facing side of the southern solar collection tubes. The northern solar collector tubes would have a magnifying glass **129** on their southern facing side.

[0026] The references herein to north and south refer to the situation in the northern hemisphere.

[0027] FIG. 3 shows a solar collection tube **122** showing the glass outer layer **130**. Inside the glass **130** is an absorber tube **132** that absorbs the sunlight converting the light energy to heat energy. The piping **134** of water or other fluid enters the collection tube **122** and exits having absorbed heat from inside the tube **122**.

[0028] The inside hollow **136** of the collection tube **122** could be a partial vacuum to increase the heat absorption and energy transfer processes.

What is claimed:

1. A method and device for utilizing solar energy comprising,
  - a. at least one solar collector in the shape of an upright cylinder,
  - b. at least one focused magnifying glass between the sun and the said solar collector,
  - c. at least one focused mirror placed the far side of the said solar collector from the sun, and

d. piping containing liquid entering and exiting the said solar collectors,

whereby the said solar collectors and the said liquid in the said piping are heated by the sun's radiation passing through the said magnifying glass and focusing on at least a portion of the said solar collectors and the sun's radiation reflecting from the said mirrors onto at least a portion of the said solar collectors.

2. A method and device for utilizing solar energy as claimed in claim 1 further comprising a computer controlled device to move the said magnifying glass and said mirror to focus the said radiation on the said solar collectors as the position of the earth changes relative to the position of the sun.

3. A method and device for utilizing solar energy comprising,

- a. at least one solar collector in the shape of an upright cylinder,
- b. at least one focused magnifying glass between the sun and the said solar collector,
- c. at least one focused mirror placed the far side of the said solar collector from the sun,
- d. piping containing liquid entering and exiting the said solar collectors, and
- e. a computer controlled mechanism to adjust the direction and angle of the said magnifying glass and said mirror in order to maximize the effect of focused of energy from the sun,

whereby the said solar collectors and the said liquid in the said piping are heated by the sun's radiation passing through the said magnifying glass and focusing on at least a portion of the said solar collectors and the sun's radiation reflecting from the said mirrors onto at least a portion of the said solar collectors and whereby liquid is heated by the said solar collectors.

4. A method and device for utilizing solar energy as claimed in claim 3 wherein the said adjustment is made to the said mirrors and said magnifying glass.

5. A method and device for utilizing solar energy as claimed in claim 3 wherein the said adjustment is made to the solar panel to which is affixed the said solar collectors.

6. A method and device for utilizing solar energy as claimed in claim 1 wherein the said solar collectors are arranged in a formation of 360 degrees.

7. A method and device for utilizing solar energy as claimed in claim 3 wherein the said solar collectors are arranged in a formation of 360 degrees.

8. A method and device for utilizing solar energy as claimed in claim 1 wherein the said solar collectors are other than a cylindrical shape.

9. A method and device for utilizing solar energy as claimed in claim 3 wherein the said solar collectors are other than a cylindrical shape.

10. A method and device for utilizing solar energy as claimed in claim 1 wherein the heat collected is utilized to heat water.

11. A method and device for utilizing solar energy as claimed in claim 1 wherein the energy from the sun is utilized to create electricity and charge a battery using a photovoltaic technology.

12. A method and device for utilizing solar energy as claimed in claim 11 wherein the said utilization begins when the said water reaches a given temperature, the said switch-over from water heating to producing electricity and the reverse action being automatic using a heat sensitive switch.

13. A method and device for utilizing solar energy as claimed in claim 3 wherein the heat collected is utilized to heat water.

14. A method and device for utilizing solar energy as claimed in claim 3 wherein the heat collected is utilized to create electricity and charge a battery using a photovoltaic technology.

15. A method and device for utilizing solar energy as claimed in claim 14 wherein the said utilization begins when

the said water reaches a given temperature, the said switch-over from water heating to producing electricity and the reverse action being automatic using a heat sensitive switch.

16. A method and device for utilizing solar energy as claimed in claim 1 further comprising at least one mirror and at least one magnifying glass in the center area of a circular type formation of the said solar collectors thereby increasing the heat and radiation of the sun on the said solar collectors.

17. A method and device for utilizing solar energy as claimed in claim 3 further comprising at least one mirror and at least one magnifying glass in the center area of a circular type formation of the said solar collectors thereby increasing the heat and radiation of the sun on the said solar collectors.

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