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(54) **EVAPORATION RETARDING COVER**

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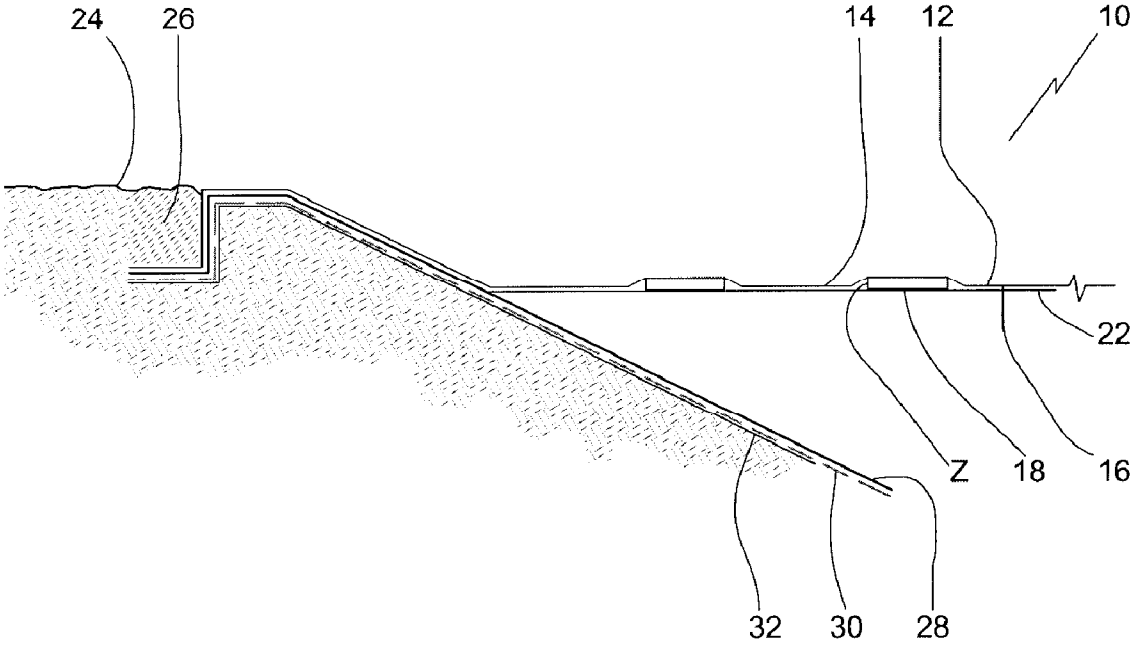
(57) **ABSTRACT**

An evaporation retarding cover which includes an ultra-violet radiation resistant sheet made from a material that provides a water evaporation retarding barrier. The material has an upper surface and a lower surface. Flexible floatation strips of closed cell foam are thermally bonded to the lower surface.



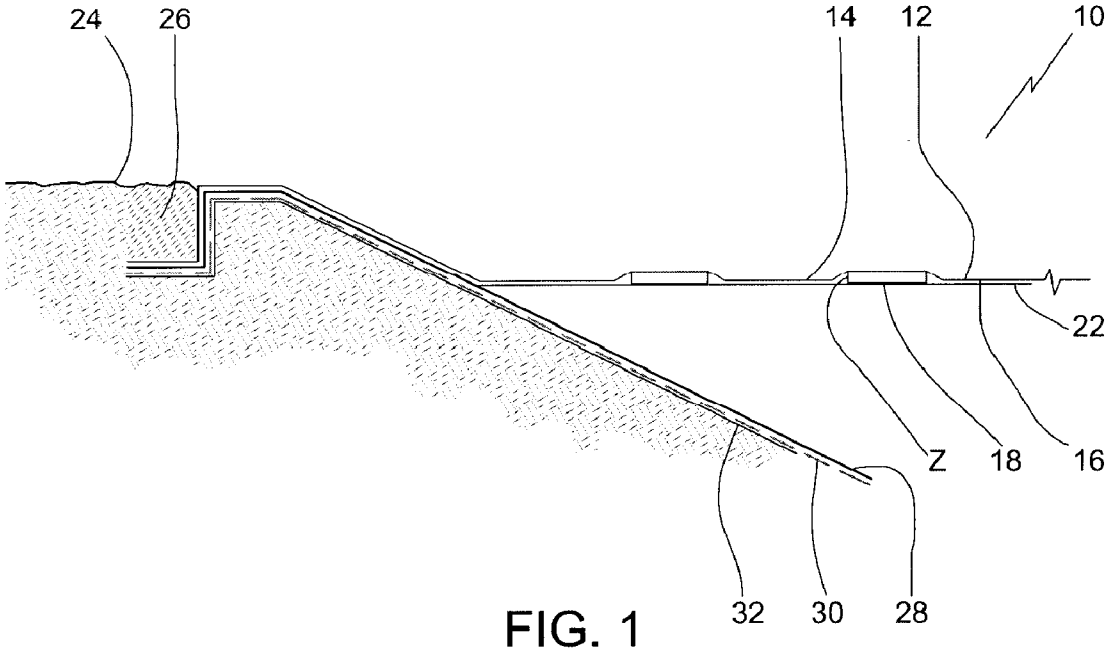



FIG. 1

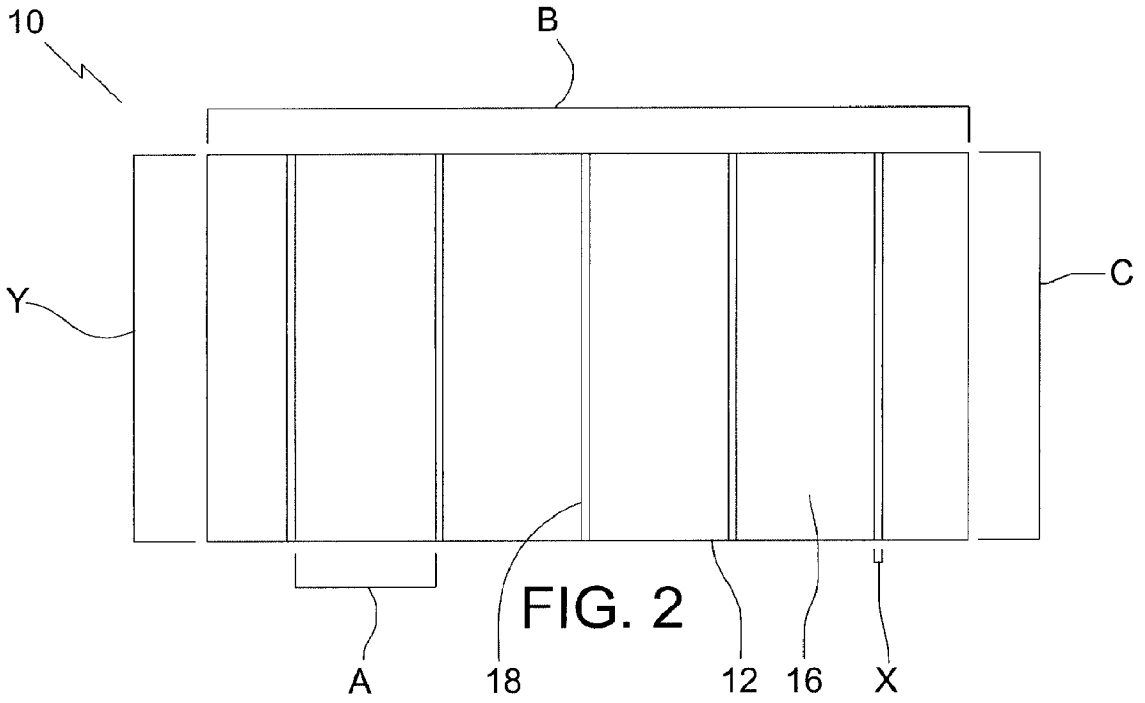



FIG. 2

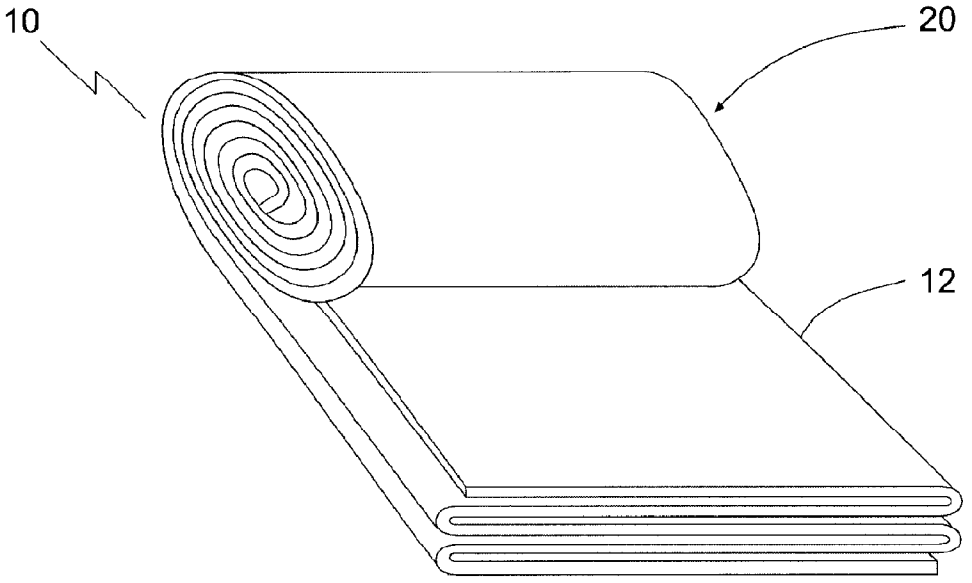



FIG. 3

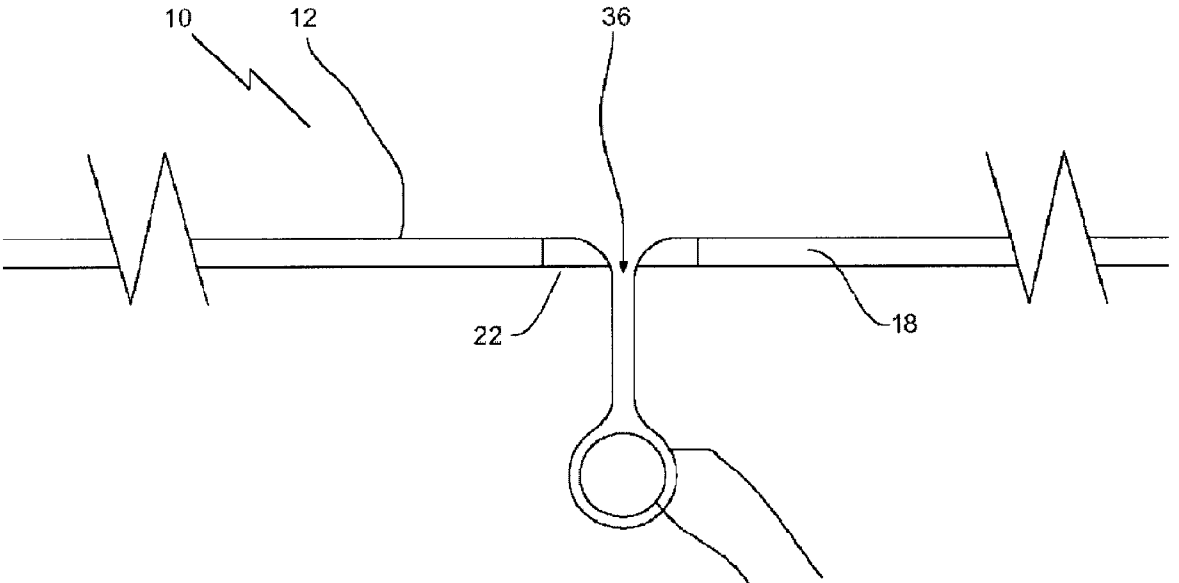



FIG. 4

# EVAPORATION RETARDING COVER

## FIELD

**[0001]** The present invention relates to a cover that can be used to cover a body of water in order to retard evaporation.

## BACKGROUND

**[0002]** With water shortages being experienced in some portions of the United States, steps are being taken to reduce water losses due to evaporation. When making a decision as to whether or not to use an evaporation retarding cover, the cost of the evaporation retarding cover is a factor. There is a need for a relatively inexpensive evaporation retarding cover. These covers are referred to as evaporation retarding covers even though there may be other factors that motivate their use. For example, evaporation retarding covers are sometimes used to retard algae growth.

## SUMMARY

**[0003]** There is provided an evaporation retarding cover which includes an ultra-violet radiation resistant sheet made from a material that provides a water evaporation retarding barrier. The material has an upper surface and a lower surface. Flexible floatation strips of closed cell foam are thermally bonded to the lower surface.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0004]** These and other features will become more apparent from the following description in which reference is made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

**[0005]** FIG. **1** is a side view, in section, of an evaporation retarding cover.

**[0006]** FIG. **2** is a bottom plan view of the evaporation retarding cover illustrated in FIG. **1**.

**[0007]** FIG. **3** is a perspective view of the evaporation retarding cover illustrated in FIG. **1**, being fed from a roll.

**[0008]** FIG. **4** is a side view, in section, of a sump used with the evaporation retarding cover of FIG. **1**.

## DETAILED DESCRIPTION

**[0009]** An evaporation retarding cover generally identified by reference numeral **10**, will now be described with reference to FIG. **1** through **4**.

**[0010]** Structure and Relationship of Parts:

**[0011]** Referring to FIG. **1**, evaporation retarding cover **10** consists of an ultra-violet (UV) radiation resistant sheet **12** made from a material that provides a water evaporation retarding barrier. Sheet **12** has an upper surface **14** and a lower surface **16**. Flexible floatation strips **18** of closed cell foam are thermally bonded to lower surface **16**.

**[0012]** It will be appreciated that there are various ways in which sheet **12** can be made ultra-violet radiation resistant. A UV radiation protective coating may be placed on upper surface **14** or a UV radiation protectant may be dispersed throughout sheet **12**. It will also be appreciated that in order to provide a water evaporation retarding barrier, sheet **12** need only be sufficiently impermeable that it serves to slow down water evaporation.

**[0013]** Beneficial results have been obtained when sheet **12** is made of a polyolefin geo-membrane and flexible floatation strips **18** are of a compatible polyolefin closed cell foam. The specific polyolefin geomembrane used in tests was a polyethylene for sheet **12** in combination with a polyethylene closed cell foam for floatation strips **18**. In addition, any other polyolefin, blend, or specialty polymer may be used to construct floatation strips **18**. One example of a material used to construct floatation strips **18** is polypropylene.

**[0014]** Referring to FIG. **2**, floatation strips **18** may be constructed with a width X of between one and three feet, such as two feet wide. Floatation strips **18** are spaced apart from each other as shown in FIG. **2** with a distance A of between forty and fifty feet. It should be understood that other values of distance A larger than fifty feet or less than forty feet may be used. Floatation strips **18** may have a length Y around one hundred feet, or another suitable length. Referring to FIG. **1**, floatation strips **18** may have a thickness Z of one half of an inch. Alternatively, other values of thickness Z are possible. Thickness Z must be thick enough to allow evaporation retarding cover **10** to float while being thin enough to allow evaporation retarding cover **10** to be rolled into a roll **20** (shown in FIG. **3**).

**[0015]** Floatation strips **18** may be attached to sheet **12** by thermal bonding. Hot air, hot wedge, or any other suitable welding equipment may be used. Floatation strips **18** may be welded continuously along its edges to sheet **12**. In addition, floatation strips **18** may be attached to sheet **12** at the place of construction of evaporation retarding cover **10**. It is advantageous to attach floatation strips **18** to sheet **12** in the factory as opposed to the field. This is due to the fact that factory welding equipment is more reliable and practical to use than similar equipment used in the field. It also may be impractical to weld floatation strips **18** to sheet **12** in the field, because floatation strips **18** are to be welded to lower surface **16** of sheet **12**. Referring to FIG. **1**, this would be difficult if sheet **12** is being installed over a body of water **22**.

**[0016]** Referring to FIG. **2**, sheet **12** is constructed with a length B of two hundred feet and a width C of one hundred feet. It should be understood that other values for length B and width C are possible. Length Y of floatation strips **18** may be equal to width C of sheet **12**. More commonly, referring to FIG. **4**, there are breaks **36** for the formation of sumps **38** for drainage and to take up slack as water levels rise and fall. Sumps **38** may support sand tubes **40**. Sand tubes **40** provide a source of weight that allows sumps **38** to provide tension to sheet **12**. This design allows sumps **38** to act as expansion joints in situations where expansion and contraction are of concern. As can be seen in FIG. **4**, there would be a gap in flotation strips **18**, such that they would not extend under sump **38**. There may be other gaps in flotation strips **18**, such as where sheet **12** extends onto shore. It will appreciated that evaporation retarding cover **10** may come in various shapes and sizes.

**[0017]** Referring to FIG. **3**, it is preferred, but not essential that sheet **12** with flexible floatation strips **18** (shown in FIG. **1**) attached be formed into roll **20**. This may be accomplished by folding sheet **12** in an accordion fashion and then rolling it into roll **20**. The fact that sheet **12** can be formed into roll **20** with flexible floatation strips **18** attached, provides an indication of how flexible floatation strips **18** are. It is useful to form evaporation retarding cover **10** into roll **20** for transportation.

**[0018]** Operation:

**[0019]** In the prior art, evaporation retarding covers were generally installed after water was drained from the pond or prior to filling of the pond. The reason for this was that it was necessary to assemble a framework of floats and secure the framework of floats on top of the evaporation retarding cover. This could only be done when the pond was empty. Measures were then taken to protect the framework of floats from UV radiation, as the closed cell foam rapidly deteriorates when exposed to UV radiation. Because the floats were attached to the top of the geomembrane in the prior art, an additional covering of geomembrane was required over each float.

**[0020]** Referring to FIG. **1**, evaporation retarding cover **10** can be floated into place on body of water **22**. There is no need to drain the pond or make other provisions for assembly, as flexible floatation strips **18** are thermally bonded to sheet **12**, so that they are an integral part of evaporation retarding cover **10**. There is no need to take measures to protect flexible floatation strips **18** from UV radiation, as flexible floatation strips **18** are sheltered from UV radiation by sheet **12**. Flexible floatation strips **18** are sufficiently flexible that evaporation retarding cover **10** can still be formed into roll **20** (shown in FIG. **3**), for ease of handling and transportation. The use of a lighter floatation system, enables the thickness of sheet **12** to be reduced, which further reduces overall cost. The preferred form of folding is first into an "accordion" fold and then into a roll. When delivered to a body of water, roll **20** is unrolled and then deployed by pulling along one edge to unfold in stages the accordion fold.

**[0021]** Referring to FIG. **1**, once in place over body of water **22**, evaporation retarding cover **10** may be secured to a shore **24**. It should be understood that there are numerous ways of affixing cover **10** to shore **24**. One method of securing evaporation retarding cover **10** to shore **24** may be accomplished by burying one end of cover **10** in a compacted fill-in anchor trench **26**. In addition to securing cover **10** to shore **24**, anchor trench **26** may also secure a liner **28** and an underlay **30**. Liner **28** and underlay **30** may be provided along a bottom **32** of body of water **22**, in order to prevent water loss to the surroundings. Liner **28** may be made from geomembrane materials, while underlay **30** may be made from geotextile materials.

**[0022]** In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

**[0023]** It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiments without departing from scope of the Claims.

What is claimed is:

**1**. An evaporation retarding cover, comprising:

an ultra-violet radiation resistant sheet made from a material that provides a water evaporation retarding barrier, the material having an upper surface and a lower surface;

flexible floatation strips of closed cell foam thermally bonded to the lower surface.

**2**. The evaporation retarding cover of claim **1**, wherein the sheet material is a polyolefin geo-membrane and the flexible floatation strips are of a compatible polyolefin closed cell foam.

**3**. The evaporation retarding cover of claim **1**, wherein the sheet material with flexible floatation strips attached are formed into a roll.

**4**. The evaporation retarding cover of claim **1**, wherein the ultra-violet radiation resistant sheet comprises an expansion joint, the expansion joint having a weight for applying a tensioning force to the sheet.

**5**. The evaporation retarding cover of claim **1**, wherein the ultra-violet radiation resistant sheet comprises a sump portion, the sump portion having a weight for lowering the sump portion relative to the sheet.

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