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Morgan et al.

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(45) **Date of Reissued Patent:** **Jul. 20, 2010**

- (54) **INSULATED REMOVABLE POND COVER** 3,374,918 A * 3/1968 Creith 220/216
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- (75) Inventors: **William Deyo Morgan**, Bloomington, MN (US); **Michael Allan Morgan**, Edina, MN (US)
 (73) Assignee: **Industrial & Environmental Concepts, Inc.**, Edina, MN (US)
 (21) Appl. No.: **08/828,330**
 (22) Filed: **Mar. 28, 1997**

Related U.S. Patent Documents

Reissue of:
 (64) Patent No.: **5,400,549**
 Issued: **Mar. 28, 1995**
 Appl. No.: **08/139,835**
 Filed: **Oct. 22, 1993**

- (51) **Int. Cl.**
E04B 7/00 (2006.01)
B65D 88/34 (2006.01)
E04H 4/10 (2006.01)
C02F 1/00 (2006.01)

- (52) **U.S. Cl.** **52/23**; 52/5; 4/498; 160/231.1; 220/216; 210/DIG. 9
 (58) **Field of Classification Search** 52/3-5, 52/309.9, 222, DIG. 13, 23, 408, 409, 745.06, 52/745.1, 748.1, 502.1, 63; 4/498, 503; 160/231.1; 403/291, 393; 210/DIG. 9; 220/216; 405/129.45, 405/129.9
 See application file for complete search history.

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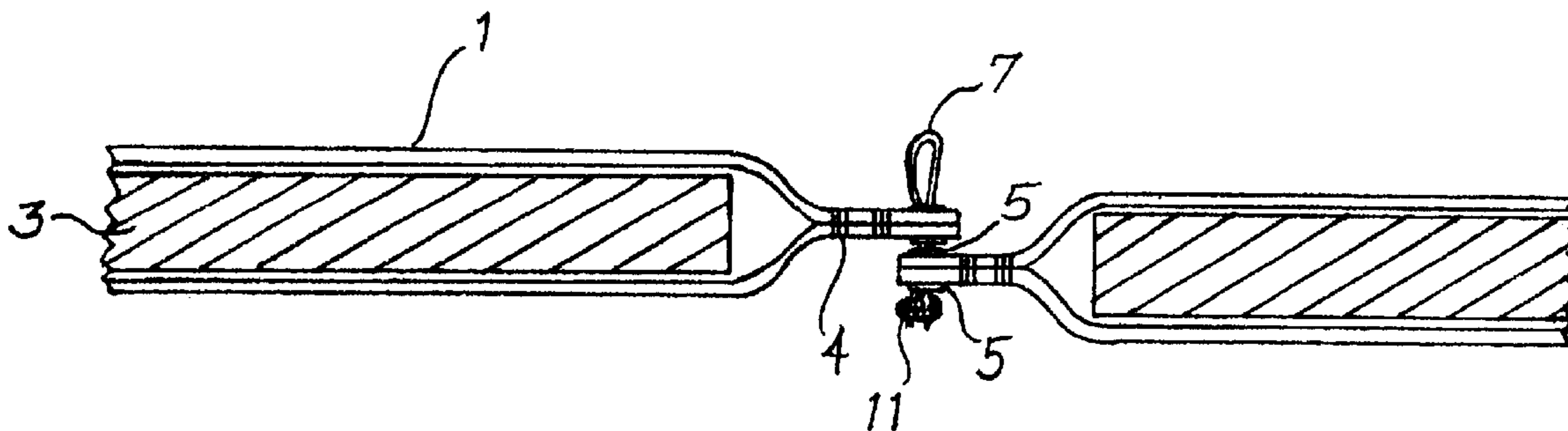
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Primary Examiner—Robert J Canfield
 (74) *Attorney, Agent, or Firm*—Fulbright & Jaworski L.L.P.

(57) **ABSTRACT**

An insulated removeable pond cover for settling ponds. The pond cover comprises a plurality of sealed panel units containing insulation. The panel units are linked together by means of a system of cables which pass through grommets in the panel units.

36 Claims, 5 Drawing Sheets



US RE41,442 E

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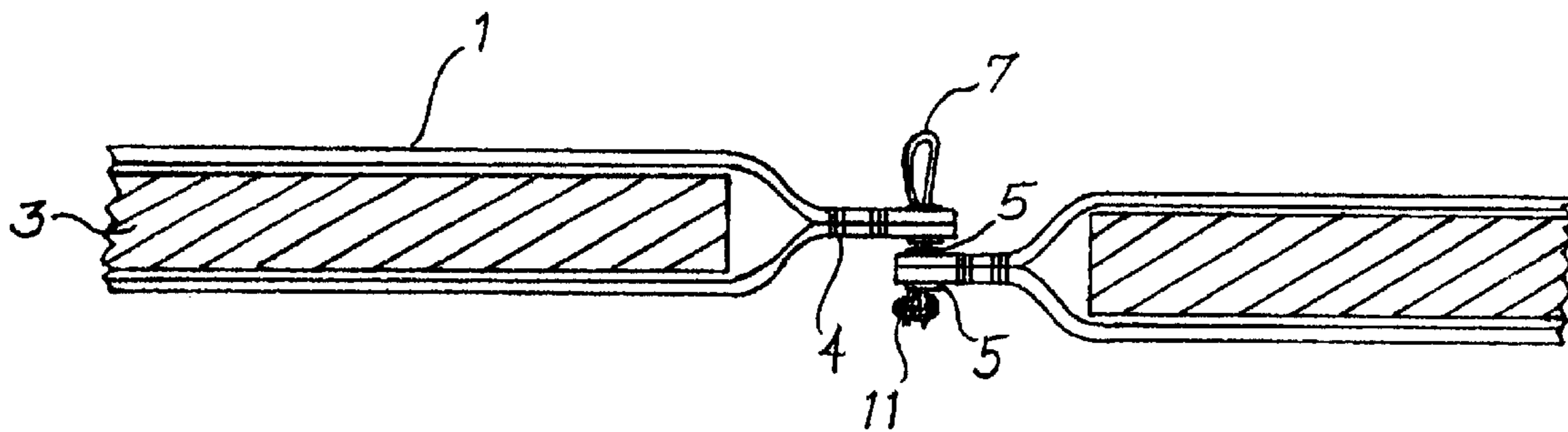


FIG. 1.

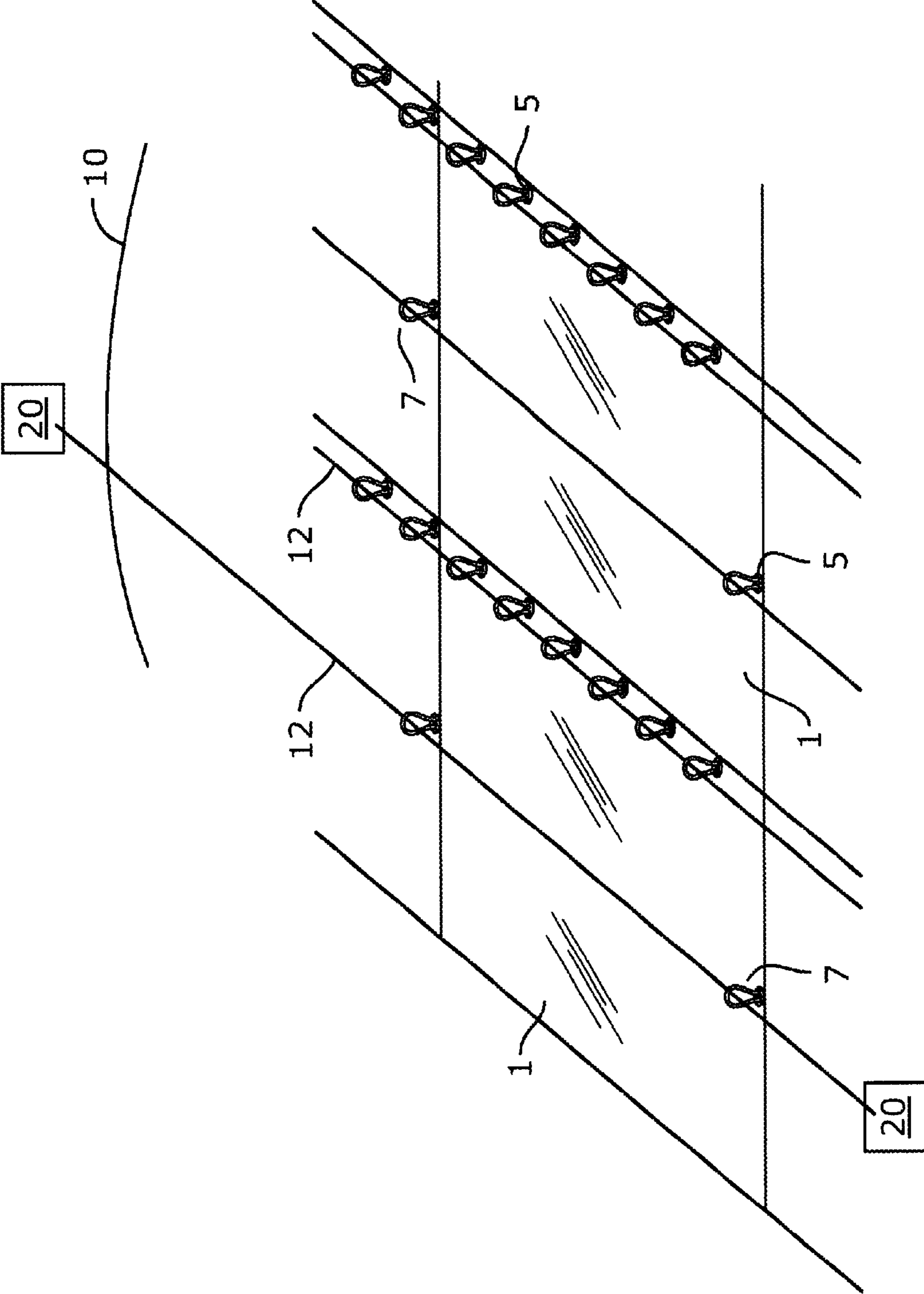


FIG. 2
AMENDED

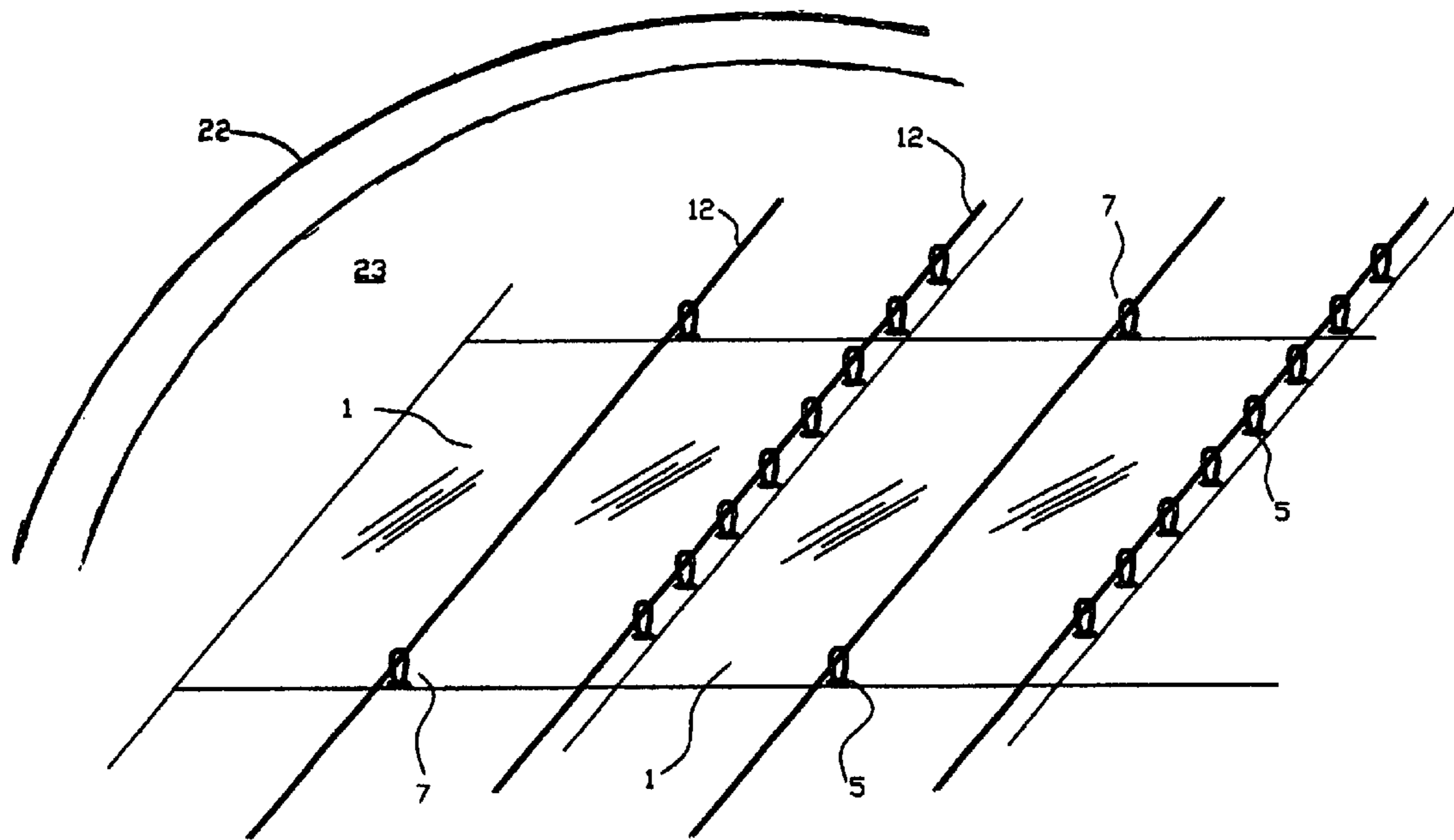


FIG. 3 AMENDED

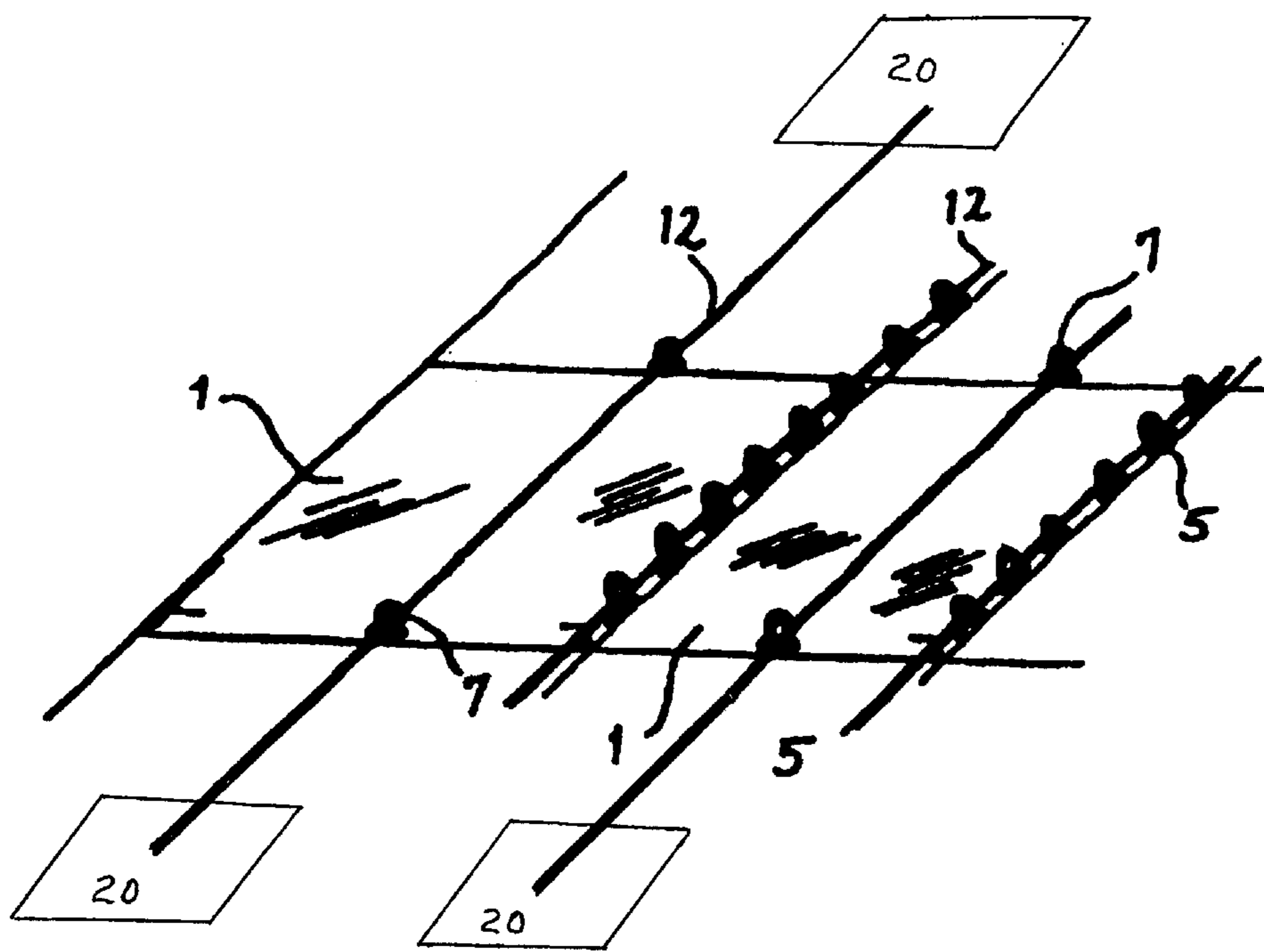


FIG. 4. amended

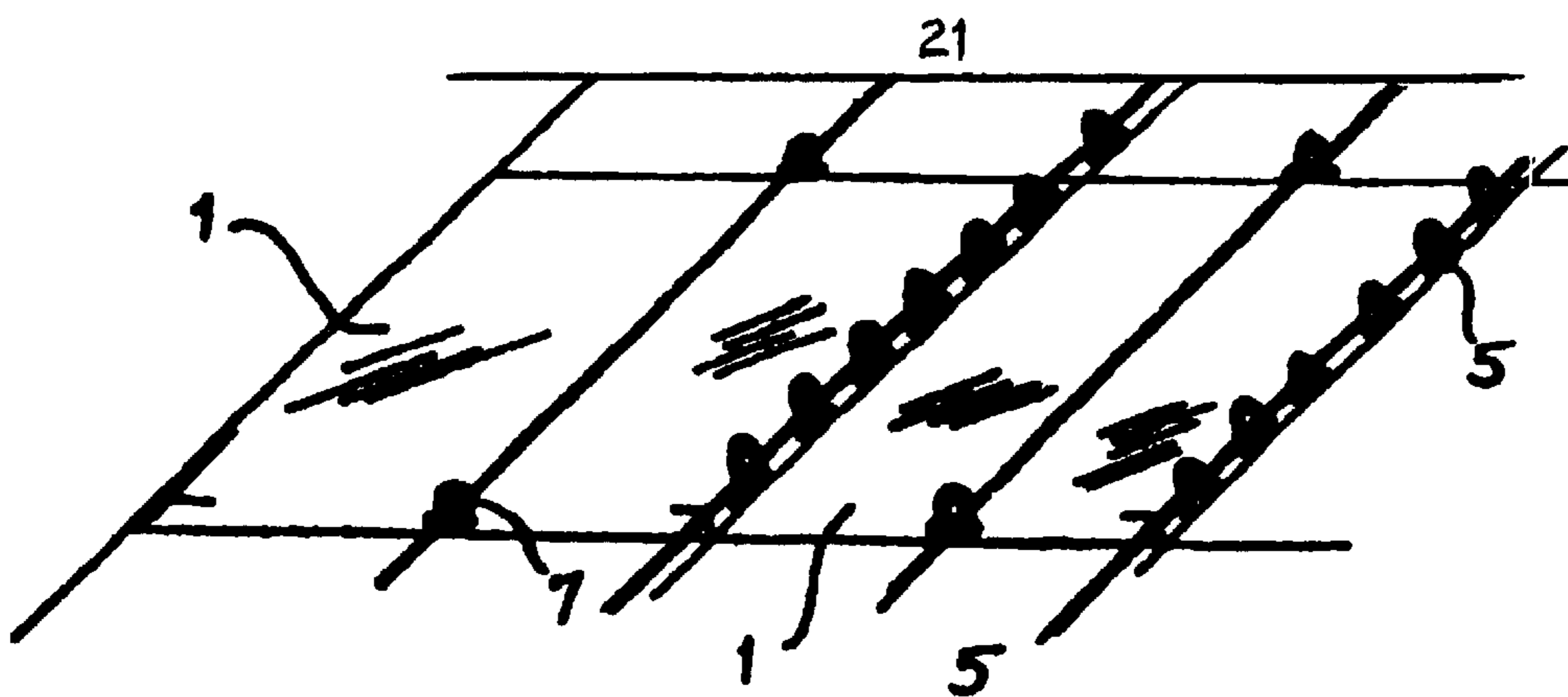


FIG. 5. amended

INSULATED REMOVABLE POND COVER

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

SUMMARY AND BACKGROUND OF THE INVENTION

Man-made, usually rectangular, settling ponds are used for holding sewage and industrial wastes, *which are examples of wastewater*. These ponds are usually covered by a large one-piece geomembrane which has gas and water collection systems and is usually not insulated. These pond covers are laid on-site and secured by an anchoring trench. Because of their size, they are difficult to remove.

The present invention is an insulated removable pond cover which is made in sections which are held together by means of a series of grommets and cables. The cables are secured to a series of concrete deadheads.

The primary advantage of the invention is that it is removable, thus allowing the pond to be dredged and re-used. Another advantage is that the insulation results in heat being retained in the pond, thus speeding biodegradation of organic material.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of two of the panels.

FIG. 2 is a top perspective view showing two full panels and parts of four other panels, starting from one edge of the pond cover on the left.

FIG. 3 is the view of FIG. 2 further showing a tank or pond and aqueous solution.

FIG. 4 is the view of FIG. 2 further showing an anchor.

FIG. 5 is the view of FIG. 2 further showing an anchoring trench.

DESCRIPTION OF THE INVENTION

The present invention is an insulated removable pond cover which is made in sections which are held together by means of a series of grommets 5 and cables 12. The cables 12 are secured to a series of concrete deadheads or anchors 20. These pond covers are laid on site and may be secured by an anchoring trench 21. The pond cover may overlie a pond, tank or other such container 22 known to those skilled in the art. Such container 22 may hold an aqueous solution 23 or other material known to those having ordinary skill in the art.

The pond cover comprises a plurality of generally rectangular casings or panel units 1 linked together. The number and size of the casings 1 will vary depending upon the size of the pond to be covered, and the casings 1 are arranged in as many rows as are needed. Generally each casing 1 will be about seven and one-half feet wide and approximately forty feet long. Each casing 1 is filled with a layer of insulation 3 and then sealed at either end and along either side by a fusion weld 4. The casings 1 are made of a geomembrane (a high density polyethylene material).

Adjacent casings 1 are linked together in overlapping spaced relationship by means of a grommet and cable system. Each casing 1 is provided with a plurality of grommets 5 at either end and along either side, positioned outside of the welded area 4 so as to not break the seal. The total number of grommets 5 per casing 1 can vary. After the grom-

mets 5 of adjacent casings 1 are lined up in vertical spaced relationship to each other, a cable 7 is passed through the openings of the grommets 5, is formed into a loop above the panels 1 and is secured in position by a cable clamp 11 attached to the cable 7 beneath the casings 1. A heavy tie-down cable 12 is then passed through all the loops of the cables 7 in the row and is secured at either end to an anchor post such as a concrete deadhead, in a conventional manner such as tying the cable 12 to a rod with a nut at either end and securing the cable 12 with a cable clamp. If wind getting underneath the cover is a problem, additional cables can be passed through the cable loops 7 perpendicular to cable 12 at either end and in the middle of the series of casings 1.

Once the pond cover has been secured in position, it will float upon the liquid in the pond, and it can be removed when the pond needs to be dredged.

We claim:

1. A pond cover comprising a plurality of panel units linked together; means for insulating said pond cover, said insulating means comprising a generally rectangular layer of insulation wherein each of said panel units is filled internally with said layer of insulation and is sealed at either end and along either side by welding; and

means for linking said panel units together and securing said pond cover in position on a pond, said linking means comprising grommets disposed along said sealed end of each of said panel units, and each of said panel units is linked in vertical spaced relationship to an adjacent panel unit by at least one cable disposed through said vertical spaced grommets and formed into a loop projecting above said panel units, and said securing means including a second cable which is disposed through [the] an entire row of said loops and is anchored at either of its end to an anchoring means.

2. The pond cover of claim 1, where the loops disposed through the grommets project both above and below the panel units.

3. The pond cover of claim 1, where the loops disposed about the second cable are disposed through said grommets.

4. A pond cover comprising:
a plurality of panel units linked together;
means for insulating the pond cover, the insulating means comprising a generally rectangular layer of insulation where each of the panel units is filled internally with the layer of insulation and is sealed at either end and along either side by welding; and

means for linking the panel units together and securing the pond cover in position on a pond, the linking means comprising grommets disposed along the sealed end of each of the panel units, and each of the panel units is linked in vertical spaced relationship to an adjacent panel unit by at least one cable disposed through the vertical spaced grommets and formed into a loop projecting above the panel units, and the securing means including a second cable which is disposed through a row of the loops and is anchored at either of its end to an anchoring means.

5. A cover and wastewater combination comprising:
wastewater that includes sewage and/or industrial waste;
at least two sealed panels positioned over the wastewater, each panel having a side characterized by an edge and a plurality of openings spaced apart from the edge; and
the openings in one of the panels being positioned above the openings in the other panel, and a fastener being disposed through at least two adjacent openings.

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6. The cover and wastewater combination of claim 5, where the panels are rectangular.

7. The cover and wastewater combination of claim 5, where the panels comprise a geomembrane.

8. The cover and wastewater combination of claim 5, where the panels are approximately seven and one-half feet wide and approximately forty feet long.

9. The cover and wastewater combination of claim 5, where each panel includes insulation material sealed inside, but not completely filling, a void in the panel.

10. The cover and wastewater combination of claim 9, where the insulation material is sealed inside each panel by a weld.

11. The cover and wastewater combination of claim 9, where the insulation material is rectangular.

12. The cover and wastewater combination of claim 5, where the panels further comprises a grommet circumscribing each opening.

13. A cover and wastewater combination comprising:
wastewater that includes sewage and/or industrial waste;
and

at least two sealed panels removably linked to each other, the panels being positioned over and in direct contact with the wastewater;

where each panel contains, but is not completely filled with, an insulation material.

14. The cover and wastewater combination of claim 13, where each panel comprises a geomembrane.

15. The cover and wastewater combination of claim 13, where the insulation material is sealed inside each panel by a weld.

16. The cover and wastewater combination of claim 13, where each panel includes multiple openings, the panels overlap, and the panels are removably linked to each other with fasteners.

17. A cover and wastewater combination comprising:
wastewater that includes sewage and/or industrial waste;
at least two sealed panels removably linked together in overlapping relationship over the wastewater; and
means for removably linking the panels in overlapping relationship, the means comprising fasteners and openings defined in each of the panels;

where the openings in one of the panels are positioned above the openings in another of the panels to form pairs of openings of different panels, and one of the fasteners is disposed through each pair of overlapping openings so as to removably link the overlapping panels.

18. A cover comprising:

a plurality of panels removably linked together, each panel comprising high density polyethylene material;
and

insulation material sealed inside each panel;

where the insulation material inside each panel does not completely fill the panel.

19. The cover of claim 18, where each panel includes multiple openings, the panels overlap, and the panels are removably linked together with fasteners.

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20. A cover comprising:

a plurality of panels configured for use over wastewater, the panels being removably linked together with fasteners disposed through overlapping openings of adjacent panel portions;

where each panel includes insulation material sealed inside, but not completely filling, a void in the panel.

21. The cover of claim 20, where each panel comprises geomembrane.

22. The cover of claim 21, where each panel includes multiple openings, the panels overlap, and the panels are removably linked together with fasteners.

23. A method of manipulating a cover comprising:

linking at least two panels such that the panels are adjacent to each other, where each panel includes insulation material that is sealed inside, but that does not completely fill, a void in the panel; and

disposing the panels over wastewater that includes sewage and/or industrial waste.

24. The method of claim 23, where each panel comprises geomembrane.

25. The method of claim 23, where the insulation material is rectangular.

26. The method of claim 23, where each panel comprises openings, and the linking includes placing a fastener through at least one pair of adjacent openings.

27. The method of claim 26, where the openings in each panel are adjacent to at least one edge of one side of the panel.

28. The method of claim 26, where the linking includes orienting the panels in an overlapping relationship.

29. The method of claim 28, further comprising:

anchoring the linked panels over the wastewater.

30. A method of covering wastewater, comprising:

disposing at least two panels over wastewater that includes sewage and/or industrial waste, where the at least two panels are linked to each other and each contains, but is not completely filled with, insulation material sealed inside it.

31. The method of claim 30, where each panel comprises geomembrane.

32. The method of claim 30, where the insulation material is rectangular.

33. The method of claim 30, where each panel comprises openings, and the linking includes placing a fastener through at least one pair of adjacent openings.

34. The method of claim 33, where the openings in each panel are adjacent to at least one edge of one side of the panel.

35. The method of claim 33, where the linking includes orienting the panels in an overlapping relationship.

36. The method of claim 35, further comprising:

anchoring the linked panels over the wastewater.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : RE41,442 E
APPLICATION NO. : 08/828330
DATED : July 20, 2010
INVENTOR(S) : Morgan et al.

Page 1 of 7

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Please delete RE41,442 in its entirety and insert RE41,442 as attached

Signed and Sealed this
Twentieth Day of September, 2011

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive style with a large initial 'D' and 'K'.

David J. Kappos
Director of the United States Patent and Trademark Office

(19) **United States**
 (12) **Reissued Patent**
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(10) **Patent Number: US RE41,442 E**
 (45) **Date of Reissued Patent: Jul. 20, 2010**

(54) **INSULATED REMOVABLE POND COVER**
 (75) **Inventors: William Deyo Morgan, Bloomington, MN (US); Michael Allan Morgan, Edina, MN (US)**
 (73) **Assignee: Industrial & Environmental Concepts, Inc., Edina, MN (US)**
 (21) **Appl. No.: 08/828,330**
 (22) **Filed: Mar. 28, 1997**

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(52) **U.S. Cl. 52/23; 52/5; 4/498; 160/231.1; 220/216; 210/DIG. 9**

(58) **Field of Classification Search 52/3-5, 52/309.9, 222, DIG. 13, 23, 408, 409, 745.06, 52/745.1, 748.1, 502.1, 63; 4/498, 503; 160/231.1; 403/291, 393; 210/DIG. 9; 220/216; 405/129.45, 405/129.9**

See application file for complete search history.

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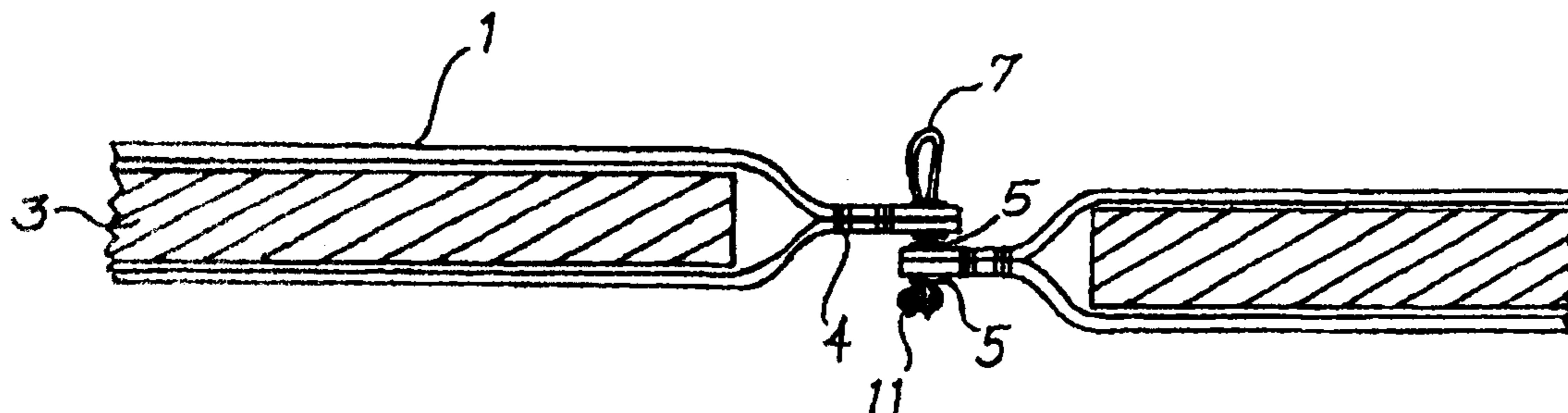
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Primary Examiner—Robert J Canfield
 (74) *Attorney, Agent, or Firm*—Fulbright & Jaworski L.L.P.

(57) **ABSTRACT**

An insulated removable pond cover for settling ponds. The pond cover comprises a plurality of sealed panel units containing insulation. The panels units are linked together by means of a system of cables which pass through grommets in the panel units.

36 Claims, 2 Drawing Sheets



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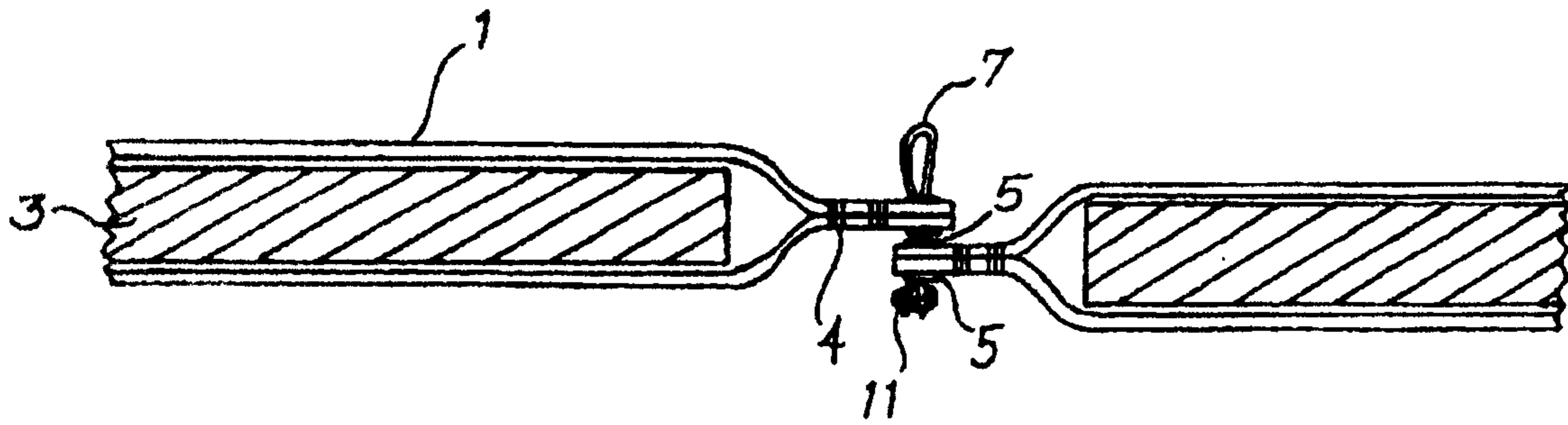


FIG. 1.

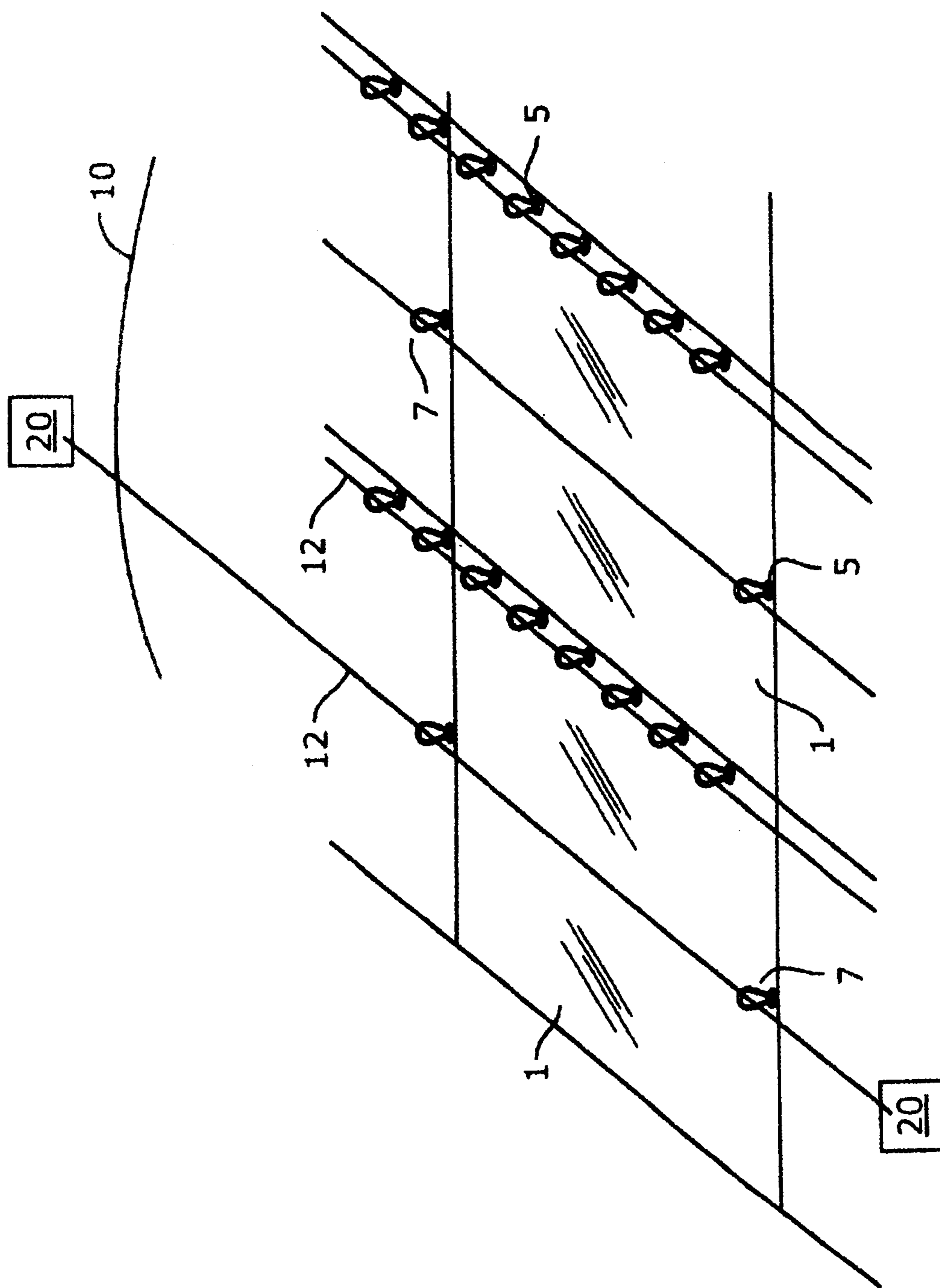


FIG. 2
AMENDED

US RE41,442 E

1

INSULATED REMOVABLE POND COVER

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

SUMMARY AND BACKGROUND OF THE INVENTION

Man-made, usually rectangular, settling ponds are used for holding sewage and industrial wastes, *which are examples of wastewater*. These ponds are usually covered by a large one-piece geomembrane which has gas and water collection systems and is usually not insulated. These pond covers are laid on-site and secured by an anchoring trench. Because of their size, they are difficult to remove.

The present invention is an insulated removable pond cover which is made in sections which are held together by means of a series of grommets and cables. The cables are secured to a series of concrete deadheads.

The primary advantage of the invention is that it is removable, thus allowing the pond to be dredged and re-used. Another advantage is that the insulation results in heat being retained in the pond, thus speeding biodegradation of organic material.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of two of the panels.

FIG. 2 is a top perspective view showing two full panels and parts of four other panels, starting from one edge of the pond cover on the left.

DESCRIPTION OF THE INVENTION

The pond cover comprises a plurality of generally rectangular casings or panel units 1 linked together. The number and size of the casings 1 will vary depending upon the size of the pond 10 to be covered, and the casings 1 are arranged in as many rows as are needed. Generally each casing 1 will be about seven and one-half feet wide and approximately forty feet long. Each casing 1 is filled with a layer of insulation 3 and then sealed at either end and along either side by a fusion weld 4. The casings 1 are made of a geomembrane (a high density polyethylene material).

Adjacent casings 1 are linked together in overlapping spaced relationship by means of a grommet and cable system. Each casing 1 is provided with a plurality of grommets 5 at either end and along either side, positioned outside of the welded area 4 so as to not break the seal. The total number of grommets 5 per casing 1 can vary. After the grommets 5 of adjacent casings 1 are lined up in vertical spaced relationship to each other, a cable 7 is passed through the openings of the grommets 5, is formed into a loop above the panels 1 and is secured in position by a cable clamp 11 attached to the cable 7 beneath the casings 1. A heavy tie-down cable 12 is then passed through all the loops of the cables 7 in the row and is secured at either end to an anchor post 20 such as a concrete deadhead, in a conventional manner such as tying the cable 12 to a rod with a nut at either end and securing the cable 12 with a cable clamp. If wind getting underneath the cover is a problem, additional cables can be passed through the cable loops 7 perpendicular to cable 12 at either end and in the middle of the series of casings 1.

Once the pond cover has been secured in position, it will float upon the liquid in the pond, and it can be removed when the pond needs to be dredged.

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We claim:

1. A pond cover comprising a plurality of panel units linked together; means for insulating said pond cover, said insulating means comprising a generally rectangular layer of insulation wherein each of said panel units is filled internally with said layer of insulation and is sealed at either end and along either side by welding; and

means for linking said panel units together and securing said pond cover in position on a pond, said linking means comprising grommets disposed along said sealed end of each of said panel units, and each of said panel units is linked in vertical spaced relationship to an adjacent panel unit by at least one cable disposed through said vertical spaced grommets and formed into a loop projecting above said panel units, and said securing means including a second cable which is disposed through [the] an entire row of said loops and is anchored at either of its end to an anchoring means.

2. *The pond cover of claim 1, where the loops disposed through the grommets project both above and below the panel units.*

3. *The pond cover of claim 1, where the loops disposed about the second cable are disposed through said grommets.*

4. A pond cover comprising:
a plurality of panel units linked together;
means for insulating the pond cover, the insulating means comprising a generally rectangular layer of insulation where each of the panel units is filled internally with the layer of insulation and is sealed at either end and along either side by welding; and

means for linking the panel units together and securing the pond cover in position on a pond, the linking means comprising grommets disposed along the sealed end of each of the panel units, and each of the panel units is linked in vertical spaced relationship to an adjacent panel unit by at least one cable disposed through the vertical spaced grommets and formed into a loop projecting above the panel units, and the securing means including a second cable which is disposed through a row of the loops and is anchored at either of its end to an anchoring means.

5. A cover and wastewater combination comprising:
wastewater that includes sewage and/or industrial waste;
at least two sealed panels positioned over the wastewater, each panel having a side characterized by an edge and a plurality of openings spaced apart from the edge; and
the openings in one of the panels being positioned above the openings in the other panel, and a fastener being disposed through at least two adjacent openings.

6. *The cover and wastewater combination of claim 5, where the panels are rectangular.*

7. *The cover and wastewater combination of claim 5, where the panels comprise a geomembrane.*

8. *The cover and wastewater combination of claim 5, where the panels are approximately seven and one-half feet wide and approximately forty feet long.*

9. *The cover and wastewater combination of claim 5, where each panel includes insulation material sealed inside, but not completely filling, a void in the panel.*

10. *The cover and wastewater combination of claim 9, where the insulation material is sealed inside each panel by a weld.*

11. *The cover and wastewater combination of claim 9, where the insulation material is rectangular.*

12. *The cover and wastewater combination of claim 5, where the panels further comprises a grommet circumscribing each opening.*

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13. A cover and wastewater combination comprising:
wastewater that includes sewage and/or industrial waste;
and

at least two sealed panels removably linked to each other,
the panels being positioned over and in direct contact
with the wastewater;

where each panel contains, but is not completely filled
with, an insulation material.

14. The cover and wastewater combination of claim 13,
where each panel comprises a geomembrane.

15. The cover and wastewater combination of claim 13,
where the insulation material is sealed inside each panel by
a weld.

16. The cover and wastewater combination of claim 13,
where each panel includes multiple openings, the panels
overlap, and the panels are removably linked to each other
with fasteners.

17. A cover and wastewater combination comprising:
wastewater that includes sewage and/or industrial waste;
at least two sealed panels removably linked together in
overlapping relationship over the wastewater; and
means for removably linking the panels in overlapping
relationship, the means comprising fasteners and open-
ings defined in each of the panels;

where the openings in one of the panels are positioned
above the openings in another of the panels to form
pairs of openings of different panels, and one of the
fasteners is disposed through each pair of overlapping
openings so as to removably link the overlapping pan-
els.

18. A cover comprising:
a plurality of panels removably linked together, each
panel comprising high density polyethylene material;
and

insulation material sealed inside each panel;
where the insulation material inside each panel does not
completely fill the panel.

19. The cover of claim 18, where each panel includes
multiple openings, the panels overlap, and the panels are
removably linked together with fasteners.

20. A cover comprising:
a plurality of panels configured for use over wastewater,
the panels being removably linked together with fasten-
ers disposed through overlapping openings of adjacent
panel portions;

where each panel includes insulation material sealed
inside, but not completely filling, a void in the panel.

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21. The cover of claim 20, where each panel comprises
geomembrane.

22. The cover of claim 21, where each panel includes
multiple openings, the panels overlap, and the panels are
removably linked together with fasteners.

23. A method of manipulating a cover comprising:
linking at least two panels such that the panels are adja-
cent to each other, where each panel includes insulation
material that is sealed inside, but that does not com-
pletely fill, a void in the panel; and

disposing the panels over wastewater that includes sew-
age and/or industrial waste.

24. The method of claim 23, where each panel comprises
geomembrane.

25. The method of claim 23, where the insulation material
is rectangular.

26. The method of claim 23, where each panel comprises
openings, and the linking includes placing a fastener
through at least one pair of adjacent openings.

27. The method of claim 26, where the openings in each
panel are adjacent to at least one edge of one side of the
panel.

28. The method of claim 26, where the linking includes
orienting the panels in an overlapping relationship.

29. The method of claim 28, further comprising:
anchoring the linked panels over the wastewater.

30. A method of covering wastewater, comprising:
disposing at least two panels over wastewater that
includes sewage and/or industrial waste, where the at
least two panels are linked to each other and each
contains, but is not completely filled with, insulation
material sealed inside it.

31. The method of claim 30, where each panel comprises
geomembrane.

32. The method of claim 30, where the insulation material
is rectangular.

33. The method of claim 30, where each panel comprises
openings, and the linking includes placing a fastener
through at least one pair of adjacent openings.

34. The method of claim 33, where the openings in each
panel are adjacent to at least one edge of one side of the
panel.

35. The method of claim 33, where the linking includes
orienting the panels in an overlapping relationship.

36. The method of claim 35, further comprising:
anchoring the linked panels over the wastewater.

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