

Nov. 21, 1967

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3,353,548

ANCHORING FLEXIBLE SHEETING

Filed Aug. 24, 1965

2 Sheets-Sheet 1

FIG-1

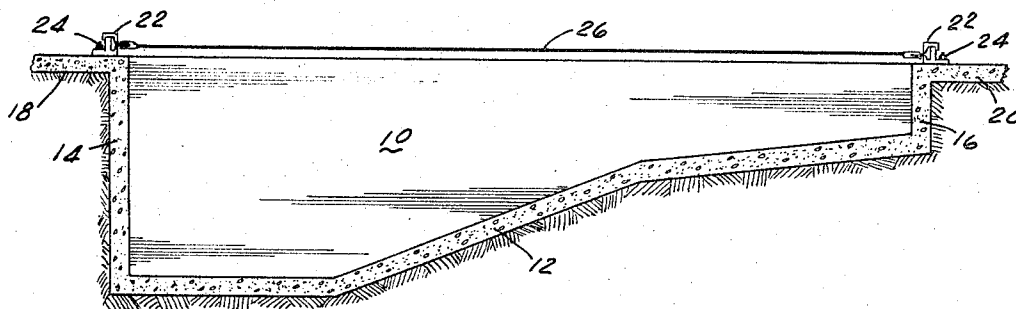


FIG-2

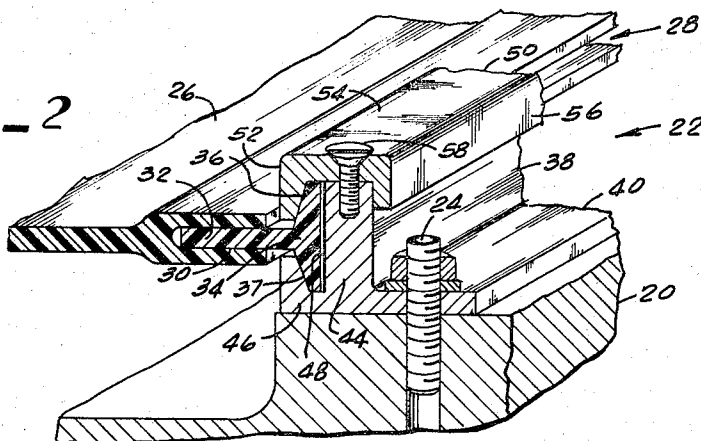
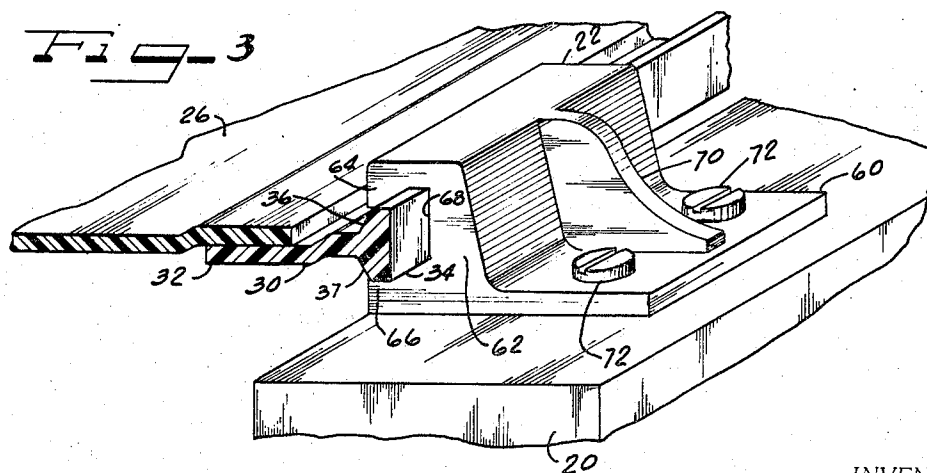


FIG-3



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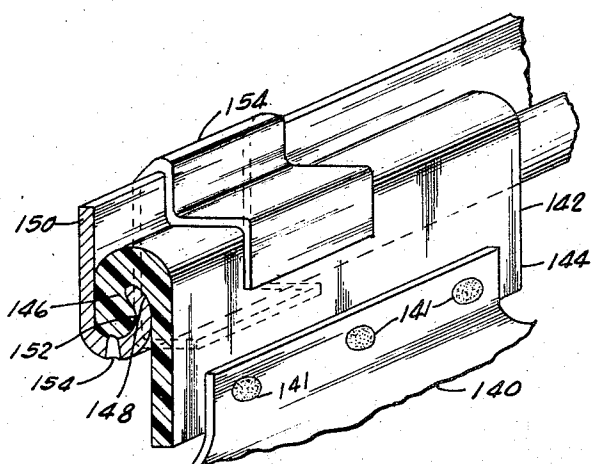
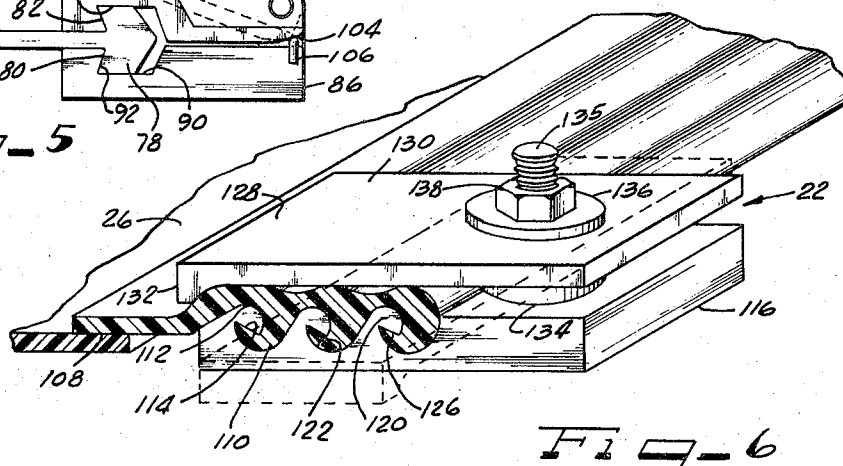
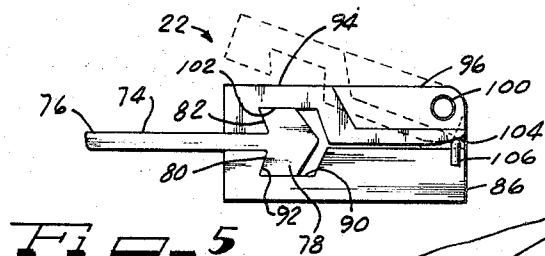
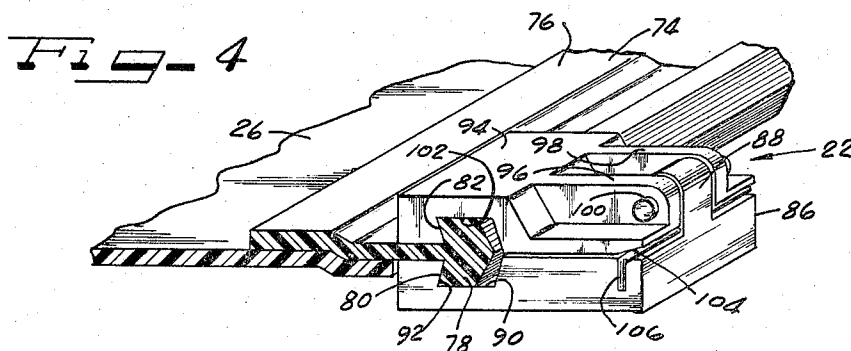
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ANCHORING FLEXIBLE SHEETING

Filed Aug. 24, 1965

2 Sheets-Sheet 2



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3,353,548

ANCHORING FLEXIBLE SHEETING

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5 Claims. (Cl. 135-5)

This invention relates generally to fasteners for securing the ends of a sheet to an anchoring surface and more particularly to such fasteners which allow releasable securement of the ends of a sheet to an anchoring surface by relative movement of a portion of the fastener with respect to another portion thereof.

This invention has particular application in the securing of sheets of materials such as vinyl, polyethylene or coated canvasses to the ground or to a hard surface. The invention also contemplates a holder for pliable plastics, fabric screens, or covers used in households, public rooms, airplanes, or boats, etc. Protective canvasses or sheets for swimming pools or other areas to be protected may be releasably secured to an anchoring surface by means of the present invention.

The sheets or canvasses which protect the areas must be easily attached to their anchoring surfaces and must be supported stably and securely and yet be easily removed. Many other environments require improved sheet-anchoring means such as for attaching protective canvasses over a boat or machinery, attaching tent structures to an earth anchor, or protecting building sites or other areas where the canvass must be easily attached and removed with a simplified reliable attachment device.

It is, accordingly, an object of the present invention to provide an improved anchoring means for attaching a flexible sheet to a rigid anchor which accommodates rapid and easy attachment and removal and which permits repeated reuse.

Another object of the present invention is to provide a 2-piece sheet holder which allows removal of the sheet therefrom in a simple and efficient manner.

Still another object of the present invention is to provide a 2-piece sheet holder wherein one piece is releasable with respect to the other piece.

These and other objects, features and advantages of the present invention will be more fully realized and understood from the following detailed description when taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a sectioned elevational view of a swimming pool illustrating a protective sheet anchored in place by a fastener embodying the principles of the present invention;

FIGURE 2 is a view in perspective shown partially in section and broken away and illustrating one preferred embodiment of the present invention;

FIGURE 3 is a perspective view shown partially in section and broken away and illustrating an alternate embodiment of the present invention;

FIGURE 4 is a perspective view shown partially in section and broken away and illustrating still another embodiment of the present invention;

FIGURE 5 is a side elevational view of the fastener illustrated in FIGURE 4 showing the relative position of one portion of the fastener with respect to the other portion thereof;

FIGURE 6 is a perspective view partially in section and broken away of still another embodiment of the present invention; and

FIGURE 7 is a perspective view partially in section and broken away illustrating yet another embodiment of the present invention which may be employed for hanging and supporting curtain structures.

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As shown on the drawings:

Like reference numerals throughout the various views of the drawings are intended to designate the same or similar structures.

A swimming pool generally designated with the reference numeral 10 is illustrated in FIGURE 1 as having a bottom wall 12 and side walls 14 and 16. Extending from the side walls 14 and 16 at ground level are concrete curves 18 and 20 constituting anchoring surfaces.

A fastener 22 is secured to each of the anchoring surfaces 18, 20 by means of bolts 24. A sheet 26 of covering material such as plastic or fabric extends over the swimming pool 10 and is secured at respective edges thereof by means of the fasteners 22. It is to be understood that the fasteners 22 may each extend the entire length of the sheet 26 or may be relatively short in comparison to the length of the sheet 26, and a plurality of such short units may be employed for fastening one edge of the sheet 26 to the anchoring surfaces 18, 20.

FIGURE 2 illustrates, in greater detail, an edge portion of the sheet 26 releasably secured by the fastener 22 to the anchoring surface 20. As shown therein, the sheet 26 includes an enlarged and grooved edge 28, which edge may be formed as a part of the sheet 26 or may be bonded to the sheet 26 as desired. An attachment member 30 shaped in the form of a T includes a web portion 32 secured within the groove 28 and a head portion 34. The edge attachment illustrated in FIGURE 2 is only exemplary of one of a number of possible arrangements for securing the attachment member 30 to the sheet 26. The attachment member 30 can be bonded directly to an edge of the sheet 26 and the grooved edge 28 can be eliminated, if desired. The head portion 34 includes a pair of shoulders 36 and 37 facing substantially away from an edge of the sheet 26.

The fastener 22 includes an anchoring member 38 which is secured to the anchoring surface 20 by means of the bolt 24. The anchoring member 38 includes an anchoring flange 40 through which the bolt 24 extends into the anchoring surface 20. The anchor member 38 also includes a back supporting wall 44 and a retaining flange 46 each extending upwardly from the anchoring flange 40. The wall 44 and flange 46 form a groove 48 for receiving a portion of the attachment member 30. An inner surface of the retaining flange 46 within the groove 48 is abutted by the shoulder 37 of the attachment member 30.

The fastener 22 also includes a clamping member 50 having a retaining flange 52 which forms another surface of the groove 48 in cooperation with the wall 44 and the flange 46. An inner surface of the flange 52 within the groove 48 abuts with the shoulder 36 of the attachment member 30. The retaining flange 52 extends downwardly from a top wall 54 of the clamping member 50 which is supported on the wall 44 of the anchor member 38. A back wall 56 extends downwardly from the top wall 54 of the clamping member 50 and abuts with a rear surface of the wall 44. The clamping member 50 is secured to the anchor member 38 by means of a screw 58 extending through the top wall 54 and into threaded engagement with the back supporting wall 44.

As previously mentioned, the fastener 22 illustrated in FIGURE 2 may be one continuous unit extending the entire length of the sheet 26 or a plurality of smaller units may be employed along the length of an edge of the sheet 26. It can be readily appreciated from the illustration of FIGURE 2 that the fastener 22 of the present invention provides several novel results in the securement of a sheet to an anchoring surface. For instance, if a plurality of relatively short fasteners 22 are provided for retaining an edge of the sheet 26, the sheet 26 may be manipulated between each of the fasteners 22 by in-

dividually loosening the clamping member 50 with respect to the anchoring member 38. That is, if a plurality of fasteners 22 are employed to secure one edge of the sheet 26 to an anchoring surface, one of the fasteners 22 may be loosened to manipulate the sheet 26 while the other fasteners 22 along the same edge of the sheet 26 maintain their gripping action on the attachment 30. In addition, if it is desired to lift a portion of the sheet 26 while retaining the other portion thereof clamped at edges thereof, a number of the fasteners 22 may be released while the other fasteners 22 maintain their holding action on the sheet 26. It can be readily appreciated that if it is desired to shift the sheet 26 laterally within the grooves 48 of the fasteners 22, the screws 58 can be slightly loosened and the sheet 26 moved laterally as desired.

As shown in FIGURE 2, the web portion 32 of the attachment member 30 is disposed within the groove 28 of the sheet 26. The web portion 32 may be bonded into the groove 28 by any desired process. The attachment member 30 may be an extruded soft plastic or, if desired, may be fabricated of other materials ranging from a relatively hard plastic to a metal. The fastener 22 is preferably fabricated of metal or hard plastic.

The fastener 22 illustrated in FIGURE 2 may be fabricated by extrusion if desired. However, in order to provide a more stable and rigid anchoring means, the fastener 22 may be fabricated by die casting an aluminum or plastic as is illustrated in FIGURE 3. The die cast fastener 22 of FIGURE 3 is of one-piece construction, but similar in shape to the fastener 22 illustrated in FIGURE 2. In FIGURE 3, the sheet 26 is secured by means of bonding or other suitable means to the attachment member 30 shaped in the form of a T and including a web portion 32 and a head portion 34. The head portion 34 includes a pair of shoulders 36 and 37 facing substantially away from an edge of the sheet 26.

The fastener 22 includes an anchor flange 60 and a back supporting wall 62 extending upwardly from the flange 60. A pair of retaining flanges 64 and 66 extend from the back supporting wall 62 and have inner surfaces thereof engaging shoulders 36, 37 respectively. The retaining flanges 64, 66 with the back supporting wall 62 form a groove 68 for receiving the head portion 34 of the attachment member 30. A rib 70 extends from the back wall 62 to the anchor flange 60 for adding support to the fastener 22. A pair of screws 72 extend through the anchor flange 60 and engage the anchoring surface 20 for securing the fastener 22 thereto.

Another embodiment of the present invention is illustrated in FIGURE 4 and incorporates a quick-release mechanism for removing the sheet 26 from the fastener 22 without any great difficulty. As shown in FIGURE 4, an attachment member 74 includes a web portion 76 secured by bonding or other suitable means to an edge of the sheet 26. The attachment member 74 also includes a head portion 78 in the shape of an arrowhead and provided with shoulders 80 and 82 facing the edge of the sheet 26 and slightly facing one another to provide the arrowhead-type configuration. The fastener 22 includes an anchor member 86 which is disposed for being secured to an anchor surface by suitable fastening means. A boss 88 extends upwardly from a rear portion of the anchor member 86 and a groove 90 is disposed forwardly thereof. The groove 90 includes an inner surface 92 disposed for engaging the shoulder 80 on the attachment member 74. A clamping member 94 includes a pair of bosses 96 and 98 disposed on opposite sides of the boss 88. A pivot pin 100 extends through the bosses 88, 96, and 98 for pivotally supporting the clamping member 94 with respect to the anchor member 86. The clamping member 94 includes a groove 102 in a bottom surface thereof which also includes a surface for abutting with the shoulder 82 on the attachment member 76. The grooves 90

and 102 provide a channel for the head portion 78 of the attachment member 74.

A bottom surface of the clamping member 94 includes a bevelled portion 104 which allows pivotal movement of the clamping member 94 with respect to the anchor member 86 during removal of the attachment member 74 from the respective grooves 90, 102. A retaining pin 106 extends through the boss 88 and is disposed in contacting relationship with the bevelled surface 104. Therefore, when the retaining pin 106 is in the position shown, the clamping member 94 cannot be pivoted with respect to the anchor member 86. This relationship of the parts is illustrated more clearly in FIGURE 5. As shown therein, the retaining pin 106 does not allow relative pivotal movement of the clamping member 94 with respect to the anchor member 86 when it is inserted through the hole provided in the boss 88. However, when the retaining pin 106 is withdrawn from the hole provided in the boss 88, the clamping member 94 may be pivotally moved with respect to the anchor member 86 to allow removal of the attachment member 74.

An alternate embodiment of the fastener structure is illustrated in FIGURE 6 wherein the sheet 26 is attached to a web portion 108 terminating in a head portion having a plurality of ribs 110 forming grooves 112. The ribs 110 are formed in the shape of a hook and define shoulders 114 facing inwardly toward the grooves 112. The fastener 22 includes an anchor member 116 having a plurality of ribs 120 extending therefrom and forming grooves 122 therein. The ribs 120 of the anchor member 116 are conformably shaped to the ribs 110 of the sheet 26 and include a shoulder 126 disposed for engaging the shoulders 114 on the ribs 110. This interlocking engagement of the ribs 110, 120 supports the lateral forces exerted on the sheet 26.

A clamping member 128 includes a top wall 130 which is disposed for extending over the ribs 110 of the sheet 26 and includes an overlapping flange 132 for engaging the web portion 108 adjacent the innermost rib 110. Secured to the anchor member 116 is a bushing 134 which extends upwardly therefrom to a bottom surface of the clamping member 128. A bolt 135 extends upwardly from the bushing 134 through an aperture provided in the top wall 130 of the clamping member 128. A washer 136 is disposed between a nut 138 and the top wall 130 of the clamping member 128 for retaining the clamping member 128 in fixed relationship with the anchor member 116. The bushing 134 maintains a fixed spaced distance between the anchor member 116 and the clamping member 128. When it is desired to remove the web portion 108 from the fastener 22, the clamping member 128 may be rotated by loosening the nut 138 on the bolt 135 to the position shown by the dashed lines in FIGURE 6.

Still another embodiment of the present invention is illustrated in FIGURE 7 which is particularly adapted for hanging non-slidable screens or curtains such as is employed in bathhouses and shower rooms. As illustrated in FIGURE 7, a sheet 140 is bonded by means of spot welds 141 or other suitable means to an attachment member 142. The attachment member 142 includes a web portion 144 and a head portion 146 extending therefrom and forming a groove 148 therebetween. An anchor rod 150 which is disposed for being supported at opposite ends thereof includes a hook portion 152 conformably shaped to the groove 148 and extending substantially around the head portion 146 of the attachment member 142. The hook portion 152 includes holes 154 for allowing removal of water from the channel formed thereby when the device is employed as a shower curtain holder. A spring clamp 154 extends around the anchor rod 150 and around the head portion 146 of the attachment member 142 and retains the head portion 146 within the channel formed by the hook member 152.

It can be readily appreciated that the curtain support illustrated in FIGURE 7 can be employed for the conven-

tional rod type of curtain support commonly employed for supporting curtains and other types of screens. Since the anchor rod 150 and the attachment member 142 of the present invention may be extruded or molded of plastic, a relatively inexpensive curtain support can be provided by the use of the present invention.

The principles of the invention explained in connection with the specific exemplifications thereon will suggest many other applications and modifications of the same. It is accordingly desired that in construing the breadth of the appended claims they shall not be limited to the specific details shown and described in connection with the exemplifications thereof.

I claim as my invention:

1. A fastener for releasably securing the ends of a sheet to an anchoring surface wherein an end of the sheet includes an enlarged portion, said fastener comprising:

(a) an anchor member formed of a relatively flat plate having one surface conformably shaped to the anchoring surface and having a groove in one end thereof,

(b) a clamping member formed of a relatively flat plate having a groove in one end thereof, the grooves of said anchor member and said clamping member forming a channel for the enlarged portion of the sheet, means at the other ends of said members for pivoting one with respect to the other and spaced from said channel,

(c) releasable means for impeding pivotal movement of said clamping member with respect to said anchor member, and means for securing said base to the anchoring surface, whereby said members abut against each other when engaging the enlarged portion in said channel.

2. The fastener as defined in claim 1 wherein said releasable means includes a pin extending between juxtaposed surfaces of said clamping member and of said anchor member respectively.

3. The fastener as defined in claim 1 wherein said

clamping member and said anchor member each include a surface, the surfaces being adjacent one another and movable toward one another during pivotal movement of said members to release the enlarged portion of the sheet, and said releasable means including a pin disposed between and in engagement with said surfaces.

4. A fastener as defined in claim 1, wherein the enlarged portion of the sheet is formed with a pair of substantially flat surfaces each extending substantially orthogonally from opposite surfaces of the sheet, and wherein the grooves of each of said members are formed with a substantially flat surface which is disposed for engaging a corresponding surface of the enlarged portion to oppose withdrawal of the enlarged portion from the channel.

5. A fastener as defined in claim 1, wherein the enlarged portion of the sheet is substantially in the shape of an arrowhead to form a pair of shoulders facing toward the sheet, and wherein a portion of the channel formed by the grooves of said members is conformably shaped to and disposed for engaging said shoulders to oppose withdrawal of the enlarged portion from the channel.

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