United States Patent [19]

Brouillette

[11] **3,768,265**

[45] **Oct. 30, 1973**

[54] **COFFERDAM**

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[22] Filed: **Sept. 27, 1971**

[21] Appl. No.: **184,092**

[52] **U.S. Cl.** **61/34**

[51] **Int. Cl.** **E02b 1/00**

[58] **Field of Search** 61/34, 28, 68, 63, 61/29

[56] **References Cited**

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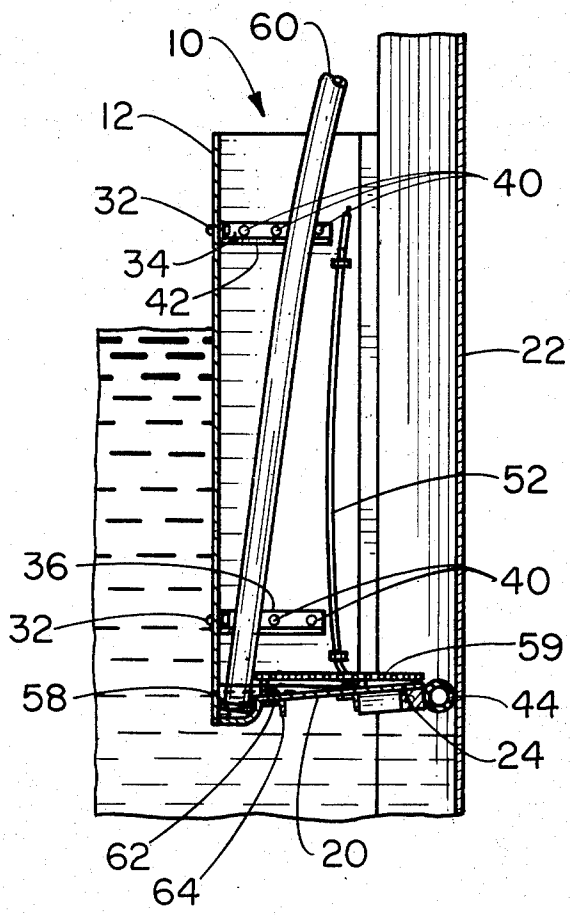
[57] **ABSTRACT**

An improved cofferdam having an inflatable rubberized seal for use along the contact edge thereof. Such seal enables the cofferdam to uniformly fit in a watertight relationship wherever positioned across the face of a piling or other submerged structure.

5 Claims, 5 Drawing Figures



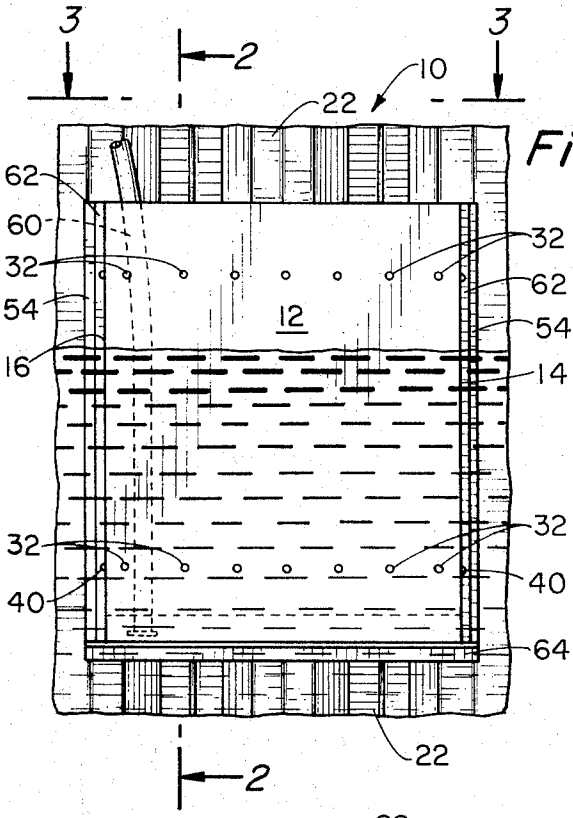


Fig. 1.

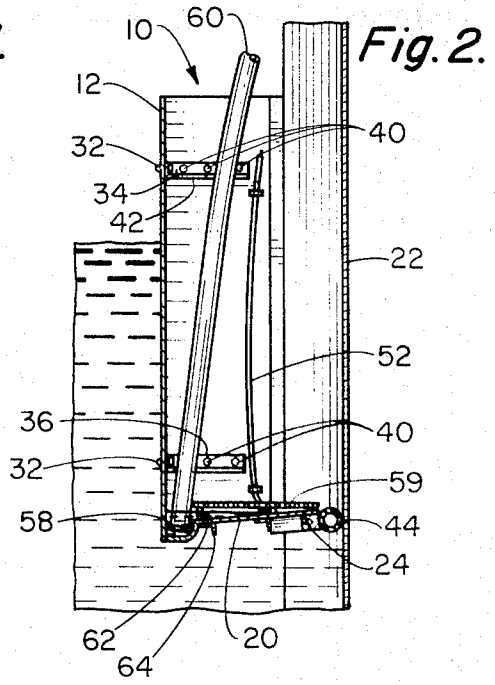


Fig. 2.

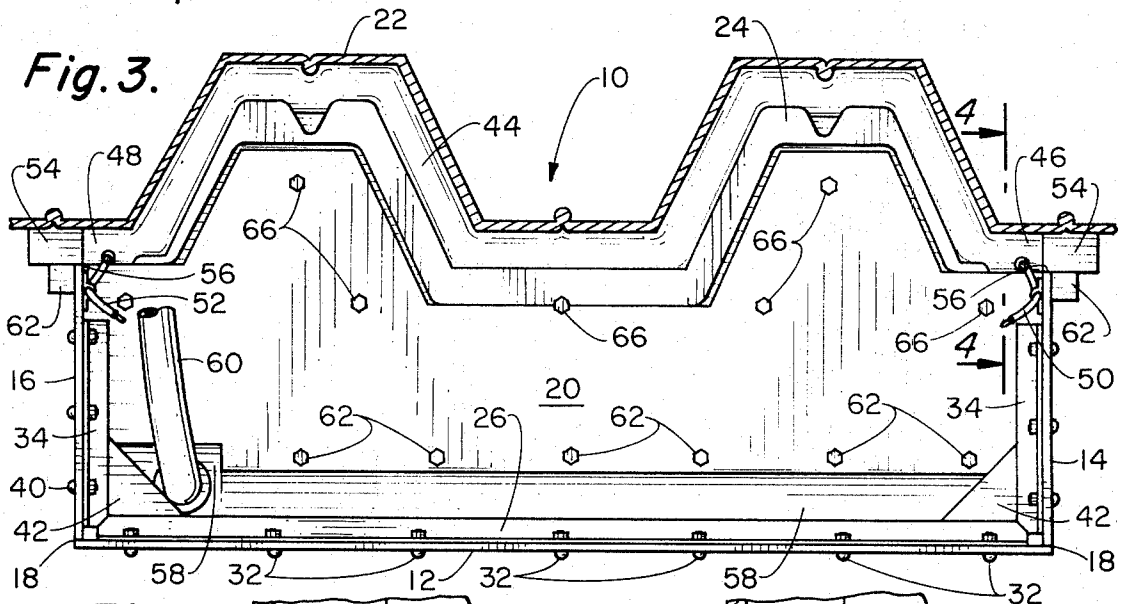


Fig. 3.

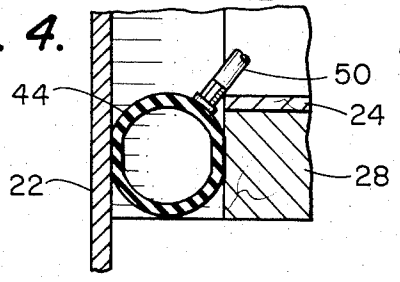


Fig. 4.

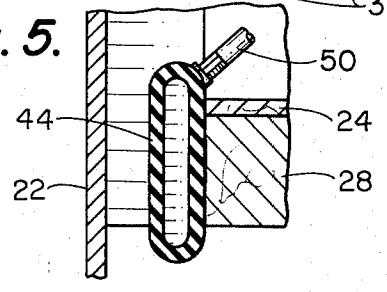


Fig. 5.

COFFERDAM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to cofferdams and more particularly to cofferdams having a sealing means across the contact edges thereof.

2. Description of the Prior Art

Cofferdams have been used as a means of temporarily keeping water away from a submerged structure so that adequate maintenance thereof can be provided. However, because the prior art cofferdams have not been sufficiently adaptable to fit against many varying shaped underwater surfaces they have been unable to prevent water leakage, and as a result, maintenance of such surfaces is very difficult and very costly. Accordingly, little maintenance thereof has been resorted to except for patching abraded areas. Occasionaly, a very costly cofferdam will be tailor-made to fit a specific surface if extensive repairs are needed.

SUMMARY OF THE INVENTION

The foregoing as well as other attendant disadvantages have been overcome in the present invention by employing an inflatable rubberized seal along the contact edge of the cofferdam. The cofferdam itself being constructed of any suitable material and being in the form of a three sided box with the fourth or open side providing the contact edge along which the inflatable rubberized seal is affixed. The floor may be slightly slanted in a rearward direction with a trough positioned at the back area so that any slight leakage or seepage of water in the cofferdam will accumulate in the trough where it is easily removed. Furthermore, a multitude of different shaped front edges may be provided which are interchangeably bolted to the lower contact edge of the device. Thus the present cofferdam is adaptable to all surfaces regardless of configuration.

STATEMENT OF THE OBJECTS OF THE INVENTION

Thus a primary object of this invention is to provide a cofferdam having an inflatable and rubberized seal along the contact edges thereof.

Another object is to provide a cofferdam with a slanting floor and having a shallow trough at the rear to enable easy collection and disposal of seepage water.

Still another object is to provide a cofferdam with interchangeable lower front edges to render the cofferdam adaptable to all structure configurations against which it may be implaced.

Another object is to provide a cofferdam simple in construction, reliable in operation and economical to manufacture.

Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation showing the invention in position below the waterline and adjacent a piling.

FIG. 2 is a sectional view along the line 2—2 of FIG. 1 showing a tilted floor with a trough at the rear and a platform to provide a level working surface.

FIG. 3 is an enlarged sectional view along the line 3—3 of FIG. 1 showing the inflatable tube in position against the surface to be repaired.

FIG. 4 is an enlarged sectional view along the line 4—4 of FIG. 3 showing the tube in an expanded condition to provide an adequate seal.

FIG. 5 is a view similar to FIG. 4 with the tube in a compressed state.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present novel cofferdam or watertight device for making repairs below the waterline has been developed primarily for use adjacent steel sheet piling surfaces although it also may be employed adjacent other surfaces where water must be temporarily kept away in order to provide periodic maintenance thereof.

An important aspect of this invention is a self-adjusting inflatable seal which fits snuggly around any irregular surface thereby giving great versatility to the present cofferdam. Without the seal system described in detail below, each cofferdam would have to be tailor-fitted to each position across the face of the piling or any other submerged surface.

The cofferdam **10** of the present invention comprises essentially an elongated rear portion **12** and two parallel sides **14** and **16** attached along one vertical edge **18** to each end of rear portion **12** substantially as shown in FIGS. **2** and **3**. The floor **20** is attached to the rear portion **12** and to sides **14** and **16** by any feasible means depending on the material employed in the manufacture thereof. Such attaching means may include bolting, welding or even gluing. It will be noted that the front edge **24** of floor **20** is shaped to fit loosely the configuration of the piling **22** or other surface against which the cofferdam **10** is to be positioned. The bolts **62** hold the braces **64** against the bottom surface of the floor **20** and add additional strength. However, bolts **66** are adapted to hold a mounting brace **28** under the front edge **24** in a firm immovable position so as to add rigidity thereto and to provide a mounting base for tube **44** described hereinafter.

As illustrated, angle iron braces **26** are attached to the rear portion **12** by a series of bolts **32** and are employed for reinforcement purposes. Similar angle iron braces **34** and **36** attached by bolts **40** also serve as reinforcement means for sides **14** and **16**. Triangular shaped metal gussets **42** are employed in the corners between the rear portion **12** and sides **14** and **16** to reinforce each angle iron as shown. The gussets **42** also act as steps by which the cofferdam may be entered and exited.

It is stressed that an important part of this invention and a key to its success is an inflatable tube **44** attached to the front edge **24** of floor **20** by any suitable bonding material including an epoxy glue. The inflatable tube **44** is a thick heavy sponge rubber structure having an inside diameter of 1⅝ inches with a three-fourths inch sidewall thickness. Tube **44** is connected at each lateral end **46** and **48** to a pair of inflating tubes **50** and **52**. A thick flexible material **54** having rubbery characteristics is attached to the vertical front contact edges **56** of sides **14** and **16**. It is wide enough, not less than 5 inches, to cover the said front edges **56** and is at least 3 inches in thickness. The frame element **62** attached to the front outer portion of edge **56** provides a backing structure for the flexible material **54**. Thus, the tube **44**

and the flexible material **54** furnish an inflatable, expandable and compressible seal along the contact edge of cofferdam **10** and provide a seal at any position along the face of the piling or other surface against which the cofferdam **10** is positioned. Where the fit is snug the tube **44** and flexible material **54** are compressed somewhat and where the fit is poor the tube **44** and rubber material **54** expand to produce a water-tight seal.

An alternative embodiment is to provide the floor **20** with a slight angle tilt in a rearward direction and incorporate a shallow trough **58** at the back of floor **20** adjacent the bottom edge of rear portion **12.** A meshed platform **59** may be positioned on the floor **20,** as shown, to provide a level working surface. Thus, if any seepage should occur, it will accumulate in the trough and can easily be removed by a suction hose **60** attached to a pump arrangement not illustrated.

Another embodiment is to provide a multiplicity of varying shaped front edges **24** which may be interchangeably attached to floor **20** such as by bolting. In this manner the cofferdam **10** can be adapted to fit against any surface regardless of the configuration.

The usual way of securing the cofferdam **10** against the sheet piling or other surface is to drill several holes in the piling, thread the same and bolt the cofferdam **10** into place. An alternative method for securing the cofferdam **10** against the piling is to use turnbuckles. However, these are only suggested securing methods. Any method feasible in view of the type of structure against which the cofferdam **10** is affixed may be employed.

The length and height of the cofferdam **10** may be any desirable size and can be made of any suitable material including plywood, aluminum and steel. The angle iron reinforcing braces and gussets may be altered without changing the concept of this invention.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

I claim:

1. A watertight device for making periodic repairs to objects below the waterline comprising:

a floor having a slight inclination of not over 5° toward the back of said device with a trough positioned at the rear transversely across said floor to collect seepage water;

an elongated rear portion attached at the lower rear edge to said floor;

a pair of spaced and parallel sides attached along one vertical edge to said rear portion and along the lower edge to said floor;

means to strengthen both the rear portion and the parallel sides;

a self-adjusting inflatable seal attached to the contact edge of said floor and a flexible material attached to each vertical contact edge of said parallel sides.

2. The device of claim **1** wherein the floor, rear area and sides are constructed of a material selected from the group consisting of plywood, aluminum and steel.

3. The device of claim **1** wherein the inflatable seal includes a sponge rubber tubing being 1⅝ inches inside diameter and three-fourths inch sidewall thickness; and the rubber material attached to the vertical con-tact edges is about 5 inches in width and **3** inches in thickness.

4. The device of claim **1** wherein the rubber material attached to said vertical contact edges is selected from the group consisting of neoprene and urethane.

5. The device of claim **1** wherein the front edge of said floor is removable so that a multiplicity of varying shaped edges may be provided to permit the device to fit against any surface regardless of configuration.

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