United States Patent [19]

Ost

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[54] **FLOATABLE SUCTION HEAD**

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[51] **Int. Cl.** **F04b 21/00**

[58] **Field of Search** ... 417/61; 210/242; 134/167 R, 134/168 R

[56] **References Cited**

UNITED STATES PATENTS

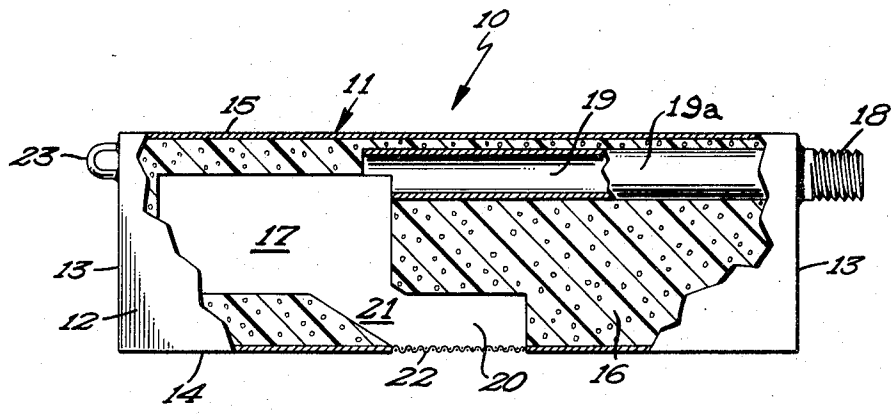
316,689	5/1885	Breese	417/61 UX
291,285	1/1884	Breese	417/61 UX

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[57] **ABSTRACT**

A floatable suction head is used with a hydraulic pump and is adapted to float in a body of water such as a settling pond. The floatable suction head is especially adapted for use with a hydraulic pump of the type used in drilling operations, and includes a housing having a bouyant body positioned interiorly thereof, the bouyant body having a ballast chamber therein. The ballast chamber communicates with the inlet and outlet of the suction head and, when filled with water, serves as a counter balance for the weight of the hose connected to the outlet of the suction head. With this arrangement, during operation of the pump, the suction head will float on the body of water in a horizontal level condition.

6 Claims, 3 Drawing Figures



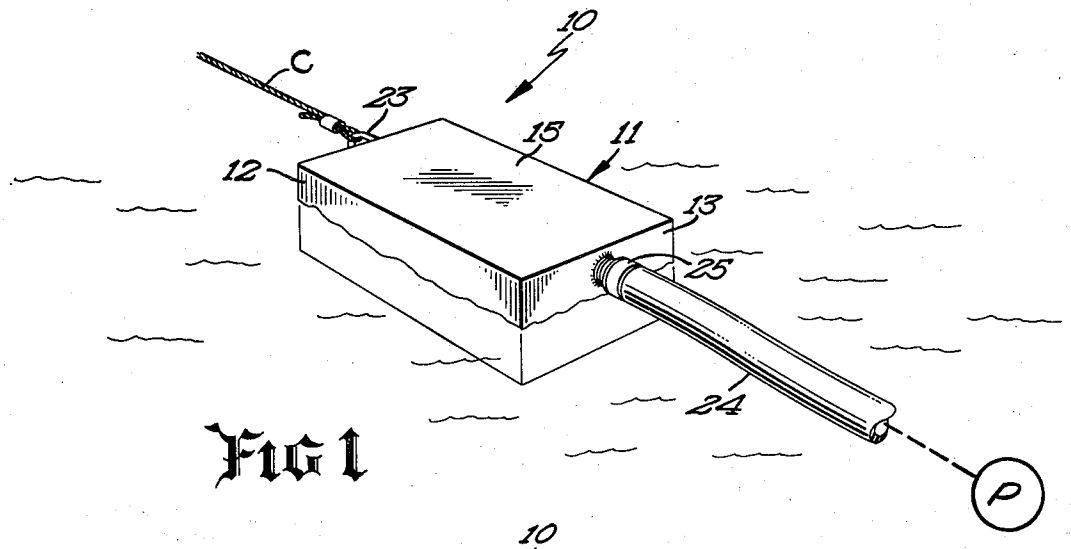


Fig 1

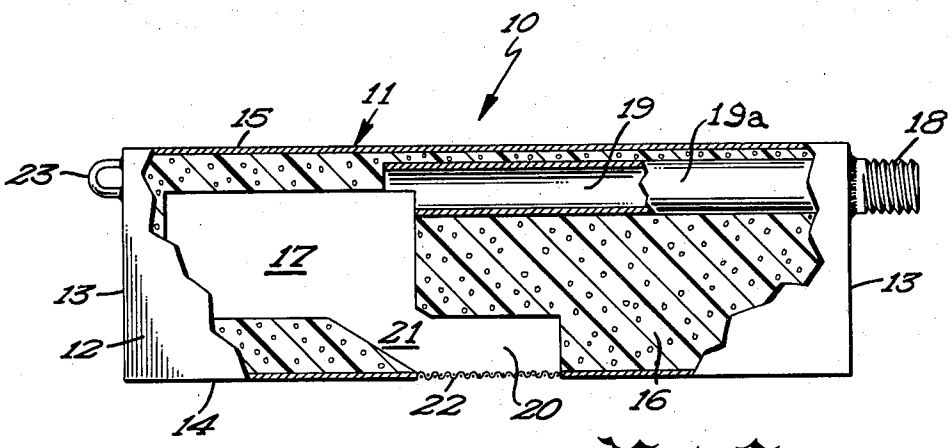


Fig 2

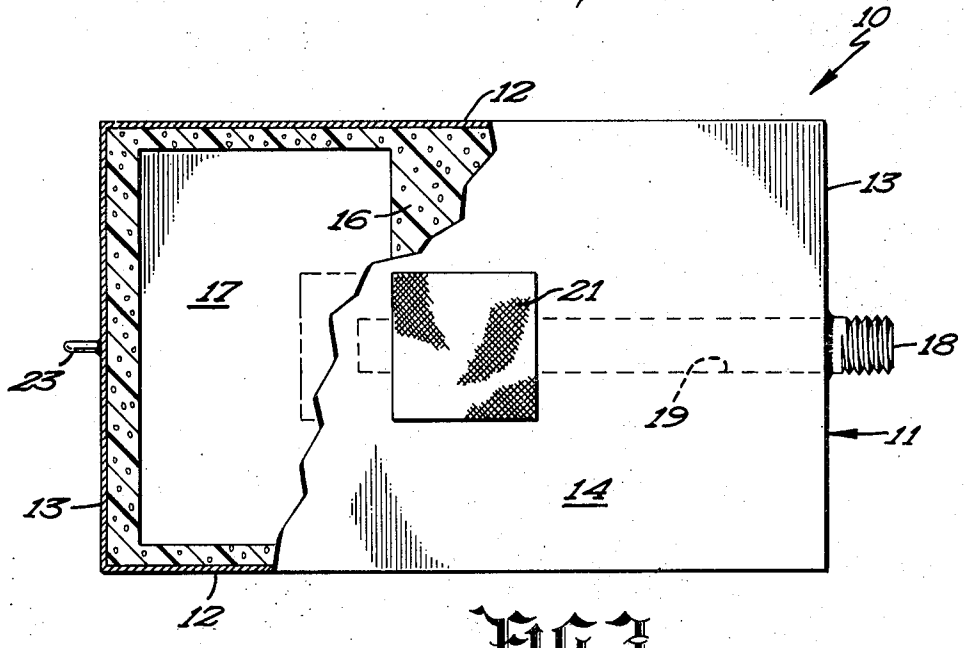


Fig 3

FLOATABLE SUCTION HEAD

SUMMARY OF THE INVENTION

A substantial and continuous supply of water is required in many types of operations such as oil drilling operations, and the source of the water supply is often a settling pond or the like. Typically, a suction pump is positioned adjacent the pond and the inlet hose is positioned in the pond. However, the inlet hose usually lies on the bottom of the pond and mud, sand and debris flow through the inlet hose and through the pump resulting in undue wear to the pump.

Attempts have been made to utilize floatable pumps and/or inlet hoses in order to avoid passage of mud, sand and the like through the pump. The prior art devices have been arranged and constructed for te purpose of inducing the flow of water adjacent the surface into the pump. However, these prior art devices are cumbersome and have been generally unsatisfactory in operation since a whirl-pooling effect is often produced which results in air being induced into the system.

It is therefore a general object of this invention to provide a floatable suction head which when connected to the inlet hose for a pump will float in a level, horizontal condition on the body of water regardless of the length or size of the hose. This is accomplished by providing the floatable suction head with a ballast chamber opposed to, and spaced from the outlet of the suction head. Since the ballast chamber communicates with the suction head inlet, water will fill the ballast chamber which then serves to counter balance the combined weight of the hose and water flowing through the hose. Thus the suction head provides a stable, horizontal level support for the inlet end of the inlet hose of the pump and permits removal of water adjacent the surface while eliminating whirl-pooling or eddying. These and other objects etc.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the novel suction head illustrated in floating relation with respect to a body of water.

FIG. 2 is a side view of the suction head with certain parts thereof broken away for clarity; and

FIG. 3 is a plan view of the suction head with parts thereof broken away for clarity.

DETAILED DESCRIPTION

Referring now to the drawings and more specifically to FIG. 1, one embodiment of the novel floatable suction head, designated generally by the reference numeral 10, is there shown. This floatable suction head 10 includes a elongate generally rectangular shaped housing 11 constructed of a suitable rigid material, preferable metal, and including opposed substantially parallel side walls 12, opposed substantially end walls 13, a bottom wall 14, and top wall 15. The suction head 10 also includes a generally rectangular shaped elongate bouyant body 16, preferably formed of a foam plastic material, which is positioned interiorly of the housing 11. It will be noted that the bouyant body substantially fills the interior of the housing but is provided with a generally rectangular shaped ballast chamber 17 which is positioned closely adjacent but spaced from one of the end walls 13. It will also be noted that the ballast chamber 17 is also spaced from the bottom wall 14 and top wall 15 as best seen in FIG. 2.

A threaded coupling element 18 is secured to one of the end walls 13 located oppositely of the end wall adjacent the ballast chamber 17. The threaded coupling element 18 actually defines an outlet for the suction head and is connected in communicating relation with a passage 19. In the embodiment shown, the passage 19 extends longitudinally through the bouyant body 16 adjacent the upper portion thereof and accommodates a pipe or conduit 19a therein. The pipe 19a communicates with the ballast chamber 17 adjacent the upper portion thereof as best seen in FIG. 2.

The bottom wall 14 and lower surface of the bouyant body have a generally rectangular shaped opening or inlet 20 therein located at substantially the center of the bottom wall. The inlet 20 is connected to a passage 21 which extends rearwardly and upwardly from the inlet and communicates with the ballast chamber 17. A screen type trash guard 22 is disposed in covering relation with respect to the inlet and prevents the entrance of debris and the like into the inlet.

The end wall 13, adjacent the ballast chamber 17 is provided with an anchor ring 23 to which is secured a cable or rope C for anchoring the suction head against movement. One end of a elongate hose 24 is provided with a hose coupling 25 which is connected to the threaded coupling element 18 on the housing 11. The hose 24, as shown, is connected to the inlet or suction side of a hydraulic pump P which in turn is of the type used in an oil drilling operation. It will be seen that when the pump P is energized, water will flow through the inlet 20, ballast chamber 17, passage 19, and outlet 18 and through the pump P.

The suction head 10 is especially adapted for use with a rotary oil drilling rig since such a drilling operation acquires a large supply of water. During a drilling operation, water is downwardly pumped through the drill stem for the purpose of washing the cuttings from adjacent the drill bit. The water entrained cuttings flow upwardly through the hole and this circulating water is ultimately returned to the settling pond. This settling pond not only serves as the primary source of water being used in the drilling operation but also permits the entrained particles to settle to the bottom.

It is, or course, desirable to introduce water into the inlet hose from adjacent the surface of the pond in order to avoid the introduction of sand, mud and debris and the like through the pumping system. It will be appreciated that when mud, sand and debris is passed through the pump, the pump will be subjected to unnecessary wear. Attempts have been made to use a bouyant support to permit the inlet end of the suction hose to float and permit suction into the inlet hose from adjacent the pond surface. However, one of the problems encountered when this is done is the production of a whirl-pool effect which ultimately results in air being sucked through the system.

The floatable suction head 10 will remove water from adjacent the top of the pond and will therefore avoid the introduction of sand, mud, trash and the like into the system. In this respect water will flow through the inlet 20 and first fill the ballast chamber 17 before it flows through the passage 19 and through the hose 24. When the ballast chamber is filled, the entire suction head is stablized in a horizontal level condition even though water is continuously flowing through the hose

14. Thus the weight of the hose and the water flowing therethrough is counter balanced by the water filled ballast chamber 17.

Since water is introduced substantially adjacent the mid portion of the suction head, and first fills a ballast chamber before being discharged through the outlet, there will be little if any disturbance of the surface of the water. Therefore since there is no whirl-pooling effect or surface disturbance, no air is introduced into the system through normal operation. In the flow pattern, it will be noted that the water flows through the inlet then upwardly and rearwardly into the large ballast chamber and finally forwardly through the ballast chamber. Thus the ballast chamber not only serves to counter balance the weight of the hose and the weight of the water flowing through the hose, but also serves as a surge chamber which serves to eliminate any whirlpool effect. Because of the relatively small vertical dimension of the suction head as compared to the width and length dimensions thereof, the suction head provides a relatively low profile and assures the removal of only water closely adjacent the surface.

Although the suction head is especially adaptable for use with oil drilling rigs, the suction head is also adaptable for use with irrigation pumps or rural fire department trucks which often use ponds as a source of water in fire fighting activities.

From the foregoing description, it will be seen that I have provided a novel suction head for use with a pump and permits the removal of water from a pond or the like adjacent the surface but without the attendant danger of producing a whirl-pooling effect so that air is introduced into the system. It will further be noted that my novel suction head because of its unique construction is maintained in a level horizontal condition during operation even though the inlet hose for the pump is connected directly to the suction head.

Thus it will be seen that I have provided a novel floatable suction head which is not only of simple and inexpensive construction but one which functions in a more efficient manner than any theretofore known comparable device.

What is claimed is:

1. A floatable suction head for use with a pump, comprising

a symmetrical housing formed of rigid material having a lower wall,

a bouyant core within said housing and substantially filling the same,

a counter balance ballast chamber in said core material adjacent one side of said housing,

a coupling member connected with said housing and being spaced from and opposed to said ballast chamber, said coupling member being connected with one end of an elongate pump-connected suction hose, an elongate passage in said core intercommunicating said coupling and said ballast chamber,

an inlet in said lower wall communicating with said ballast whereby water flowing through said inlet will fill said ballast chamber to counter balance the combined weight of the hose, and the weight of water flowing through the hose to thereby permit said suction head to float in a substantially horizontal level condition.

2. The floatable suction head as defined in claim 1 wherein said houwing and said core are each of elongate generally rectangular configuration, said housing including opposed side walls, opposed end walls, and opposed upper and lower walls.

3. The suction head as defined in claim 2 wherein said ballast chamber is of generally rectangular configuration and is positioned adjacent one of said end walls, and said coupling element is connected with the other of said end walls.

4. The suction head as defined in claim 3 wherein said passage interconnecting said coupling element and said ballast chamber is located adjacent said upper wall and communicates with said ballast chamber adjacent the upper portion thereof.

5. The suction head as defined in claim 3 wherein said inlet is spaced from said ballast chamber and is interconnected therewith by a passage which extends upwardly from said inlet and longitudinal of the housing.

6. The suction head as defined in claim 5 wherein the vertical dimension of said housing is substantially less than either the width or length dimension thereof.

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