ASSEMBLED FLOATING COVER FOR A
STORAGE TANK

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ABSTRACT

A built-up floating disc for oil reservoir concludes an inner floating disc and an outer floating disc. The inner and outer floating discs both have a radiant skeleton structure composed of boll-jointed components with I-shaped profile made from steel plate or aluminum plate. There are 6 radial beams connected with a central plate and annular beams. Peripheral beams are used to connect between the outer annular beam and the inner annular beams. Coverplate fixed beams are mounted on the radial beams, auxiliary beams are used to connect between coverplate fixing beams. Plastic floaters presenting equilateral triangle or parallelogram in shape are laid over the space within the skeleton. Thick floaters are secured on the outer annular beam and the inner annular beam. Coverplates are laid on the coverplate fixed beams and are clamped by press bars. A tongue shaped sealing rubber band and a capsule-like sealing rubber band constitute a double layer structure. Using the floating disc can prevent reserved oil from contamination and degradation. And the floating disc is lighter, it can reduce the consumption of metallic material and eliminate the phenomena of sinking disc and blocking disc.
ASSEMBLED FLOATING COVER FOR A STORAGE TANK

TECHNICAL FIELD

[0001] The invention relates to a built-up outer floating disc for oil reservoir and pertains to the technical field of equipment for oil reservation and transportation.

BACKGROUND OF ART

[0002] It is common practice to provide a floating disc in the oil reservoir, in order to prevent the oil from contamination and degradation and further to diminish evaporation loss of the oil. CN 88201602 has recommended an inner floating disc which has a radiant skeleton structure composed of bolt-jointed components with L-shaped profile made from steel plates, and within the skeleton, plastic floaters are arranged in a ring form. CN 00222242.5 has provided an antisatistical floator which is composed of a plurality of equilateral triangular components with a top angle of 30°. This construction is rather complex, difficult to fabricate and inconvenient to mount. Furthermore, there is a conventional outer floating disc which is welded from steel plates. As its seams are liable to leak, the disc is liable to sink down. On the other hand, as the vertical motion of floating disc is guided by columns, in the case in which the center of gravity is shifted, the disc is liable to block on its way, which also leads to sink down. At same time, the outer floating disc has a large weight, and it consumes more metallic material. Besides, a capsule-like sealing rubber band is used on the perimeter of outer floating disc, the band is liable to be worn owing to its large coefficient of friction, both maintenance and replacement of the band are time-consuming.

SUMMARY OF THE INVENTION

[0003] The object of the invention is to provide a built-up outer floating disc for oil reservoir such that the above disadvantages can be avoided. The outer floating disc has a skeleton composed of bolt-jointed components with L-shaped profile made from steel plates and connected by bolts. It has no the disadvantage of leak from weld, so that the accident of sinking down of the disc does not happen. Its perimeter is sealed with a double layer structure, one of tongue-shaped sealing rubber band and another of capsule-like sealing rubber band, it is not liable to be worn, so that the time for maintenance can be reduced. The floaters are laid over all the space within the skeleton, they are thin enough that the amount of oil to be reserved can be increased. In addition, the floaters are made from non-metallic material which has a lighter weight, so the consumption of metallic material can be reduced.

[0004] The invention provides such a built-up floating disc for oil reservoir. The inner floating disc has a radiant skeleton structure which is composed of bolt-jointed components with L-shaped profile made from steel plate. The plastic floaters are laid over all the space within the skeleton. The central plate of the outer floating disc is connected with radial beams and an inner annular beam. Along the inner annular beam, a number of horizontal and crosswise coverplate-fixed beams are connected. The floater-fixed beams are obliquely connected with coverplate-fixed beams and radial beams. Coverplates are laid on the coverplate-fixed beams and are clamped by press bars. The tongue-shaped sealing rubber band is mounted on the upper face of a fixing beam for sealing band, and the capsule-like sealing rubber band is mounted on the lower face of the fixing beam. These two sealing bands constitute a double-layer structure. While the cover plate is also a double-layer structure which is composed of one layer of metallic plate and another layer of glass reinforced plastic plate. Furthermore, there are steel wires to prevent the disc from rotation. The upper ends of the rotation preventing wires are mounted to the supporting frame, and the lower ends are connected to the bottom of reservoir.

[0005] The advantages of the built-up outer floating disc for oil reservoir include that the floating disc can use steel plate or aluminum plate to make into many components with L-shaped profile, which can be joined by bolts into a radiant skeleton construction with plastic floaters laid full of the space within the skeleton. It has a lightweight, the accident of sinking down of the disc can be avoided. Its rotation preventing steel wires permit the disc moving freely along the wires and thus function as a flexible guide, so that the trouble of blocking of the disc in the reservoir also can be avoided. Further the sealing rubber band is of a double-layer structure, it is not liable to be worn, thus the amount of work for maintenance also can be reduced.

DESCRIPTION OF DRAWINGS

[0006] FIG. 1 is a front view of an outer floating disc; and

[0007] FIG. 2 is a plan view of an outer floating disc.

PREFERRED EMBODIMENT OF THE INVENTION

[0008] It can be seen from FIG. 1, within the body (1) of reservoir, there mounts an outer floating disc (2). At its central position, there mounts a central water draining funnel (3) which is connected with a lower water draining pipe (4). At the bottom of outer floating disc (2), there mount several supporting legs (5), and an emergency water discharging valve (6). At the central position of the disc, there further mounts a safety venting valve (7). On the upper face of outer floating disc (2), there provides a manhole (8) for inspection and repair. On the body of the floater, there further mounts a fire-extinguishing foam protecting plate (31). And over the top of body (1) of the reservoir, a supporting frame (30) is installed.

[0009] It can be seen from FIG. 2, the components with L-shaped profile are made from steel plate and joined by bolts into a radiant skeleton structure, the floaters (9) made from oil resistant hard poly-urethane plastics are light and are laid full of the space within the skeleton.

[0010] It can be seen also from FIG. 2, the central plate (10) is connected with radial beams (11) and an inner annular beam (12). Along the inner annular beam (12), a number of horizontal and crosswise coverplate fixed beams (13) are connected. The floater fixed beams (14) are obliquely connected with coverplate fixed beams (13) and radial beams (11). Plastic floaters (9) are laid full of the space within the skeleton. Coverplates (15) are laid on the coverplate fixed beams (13) and are clamped by press bars (16). Coverplate (15) is a double layer structure which is constituted of a layer of metal and a layer of glass reinforced plastic plate.
[0011] From Fig. 1, it can be seen that, the upper ends of rotation preventing steel wires (29) are mounted to the supporting frame (30), while its lower ends are connected to the bottom of reservoir. The outer floating disc (2) can float freely up and down, while the steel wires (29) act as flexible guides, so the blocking of disc caused by guide columns can be avoided. A wax scraping plate (28) can scrape down the wax from the wall of reservoir body (1). A upper end of a conductive wire (19) is connected with the supporting frame (30). Rain shields (20) project obliquely outward from the edges of outer floating disc (12) and are placed above the thick floaters (18) around the outer floating disc. A tongue-shaped sealing rubber band (21) is mounted on the upper face of a fixing beam (22) for sealing band, while the peripheral thick floaters (18) are mounted on the lower face of this fixing beam (22). The tongue-shaped sealing rubber band (21) and a capsule-like sealing rubber band (25) are the components of a double-layer structure. A ladder balancing frame (26) is mounted at two ends of a guide rail (27) next to the wall of reservoir.

[0012] During the assembly of outer floating disc, first, an outer annular beam (23) is connected with the inner annular beam (12) at bottom of the reservoir (1) by bolt fasteners, then one end of radial beams (11) is connected to the outer annular beam (23), and the other end is connected to the central plate (10). At the same time, a number of supporting legs (5) are installed on the bottom of outer floating disc (2). Subsequently, the plastic floaters (9), coverplate fixed beams (13) and auxiliary beams (17) are mounted in order. It is possible to fill with water from the bottom of reservoir (1) and raise the outer floating disc (2) such that it can be used as a working platform for welding the wall of reservoir (1). Afterwards, the water is drained out and the impurities within the outer floating disc (2) are cleaned out, then the coverplates (15) are mounted and clamped by press bars (16). A manhole (8) is prepared for inspection and repair. The Guide rail (27) for ladder and the ladder balancing frame (26) are installed, the former is positioned at two ends of the rail next to the wall of reservoir. The tongue-shaped sealing rubber band (21) is mounted on the upper face of the fixing beam (22) while the capsule-like sealing rubber band (25) is mounted on the lower face of fixing beam (22). The upper ends of rotation preventing steel wires (29) are mounted to the supporting frame (30) while their lower ends are connected with the bottom of reservoir. The wax scraper (28) is mounted on the lower face of the outer annular thick floater (18), when the outer floating disc (2) moves downward, the scraper can scrape down the wax from the reservoir wall. The upper end of a conductive wire (19) is connected with the supporting frame (30). The safety venting valve (7) is mounted in the vicinity of central position of the outer floating disc. At that central position of the outer floating disc (2), the central water draining funnel (3) is mounted and connected with the lower water draining pipe (4).

What is claimed is:
1. A built-up floating disc for oil reservoir, characterized in that: it is a built-up floating disc which is composed of an outer floating disc (2), which is connected with a central plate (10) by 6 radial beams (11), coverplate fixed beams (13) are mounted on the radial beams (11), and many auxiliary beams (17) are used to connect between coverplate fixed beams (13), the floating disc is composed of a number of components with L-shaped profile, which are made from steel plate and joined into a radiant skeleton structure with bolts, the plastic floaters (9) presenting equilateral triangle or parallelogram in shape are laid over all the space within the skeleton, and are secured on the coverplate fixed beams (13) of the radial beams (11) and on the peripheral beams (24), while thick floaters (18) are secured on the outer annular beams (23) and the inner annular beams (12), the central plate (10) of the outer floating disc (2) is connected with radial beams (11) and the outer annular beam (23), the inner annular beam (12) is connected with coverplate fixed beams (13), the floater fixed beams (14) are connected with coverplate fixed beams (13) and radial beams (11), the floaters (9) are laid over all the space within the skeleton, the cover plates (15) are laid on the coverplate fixed beams (13) and are clamped by press bars (16), the outer floating disc (2) is provided with rotation preventing steel wires (29).

2. The built-up floating disc according to claim 1, characterized in that a tongue-shaped sealing rubber band (21) and a capsule-like sealing rubber band (25) constitute a double layer structure, the coverplates (15) are also of a double layer structure, one layer of which is metallic plate and the other layer is glass reinforced plastic plate.

3. The built-up floating is according to claim 1, characterized in that the rotation preventing steel wires (29) have its upper ends mounted to the supporting frame (30) and their lower ends connected with the bottom of reservoir.

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