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(54) **HYDRAULIC TANK**

HYDRAULIKTANK

RÉSERVOIR HYDRAULIQUE

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(73) Proprietor: **Rototec S.p.A.**

61020 Lunano (PU) (IT)

(72) Inventors:

- **BENZI, Paolo**
61020 Lunano (PU) (IT)
- **FALCONI, Mario**
61020 Lunano (PU) (IT)

(74) Representative: **Studio Torta S.p.A. et al**

Via Viotti, 9
10121 Torino (IT)

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EP 3 971 108 B1

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Description

TECHNICAL FIELD

[0001] The invention relates to a hydraulic tank.

[0002] In particular, the invention relates to an underground or outdoor hydraulic tank comprising a side wall, which has a tubular shape, extends around a longitudinal axis of the hydraulic tank and is axially closed by means of two closing elements arranged on opposite sides of the side wall.

[0003] The side wall is delimited by an outer surface and by an inner surface and has a plurality of annular slots, which are obtained in the outer surface, are distributed along the side wall and are substantially coaxial to the longitudinal axis of the hydraulic tank.

PRIOR ART

[0004] Known hydraulic tanks of the type described above, despite being largely established, suffer from some drawbacks, which are mainly due to the fact that the side wall has a relatively large thickness, a relatively low axial compressive strength as well as a relatively low resistance to bending. Documents DE202011000683U1, US2008/257894A1, US2003/136789A1 and DE19818709A1 disclose examples of tanks.

SUBJECT-MATTER OF THE INVENTION

[0005] The object of the invention is to provide a hydraulic tank that is not affected by the aforementioned drawbacks and can be manufactured in a simple and economic fashion.

[0006] According to the invention, there is provided a hydraulic tank according to claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The invention will now be described with reference to the accompanying drawings, showing a non-limiting embodiment thereof, wherein:

figure 1 is a schematic perspective view of a preferred embodiment of the hydraulic tank according to the invention;

figure 2 is a schematic perspective view of a detail of the hydraulic tank of figure 1; and

figure 3 is a schematic perspective view of a variant of the hydraulic tank of figure 1.

PREFERRED EMBODIMENT OF THE INVENTION

[0008] With reference to figures 1 and 2, number 1 indicates, as a whole, a hydraulic tank, specifically an underground hydraulic tank, for example for rainwater or wastewater.

[0009] The tank 1 has a substantially horizontal longitudinal axis 2, comprises a central element 3 with a cylindrical shape and is further provided with two closing elements 4, which are mounted on opposite sides of the element 3 and are shaped like a cup, with the concavity facing the element 3.

[0010] Each element 3, 4 has a tubular side wall 5, which extends around the axis 2, is delimited by an outer surface 6 and by an inner surface 7 (figure 2) and has a plurality of slots 8, which are obtained on the outer surface 6.

[0011] At least part of the slots 8 have a hexagonal shape and are aligned with one another according to at least one row of slots 8 parallel to the axis 2, specifically according to at least two rows of slots 8 parallel to the axis 2.

[0012] Each slot 8 is delimited by a bottom wall 9 and by six side faces 10, each inclined at an angle other than 90°, preferably ranging from 100° to 175°, relative to the wall 9.

[0013] The distance between the wall 9 of each slot 8 and the outer surface 6 of the wall 5 ranges from 0.5 mm to 100 mm.

[0014] Each slot 8 of a row of slots 8 projects between two slots 8 of the other row of slots 8.

[0015] The wall 5 further has a plurality of projections 11, which are obtained on the inner surface 7 in the area of the slots 8 and have a hexagonal shape corresponding to the hexagonal shape of the slots 8.

[0016] Each element 4 has at least one access opening 12, which allows access to the tank 1 and is obtained through the relative wall 5.

[0017] The tank 1 has some advantages, which are mainly due to the fact that the side wall 5 has a relatively small thickness, a relatively high axial compressive strength as well as a relatively high resistance to bending.

[0018] The variant shown in figure 3 relates to a hydraulic tank 13, specifically an outdoor hydraulic tank.

[0019] The tank 13 has a substantially vertical longitudinal axis 14, is delimited by a bottom wall 15 and by an upper wall 16, which are substantially flat and perpendicular to the axis 14, and is further delimited by a substantially cylindrical side wall 17, which is coaxial to the axis 14.

[0020] The wall 17 is delimited by an outer surface 18 and by an inner surface (not shown) and has a plurality of slots 19, which are obtained on the outer surface 18.

[0021] At least part of the slots 19 have a hexagonal shape and are aligned with one another according to a plurality of rows of slots 19 parallel to the axis 14.

[0022] Each slot 19 is delimited by a bottom wall 20 and by six side faces 21, each inclined at an angle other than 90°, preferably ranging from 100° to 175°, relative to the wall 20.

[0023] The distance between the wall 20 of each slot 19 and the outer surface 18 of the wall 17 ranges from 0.5 mm to 100 mm.

[0024] The wall 17 further has a plurality of projections

(not shown), which are obtained on the inner surface (not shown) of the wall 17 in the area of the slots 19 and have a hexagonal shape corresponding to the hexagonal shape of the slots 19.

[0025] The wall 16 has an access opening 22 allowing access to the tank 13.

Claims

1. A hydraulic tank having a longitudinal axis (2; 14) and comprising a tubular side wall (5; 17), which extends around the longitudinal axis (2; 14), is delimited by an outer surface (6; 18) and by an inner surface (7) and has a plurality of slots (8; 19) obtained on the outer surface (6; 18); and **characterized in that** at least part of the slots (8; 19) are hexagonal slots (8; 19) aligned with one another along at least one row of hexagonal slots (8; 19) parallel to the longitudinal axis (2; 14).
2. A hydraulic tank according to claim 1, wherein each hexagonal slot (8; 19) is delimited by a bottom wall (9; 20) and by six side faces (10; 21); each side face (10; 21) of at least part of the side faces (10; 21) being inclined at an angle other than 90° relative to the bottom wall (9; 20).
3. A hydraulic tank according to claim 2, wherein the angle formed between the bottom wall (9; 20) and each side face (10; 21) ranges from 100° to 175°.
4. A hydraulic tank according to claim 2 or 3, wherein the distance between the bottom wall (9; 20) of each hexagonal slot (8; 19) and the outer surface (6; 18) of the side wall (5; 17) ranges from 0.5 mm to 100 mm.
5. A hydraulic tank according to any one of the preceding claims, wherein the hexagonal slots (8; 19) are aligned with one another along at least two rows of hexagonal slots (8; 19), which are uniformly distributed around the longitudinal axis (2; 14) and are parallel to one another and to the longitudinal axis (2; 14).
6. A hydraulic tank according to claim 5, wherein each hexagonal slot (8; 19) of a row of hexagonal slots (8; 19) projects between two hexagonal slots (8; 19) of the other row of hexagonal slots (8; 19).
7. A hydraulic tank according to any one of the preceding claims, wherein the side wall (5; 17) further has a plurality of projections (11) obtained on the inner surface (7).
8. A hydraulic tank according to claim 7, wherein each projection (11) of at least part of the projections (11)

is a hexagonal projection (11) corresponding to a relative hexagonal slot (8; 19).

9. A hydraulic tank according to any one of the preceding claims and further comprising two closing elements (4; 16, 17) arranged on opposite sides of the side wall (5; 17) so as to axially close the side wall (5; 17).

10. A hydraulic tank according to claim 9 and further comprising at least one access opening (12; 22), which is obtained through the side wall (5; 17) and/or the closing elements (4; 16, 17).

Patentansprüche

1. Hydrauliktank mit einer Längsachse (2; 14) und aufweisend eine röhrenförmige Seitenwand (5; 17), welche sich um die Längsachse (2; 14) herum erstreckt, durch eine äußere Oberfläche (6; 18) und eine innere Oberfläche (7) begrenzt wird, und eine Vielzahl von auf der äußeren Oberfläche (6; 18) bestehenden Aussparungen (8; 19) aufweist; und **dadurch gekennzeichnet ist, dass** zumindest ein Teil der Aussparungen (8; 19) als hexagonale Aussparungen (8; 19), welche zueinander entlang zumindest einer parallel zu der Längsachse (2; 14) verlaufenden Reihe von hexagonalen Aussparungen (8; 19) ausgerichtet sind, ausgebildet sind.
2. Hydrauliktank nach Anspruch 1, wobei jede hexagonale Aussparung (8; 19) durch eine Bodenwand (9; 20) und sechs Seitenflächen (10; 21) begrenzt wird; wobei jede Seitenfläche (10; 21) von zumindest einem Teil der Seitenflächen (10; 21) in einem von 90° verschiedenen Winkel gegenüber der Bodenwand (9; 20) geneigt ist.
3. Hydrauliktank nach Anspruch 2, wobei der zwischen der Bodenwand (9; 20) und jeder Seitenfläche (10; 21) gebildete Winkel zwischen 100° und 175° liegt.
4. Hydrauliktank nach Anspruch 2 oder 3, wobei der Abstand zwischen der Bodenwand (9; 20) jeder hexagonalen Aussparung (8; 19) und der äußeren Oberfläche (6; 18) der Seitenwand (5; 17) zwischen 0,5mm und 100mm liegt.
5. Hydrauliktank nach einem der vorhergehenden Ansprüche, wobei die hexagonalen Aussparungen (8; 19) zueinander entlang zumindest zweier Reihen von hexagonalen Aussparungen (8; 19), welche gleichmäßig um die Längsachse (2; 14) herum verteilt sind und zueinander und zu der Längsachse (2; 14) parallel verlaufen, ausgerichtet sind.
6. Hydrauliktank nach Anspruch 6, wobei jede hexago-

nal Aussparung (8; 19) einer Reihe von hexagonalen Aussparungen (8; 19) zwischen zwei hexagonale Aussparungen (8; 19) der anderen Reihe von hexagonalen Aussparungen (8; 19) hineinragt.

7. Hydrauliktank nach einem der vorhergehenden Ansprüche, wobei die Seitenwand (5; 17) weiterhin eine Vielzahl von auf der inneren Oberfläche (7) bestehenden Vorsprüngen (11) aufweist.
8. Hydrauliktank nach Anspruch 7, wobei jeder Vorsprung (11) von zumindest einem Teil der Vorsprünge (11) als ein einer hexagonalen Aussparung (8; 19) entsprechender hexagonaler Vorsprung (11) ausgebildet ist.
9. Hydrauliktank nach einem der vorhergehenden Ansprüche, weiterhin aufweisend zwei Abschlusselemente (4; 16, 17), welche an gegenüberliegenden Seiten der Seitenwand (5; 17) angeordnet sind um die Seitenwand (5; 17) axial abzuschließen.
10. Hydrauliktank nach Anspruch 9, weiterhin aufweisend mindesten eine Zugangsöffnung (12; 22), welche durch die Seitenwand (5; 17) und/oder die Abschlusselemente (4; 16, 17) hindurch besteht.

Revendications

1. Réservoir hydraulique ayant un axe longitudinal (2 ; 14) et comprenant une paroi latérale tubulaire (5 ; 17), qui s'étend autour de l'axe longitudinal (2 ; 14), est délimitée par une surface extérieure (6 ; 18) et par une surface intérieure (7) et a une pluralité de fentes (8 ; 19) obtenues sur la surface extérieure (6 ; 18) ; et **caractérisé en ce qu'**au moins une partie des fentes (8 ; 19) sont des fentes hexagonales (8 ; 19) alignées les unes sur les autres le long d'au moins une rangée de fentes hexagonales (8 ; 19) parallèles à l'axe longitudinal (2 ; 14).
2. Réservoir hydraulique selon la revendication 1, dans lequel chaque fente hexagonale (8 ; 19) est délimitée par une paroi de fond (9 ; 20) et par six faces latérales (10 ; 21) ; chaque face latérale (10 ; 21) d'au moins une partie des faces latérales (10 ; 21) étant inclinée à un angle autre que 90° par rapport à la paroi de fond (9 ; 20).
3. Réservoir hydraulique selon la revendication 2, dans lequel l'angle formé entre la paroi de fond (9 ; 20) et chaque face latérale (10 ; 21) est compris entre 100° et 175°.
4. Réservoir hydraulique selon la revendication 2 ou 3, dans lequel la distance entre la paroi de fond (9 ; 20) de chaque fente hexagonale (8 ; 19) et la surface

extérieure (6 ; 18) de la paroi latérale (5 ; 17) est comprise entre 0,5 nm et 100 nm.

5. Réservoir hydraulique selon l'une quelconque des revendications précédentes, dans lequel les fentes hexagonales (8 ; 19) sont alignées les unes avec les autres le long d'au moins deux rangées de fentes hexagonales (8 ; 19), qui sont uniformément réparties autour de l'axe longitudinal (2 ; 14) et sont parallèles les unes aux autres et à l'axe longitudinal (2 ; 14).
6. Réservoir hydraulique selon la revendication 5, dans lequel chaque fente hexagonale (8 ; 19) d'une rangée de fentes hexagonales (8 ; 19) fait saillie entre deux fentes hexagonales (8 ; 19) de l'autre rangée de fentes hexagonales (8 ; 19).
7. Réservoir hydraulique selon l'une quelconque des revendications précédentes, dans lequel la paroi latérale (5 ; 17) a en outre une pluralité de saillies (11) obtenues sur la surface intérieure (7).
8. Réservoir hydraulique selon la revendication 7, dans lequel chaque saillie (11) d'au moins une partie des saillies (11) est une saillie hexagonale (11) correspondant à une fente hexagonale relative (8 ; 19).
9. Réservoir hydraulique selon l'une quelconque des revendications précédentes et comprenant en outre deux éléments de fermeture (4 ; 16, 17) disposés sur les côtés opposés de la paroi latérale (5 ; 17) de manière à fermer axialement la paroi latérale (5 ; 17).
10. Réservoir hydraulique selon la revendication 9 et comprenant en outre au moins une ouverture d'accès (12 ; 22), qui est obtenue à travers la paroi latérale (5 ; 17) et/ou les éléments de fermeture (4 ; 16, 17).

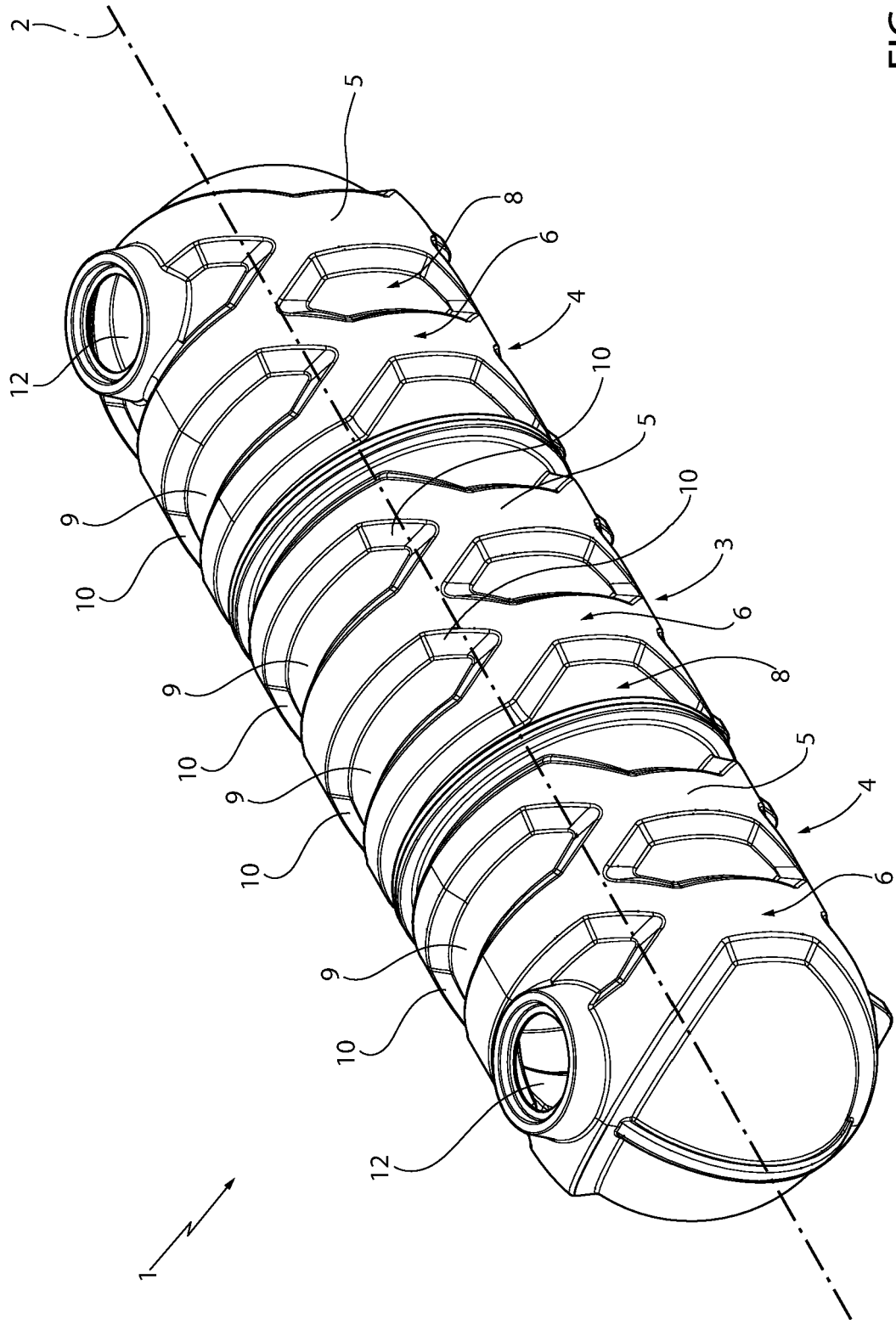


FIG. 1

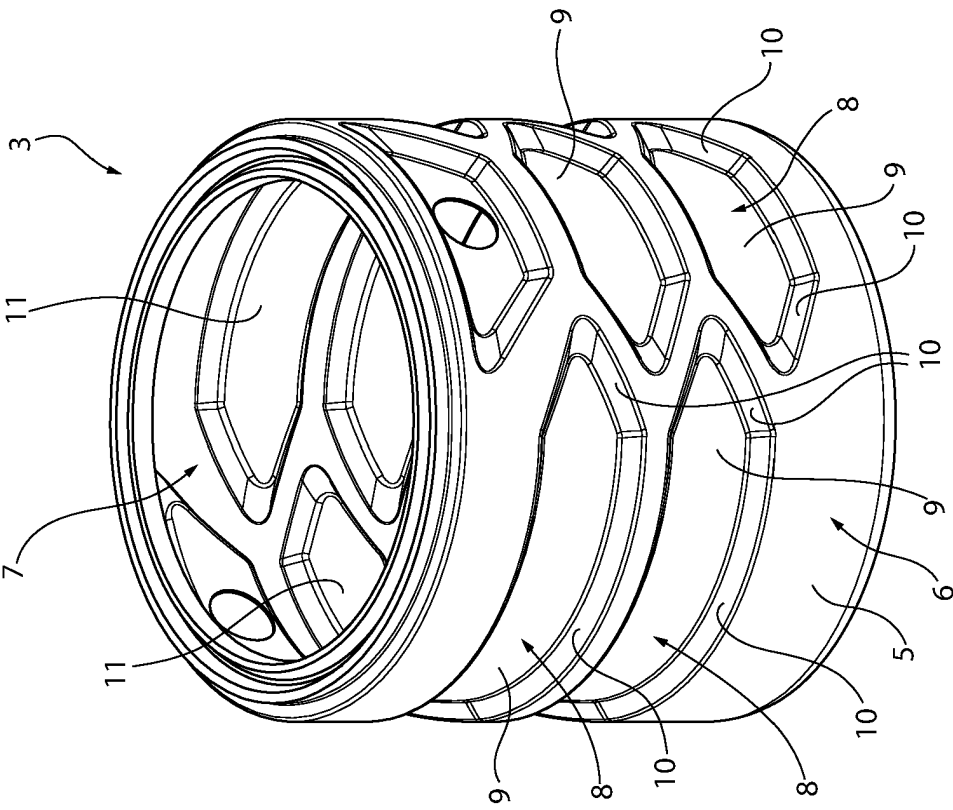


FIG. 2

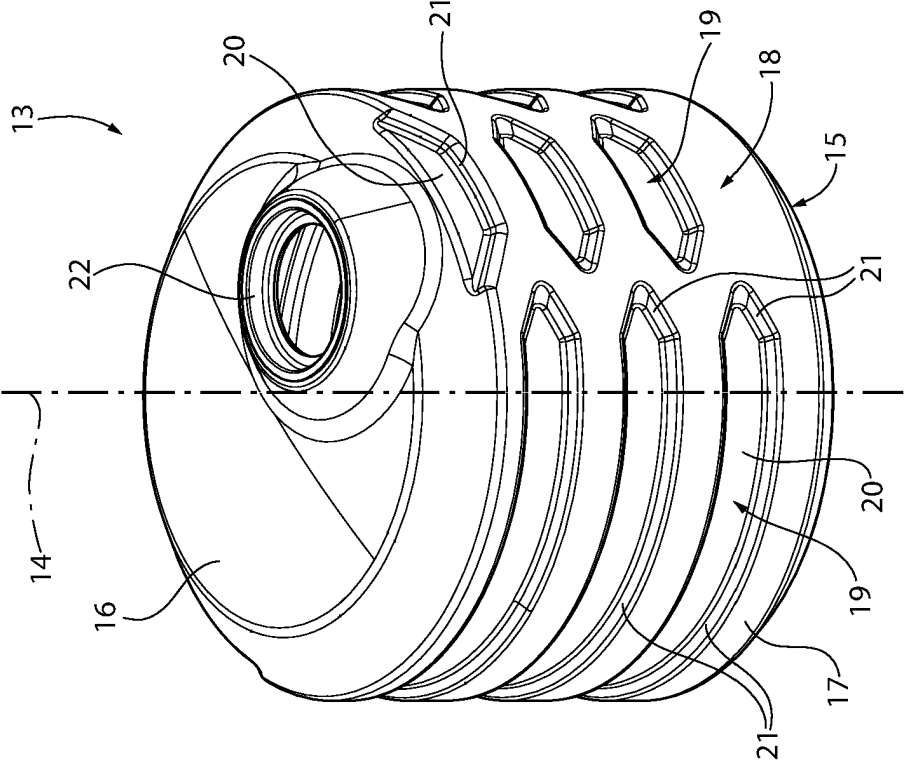


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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