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Motoros szivattyúegység

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmat az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

Pump Unit

[0001] The present invention relates to pump units and, more specifically, to those that make it possible to suck up floating matter, in particular for the pumping of black water or sewage. Black water or sewage are names given to waste water comprising lavatory water waste.

[0002] A pump unit of this type having a vertical axis is already known. It has below an aspiration bottom. The internal wall of the aspiration bottom delimits an aspiration gill. The external wall of the aspiration bottom delimits a supply zone. A first portion of the lower free edge of the external wall is at a lower level than the lower free edge of the internal wall. In order to facilitate the pumping of floating matter, froth and other fats that remain on the surface of a suspension to be pumped, it is already known to incline a pump unit of this type. In order to incline it a base foot with an adjusting claw is provided. The claw of a base foot of this type is heavier than a normal claw, and in particular it is more difficult to produce. One may also provide the incline so that the base foot has an inclined bearing face, but then one loses the possibility of mounting the pump unit vertically, with the advantages of symmetry of aspiration and aspiration lower in the sump.

[0003] In EP-A-1 739 311 a vortex prevention device is described that is placed in a sump and which is combined with a pump.

[0004] The invention relates to a pump unit of the type mentioned above and in which one keeps, for the greatest part of the pump function, the symmetry of aspiration, while having the lowest possible level of aspiration in the sump, but without, however, needing a complicated and expensive arrangement.

[0005] According to the invention the lower edge of a second portion of the external wall is at a level which is higher than the lower edge of the internal wall.

[0006] There is thus no longer any need to incline the pump unit. When the liquid level in the sump falls just below the level of the lower free edge of the external wall, the liquid, but especially the floating matter, is sucked up by the portion of the aspiration gill delimited by the second portion of the external wall, whereas the rest of the aspiration gill continues to suck up the liquid normally. One continues to pump the liquid, and this contributes to carrying the floating matter along in the pump. After the sump has been emptied and it starts to refill, the arrangement according to the invention makes it possible to flush out the supply zone and to not trap air in the aspiration gill. Thus, it is easy to restart the pump.

[0007] Preferably, the second portion of the external wall is inclined in respect of the axis. This makes it possible to obtain a more progressive speed gradient for the pumping of the floating matter. The angle of inclination is preferably comprised between 30° and 60° .

[0008] Preferably, the second portion has a peripheral length representing 10 to 40% of the sum of the peripheral lengths of the first portion and of the second portion of the lower free edge. In particular, it is preferable for this percentage to be approximately 25 to 30%.

[0009] Furthermore, it is preferable for the second portion to be on the side of the unit which is opposite to the side where the pressure pipeline of the pump unit is. Pumping of the floating matter is thus facilitated because it is not obstructed by the pressure pipeline or the base foot, if there is one.



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[0010] In fact, it is also an advantage of the present invention that it is made possible to eliminate floating matter without the pump being on a base foot. One can achieve this elimination even if the pump is provided with mounting means on a tripod.

[0011] EP 1 739 311 describes devices located in the pit which serve to guide the liquid to be pumped in order to prevent the creation of vortices on the surface of the body of water. These devices do not form part of the pump unit as such. One seeks to reduce the speed of the water, whereas according to the present invention it is increased by the relatively small second portion in order to better carry along the floating matter. The pump unit according to the invention is of a type as is described in this prior document, which has no base foot and no supply zone delimited by walls parallel to the axis of the unit.

[0012] In the attached drawings, given purely by way of example:

Figure 1 is a sectional view of a pump unit according to the invention, whereas

Figure 2 is a partial plan view from below.

[0013] The pump unit shown in Figure 1 comprises a shaft 1 that defines the vertical axis of the unit, the shaft 1 forms the rotor of an electric motor, the stator of which is identified by 2. An impeller 3 is wedged on the bottom portion of the shaft 1. An aspiration bottom 5 is fixed by screws 4 beneath the impeller. The bottom 5 has a vertical annular external wall 6 and a vertical annular internal wall 7. The internal wall is closer to the shaft 1 in the horizontal direction, the wall 6 being further away. The wall 7 delimits an aspiration gill. The external wall 6 delimits an aspiration zone 10. A first portion 11 of the lower free edge 12 of the external wall 6 is at a lower level than the lower free edge 13 of the internal wall 7. However, the lower free edge 14 of a second portion 15 of the external wall 6 is at a level higher than the lower edge 13 of the internal wall 7. The second portion 15 is inclined by an angle of 30° to 60° and its angle at the centre is 120°. This small angle means that the water which carries along the floating matter which is sucked up moves at high speed.

[0014] The liquid sucked up by the aspiration gill is discharged by a pressure pipeline 16. The unit is supported on a tripod 17.

[0015] The second portion 15 is located on the side of the unit which is opposite to the side where the pressure pipeline 16 is.

[0016] The unit is mounted by positioning its axis vertically. A unit according to the invention is able to effectively pump the floating matter without it being necessary to incline it.

Motoros szivattyúegység

Szabadalmi igénypontok

1. Függőleges tengelyű (1) motoros szivattyúegység, amely egy eszközzel van ellátva egy talpazatra vagy egy háromlábú állványra (17) történő felszereléshez, és amely alul egy szívófenékkal (5) rendelkezik, amelynek gyűrű alakú függőleges belső fala (7) egy szívónyílást (9) határol és amely szívófenék (5) gyűrű alakú függőleges külső falának (6) szélé egy beömlési tartományt (10) határol, ahol a külső fal (6) szabad alsó szélének (12) első része (11) alacsonyabb szinten helyezkedik el, mint a belső fal (7) szabad alsó szélé (13), *azzal*



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jellemezve, hogy a külső fal (6) második részének (15) szabad alsó széle magasabb szinten helyezkedik el, mint a belső fal (7) alsó széle (13).

2. Az 1. igénypont szerinti szivattyúegység, *azzal jellemezve*, hogy a külső fal második része meg van döntve a tengelyhez (1) képest.

3. A 2. igénypont szerinti szivattyúegység, *azzal jellemezve*, hogy a dőlésszög 30° és 60° közé esik.

4. Az 1, 2. vagy 3. igénypont szerinti szivattyúegység, amely egy nyomócsőcsonkkal (16) rendelkezik, *azzal jellemezve*, hogy a második rész (15) a szivattyúegység átellenes oldalán helyezkedik el ahhoz az oldalhoz képest, ahol a nyomócsőcsonk (16) található.

5. Az előző igénypontok bármelyike szerinti szivattyúegység, *azzal jellemezve*, hogy a második rész olyan kerületi hosszal rendelkezik, amely az első rész és a második rész kerületi hosszai összegének 10-40 %-át teszi ki.

6. Eljárás lebegő anyagok beszívására egy árokban, *azzal jellemezve*, hogy az eljárás abból áll, hogy egy az előző igénypontok bármelyike szerinti motoros szivattyúegységet helyezünk az árokba, és azt ott üzemeltetjük.

