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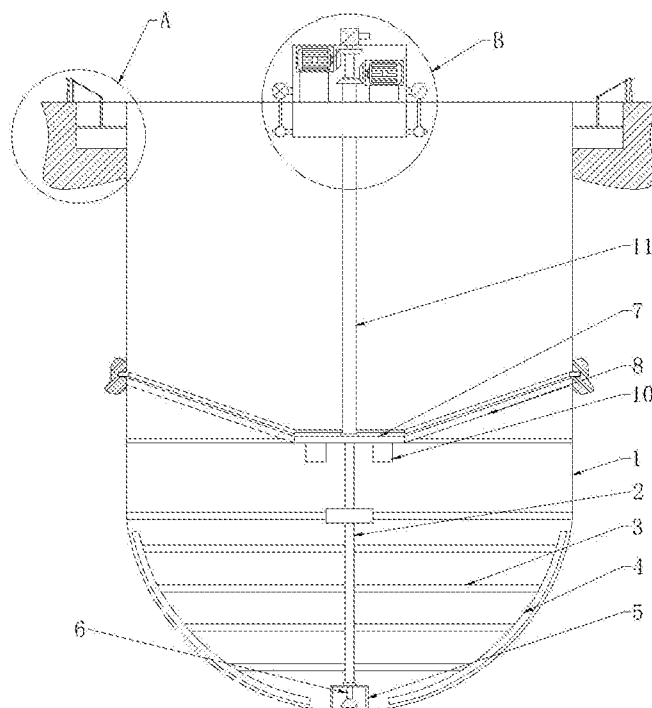
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(54)

A New Sludge Cleaning Device for Sewage Treatment Tank.

(57)

The invention discloses a new sludge cleaning device for sewage treatment tank, comprising a tank body, the bottom of the tank body is provided with a support frame, the upper side of the support frame is rotatably connected with a rotating tube, the lower part of the rotating tube is symmetrically provided with stirring rods, the outer end of the stirring rod is fixed with an arc-shaped scraper, the upper end of the rotating tube is provided with a first driven bevel gear, the left side of the first driven bevel gear is meshed with a first driving bevel gear, the left side of the first driving bevel gear is meshed with a first motor, the upper end of the sleeve is fixed with a second driven bevel gear, the right side of the second driven bevel gear is meshed with a second driving bevel gear, the right side of the second driving bevel gear is connected with a second motor, the inner side of the rotating tube is penetrated and rotatably connected with a sewage tube, the lower end of the sewage tube is provided at the bottom of the tank body, and the upper end of the sewage tube is provided with a sewage pump; the invention can not only clean the scum, but also the sludge, has the advantages of high cleaning efficiency, safe and practical, convenient and quick operation, and can realize the automatic cleaning of the sewage tank.

**Figure 1**

A New Sludge Cleaning Device for Sewage Treatment Tank

Technical Field

The invention belongs to the technical field of sewage treatment equipment, in particular
5 to a new sludge cleaning device for sewage treatment tank.

Background Technology

Sewage treatment equipment is an industrial equipment that can effectively treat
domestic sewage and industrial wastewater in urban areas. It is of great significance to
10 improve the ecological environment, improve the city grade and promote the economic
development by avoiding the direct inflow of sewage and pollutants into the water area. There
are often floating sludge and floating objects on the tank surface of the sewage treatment tank,
as well as the sludge sedimentation in the sewage treatment tank, which has a certain impact
on the daily management of the sewage treatment enterprises. In general, we usually
15 concentrate the floating objects on the surface of a single pool by scraper, and then use the
filter screen for centralized salvaging. This method requires labor salvaging and is close to the
sewage treatment tank. It is easy to cause the operators to fall into the water tank, thus
bringing potential safety hazards. Meanwhile, the sewage treatment tank will accumulate a
large amount of sludge after long-term use. Currently, in the process of sludge cleaning, we
20 need to drain the water inside the sewage treatment tank first, and then clean the sludge in the
tank by hand digging, which is time-consuming and labor-consuming.

Summary of the Invention

25 The purpose of the invention is to provide a new sludge cleaning device for sewage
treatment tank, which can not only clean the scum, but also the sludge, has the advantages of
high cleaning efficiency, safe and practical, convenient and quick operation, and can realize
the automatic cleaning of the sewage tank.

In order to realize the above purpose, the invention provides the following technical
30 solutions: A new sludge cleaning device for sewage treatment tank, comprising a tank body,
the lower part of the tank body is provided with a hemispherical structure, the bottom of the
tank body is provided with a support frame, the upper side of the support frame is rotatably

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connected with a rotating tube, the lower part of the rotating tube is symmetrically provided with stirring rods, the outer end of the stirring rod is fixed with an arc-shaped scraper, the middle part of the rotating tube is penetrated with a circular plate, the lower side of the circular plate is installed with a number of electric water valves, the upper side of the circular plate is fixed with a diversion bucket, the upper side of the circular plate is rotatably connected with a sleeve, the sleeve is sleeved on the outside of the rotating tube and is rotatably connected with the rotating tube, the lower end of the sleeve is symmetrically provided with connecting rods, the outer end of the connecting rod is provided with a strip scraper, the outer end of the strip scraper is provided with a sliding head, the middle part of the tank body is provided with a chute, the sliding head slides on the inner side of the chute, the upper end of the rotating tube is provided with a first driven bevel gear, the left side of the first driven bevel gear is meshed with a first driving bevel gear, the left side of the first driving bevel gear is meshed with a first motor, the upper end of the sleeve is fixed with a second driven bevel gear, the right side of the second driven bevel gear is meshed with a second driving bevel gear, the right side of the second driving bevel gear is connected with a second motor, the upper side of the tank body is provided with a walking bridge, the lower side of the walking bridge is symmetrically provided with water tubes, the upper middle part of the water tube is connected with a water supply hose, the upper end of the water supply hose is installed with a water pump, the side of the water tube away from the walking bridge is provided with a number of water outlets, the tank body is symmetrically provided with collecting tanks, the middle part of the collecting tank is provided with a filter plate, the upper side of the filter plate is provided with a lifting assembly, the inner side of the rotating tube is penetrated and rotatably connected with a sewage tube, the lower end of the sewage tube is provided at the bottom of the tank body, and the upper end of the sewage tube is provided with a sewage pump.

Further, the lifting assembly comprises a lifting rod, the upper end of the lifting rod is hinged with a connecting rod, the lower side of one end of the connecting rod away from the lifting rod is fixed with an electric telescopic rod, the left side of the electric telescopic rod is provided with a hinge rod, the upper end of the hinge rod is hinged with the connecting rod, and the lifting rod is fixedly connected with the filter plate.

Further, the number of the electric water valves is 3-5.

Further, the support frame comprises a support plate, the lower side of the support plate is symmetrically fixed with support rods, and the lower end of the support rod is fixed at the

bottom of the tank body.

Further, the lower side of the diversion bucket is evenly provided with a number of horizontal struts, and the outer end of the horizontal struts is fixedly connected with the side wall of the tank body.

5 Further, the upper side of the middle part of the walking bridge is provided with a shell, the first motor, the second motor, the first driving bevel gear, the first driven bevel gear, the second driving bevel gear and the second driven bevel gear are provided on the inner side of the shell, and the lower side of the first motor and the second motor are provided with a base.

10 Further, the lower part of the rotating tube is provided with a firm plate, the rotating tube is penetrated and rotatably connected with the firm plate, the firm plate is symmetrically connected with fixing rods, and the outer end of the fixing rod is fixed on the side wall of the tank body.

The beneficial effects of the invention are as follows:

15 The invention can realize the separation of the upper part and the lower part of the sewage tank by setting the diversion bucket, the circular plate and the electric water valve, so as to avoid the need to drain the water in the sewage tank when cleaning the sewage tank, increase the energy consumption of pumping, it is time-consuming and labor-consuming, and increase the cleaning cost of the sludge. When the electric water valve is closed, the first motor is started. The first motor drives the rotation of the rotating tube through the first
20 driving bevel gear and the first driven bevel gear, the rotating tube drives the stirring rod and the arc-shaped scraper to rotate, mix the sedimental sludge and water into a slurry, and then discharge it through the sewage pump, so as to avoid the phenomenon that the sedimentation and hardening at the bottom of the sludge can not be discharged, and greatly improve the effect and efficiency of sludge cleaning. The sleeve is sleeved on the outside of the rotating
25 tube, and then the rotating tube is sleeved on the inside of the sewage tube. This structure is designed ingeniously and saves space. The sleeve can drive the strip scraper to rotate, which facilitates the sludge sedimentation into the bottom of the sewage tank for sedimentation. Meanwhile, the floating objects on the upper side of the sewage tank can be discharged into the collecting tank through the drainage port by setting water tubes, so as to realize the
30 collection of floating objects, and then the filter plate is driven by the lifting assembly to salvage the floating objects, which is fast, efficient and safe.

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Brief Description of Drawings

Figure 1 is a schematic diagram of the top view structure of the invention.

Figure 2 is a schematic diagram of the structure of the diversion bucket and the strip scraper of the invention.

5 Figure 3 is a schematic diagram of the top view structure of the tank body of the invention.

Figure 4 is an enlarged view of part A of the invention.

Figure 5 is an enlarged view of part B of the invention.

Support frame, 6. Sewage tube, 7. Circular plate, 8. Diversion bucket, 9. Wheel axle, 91.
10 Lifting rod, 92. Movable rod, 93. Electric telescopic rod, 94. Hinge rod, 10. Electric water
valve, 11. Sleeve, 12. Connecting rod, 13. Strip scraper, 14. Sliding head, 15. Chute, 16. First
driven bevel gear, 17. First driving bevel gear, 18. First motor, 19. Second driven bevel gear,
20. Second driving bevel gear, 21. Second motor, 22. Water tube, 23. Water supply hose, 24.
Water pump, 25. Water outlet, 26. Sewage tube, 27. Sewage pump, 28. Collecting tank, 29.
15 Filter plate, 30. Walking bridge.

Detailed Description of the Presently Preferred Embodiments

The technical solutions in the embodiments of the invention will be described clearly and completely below in conjunction with the drawings in the embodiments of the invention.

20 Obviously, the described embodiments are only a part of the embodiments of the invention, not all of the embodiments. In view of the embodiments of the invention, all other embodiments obtained by those ordinary technical personnel in the field without paying any creative work shall belong to the protection scope of the invention.

In the embodiments, referring to Figures 1-5, the embodiment provides a sludge cleaning
25 device for sewage treatment tank, comprising a tank body 1, the lower part of the tank body 1 is provided with a hemispherical structure, the bottom of the tank body 1 is provided with a support frame 5, the upper side of the support frame 5 is rotatably connected with a rotating tube 2, the lower part of the rotating tube 2 is symmetrically provided with stirring rods 3, the outer end of the stirring rod 3 is fixed with an arc-shaped scraper 4, the middle part of the
30 rotating tube 2 is penetrated with a circular plate 7, the lower side of the circular plate 7 is installed with a number of electric water valves 10, the upper side of the circular plate 7 is fixed with a diversion bucket 8, the upper side of the circular plate 7 is rotatably connected

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with a sleeve 11, the sleeve 11 is sleeved on the outside of the rotating tube 2 and is rotatably connected with the rotating tube 2, the lower end of the sleeve 11 is symmetrically provided with connecting rods 12, the outer end of the connecting rod 12 is provided with a strip scraper 13, the outer end of the strip scraper 13 is provided with a sliding head 14, the middle part of the tank body 1 is provided with a chute 15, the sliding head 14 slides on the inner side of the chute 15, the upper end of the rotating tube 2 is provided with a first driven bevel gear 16, the left side of the first driven bevel gear 16 is meshed with a first driving bevel gear 17, the left side of the first driving bevel gear 17 is meshed with a first motor 18, the upper end of the sleeve 11 is fixed with a second driven bevel gear 19, the right side of the second driven bevel gear 19 is meshed with a second driving bevel gear 20, the right side of the second driving bevel gear 20 is connected with a second motor 21, the upper side of the tank body 1 is provided with a walking bridge 30, the lower side of the walking bridge 30 is symmetrically provided with water tubes 22, the upper middle part of the water tube 22 is connected with a water supply hose 23, the upper end of the water supply hose 23 is installed with a water pump 24, the side of the water tube 22 away from the walking bridge 30 is provided with a number of water outlets 25, the tank body 1 is symmetrically provided with collecting tanks 28, the middle part of the collecting tank 28 is provided with a filter plate 29, the upper side of the filter plate 29 is provided with a lifting assembly 9, the inner side of the rotating tube 2 is penetrated and rotatably connected with a sewage tube 26, the lower end of the sewage tube 26 is provided at the bottom of the tank body 1, and the upper end of the sewage tube 26 is provided with a sewage pump 27.

In order to realize the automatic lifting of the filter plate driven by the lifting assembly 9, so as to realize the automatic collection and salvage of floating objects on the upper side of the sewage tank, which is fast and efficient, and reduces the labor amount of workers, in the embodiment, further, the lifting assembly 9 comprises a lifting rod 91, the upper end of the lifting rod 91 is hinged with a movable rod 92, the lower side of one end of the movable rod 92 away from the lifting rod 91 is fixed with an electric telescopic rod 93, the left side of the electric telescopic rod 93 is provided with a hinge rod 94, the upper end of the hinge rod 94 is hinged with the movable rod 92, and the lifting rod 91 is fixedly connected with the filter plate 29.

In order to facilitate the cleaning of the sludge at the bottom of the tank, by closing the electric water valve 10, the sewage at the bottom of the tank body 1 can be separated from the

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water at the upper part, so that the sludge can be cleaned without draining the water inside the tank body 2, which reduces the labor amount of sludge cleaning, is time-saving and labor-saving, and has a good effect on sludge cleaning, in the embodiment, further, the number of the electric water valves 10 is 3-5.

5 In order to play the role of rotating support for rotating tube 2 through the support frame 5, in the embodiment, further, the support frame 5 comprises a support plate, the lower side of the support plate is symmetrically fixed with support rods, and the lower end of the support rod is fixed at the bottom of the tank body 1.

10 In order to support and fix the diversion bucket 8, in the embodiment, further, the lower side of the diversion bucket 8 is evenly provided with a number of horizontal struts, and the outer end of the horizontal struts is fixedly connected with the side wall of the tank body 1.

15 In order to play the role of protecting the first motor 18, the second motor 21, the first driving bevel gear 17, the first driven bevel gear 16, the second driving bevel gear 20 and the second driven bevel gear 19 through the shell, in the embodiment, further, the upper side of the middle part of the walking bridge 30 is provided with a shell, the first motor 18, the second motor 21, the first driving bevel gear 17, the first driven bevel gear 16, the second driving bevel gear 20 and the second driven bevel gear 19 are provided on the inner side of the shell, and the lower side of the first motor 18 and the second motor 21 are provided with a base.

20 In order to play the role of supporting the rotating tube 2 firmly, in the embodiment, further, the lower part of the rotating tube 2 is provided with a firm plate, the rotating tube 2 is penetrated and rotatably connected with the firm plate, the firm plate is symmetrically connected with fixing rods, and the outer end of the fixing rod is fixed on the side wall of the tank body 1.

25 When implementing the invention: During the implementation, firstly, salvage the floating objects on the upper side of the tank body 1, at this time, start the water pump 24, the water pump 24 pumps the water in the tank body 1 into the water supply hose 23, and then enters the water tube 22, and is discharged through the water outlet 25, the water ejected from the water outlet 25 drives the floating objects to flow, and the floating objects will finally enters the collecting tank 28 along the side wall of the tank body 1. Then start the electric
30 telescopic rod 93, the electric telescopic rod 93 will drive the movable rod 92 to rotate, the other end of the movable rod 92 will drive the lifting rod 91 to rise, and the lifting rod 91 will drive the filter plate 29 to rise, so as to realize the salvage of floating objects, this method has

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the advantages of convenient and fast, time-saving and labor-saving, and safe to use. The
sludge at the bottom of the tank needs to be cleaned when the sewage tank has been used for a
period of time, then the second motor 21 drives the second driving bevel gear 20 to rotate, the
second driving bevel gear 20 drives the second driven bevel gear 19 to rotate, the rotation of
5 the second driven bevel gear 19 will drive the rotation of the sleeve 11, and the rotation of the
sleeve 11 will drive the rotation of the connecting rod 12 and the strip scraper 13, so that a
small amount of sludge attached to the upper side of the diversion bucket 8 is mixed with
water to form a sewage. During the process of sedimentation, the sewage enters the bottom of
the tank body through the electric water valve 10, and then closes the electric water valve 10,
10 the electric water valve 10 uses a large electric water valve, and then starts the first motor 18,
the first motor 18 drives the rotating tube 2 to rotate through the first driving bevel gear 17 and
the first driven bevel gear 16, and the rotating tube 2 drives the stirring rod 3 and the
arc-shaped scraper 4 to rotate, so as to puddle the water at the bottom of the tank body 1 to
form a slurry. The arc-shaped scraper 4 scrapes off the sludge attached to the wall of the tank
15 body 1, so as to make the sludge cleaning more thorough and make the sludge cleaning effect
better. Finally, start the sewage pump 27, and the sewage pump 27 will pump out the slurry, so
as to realize the sludge cleaning of the sewage treatment tank. This method has the advantages
of convenient and fast, low cleaning cost, time-saving and labor-saving.

Specific examples are used in this article to illustrate the principles and embodiments of
20 the invention. The descriptions of the above embodiments are only used to help understand the
method and core idea of the invention; meanwhile, according to the idea of the invention,
there will be some changes in the specific embodiments and application scope for those
ordinary technical personnel in the field. In summary, the content of the descriptions should
not be understood as a limitation to the invention.

Claims

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1. A new sludge cleaning device for sewage treatment tank, comprising a tank body, which is characterized in that: The lower part of the tank body is provided with a hemispherical structure, the bottom of the tank body is provided with a support frame, the upper side of the support frame is rotatably connected with a rotating tube, the lower part of the rotating tube is symmetrically provided with stirring rods, the outer end of the stirring rod is fixed with an arc-shaped scraper, the middle part of the rotating tube is penetrated with a circular plate, the lower side of the circular plate is installed with a number of electric water valves, the upper side of the circular plate is fixed with a diversion bucket, the upper side of the circular plate is rotatably connected with a sleeve, the sleeve is sleeved on the outside of the rotating tube and is rotatably connected with the rotating tube, the lower end of the sleeve is symmetrically provided with connecting rods, the outer end of the connecting rod is provided with a strip scraper, the outer end of the strip scraper is provided with a sliding head, the middle part of the tank body is provided with a chute, the sliding head slides on the inner side of the chute, the upper end of the rotating tube is provided with a first driven bevel gear, the left side of the first driven bevel gear is meshed with a first driving bevel gear, the left side of the first driving bevel gear is meshed with a first motor, the upper end of the sleeve is fixed with a second driven bevel gear, the right side of the second driven bevel gear is meshed with a second driving bevel gear, the right side of the second driving bevel gear is connected with a second motor, the upper side of the tank body is provided with a walking bridge, the lower side of the walking bridge is symmetrically provided with water tubes, the upper middle part of the water tube is connected with a water supply hose, the upper end of the water supply hose is installed with a water pump, the side of the water tube away from the walking bridge is provided with a number of water outlets, the tank body is symmetrically provided with collecting tanks, the middle part of the collecting tank is provided with a filter plate, the upper side of the filter plate is provided with a lifting assembly, the inner side of the rotating tube is penetrated and rotatably connected with a sewage tube, the lower end of the sewage tube is provided at the bottom of the tank body, and the upper end of the sewage tube is provided with a sewage pump.

2. The sludge cleaning device for sewage treatment tank as described in Claim 1, which is characterized in that: The lifting assembly comprises a lifting rod, the upper end of the lifting rod is hinged with a connecting rod, the lower side of one end of the connecting rod away from the lifting rod is fixed with an electric telescopic rod, the left side of the electric

Claims

telescopic rod is provided with a hinge rod, the upper end of the hinge rod is hinged with the connecting rod, and the lifting rod is fixedly connected with the filter plate. LU501588

3. The sludge cleaning device for sewage treatment tank as described in Claim 1, which is characterized in that: The number of the electric water valves is 3-5.

5 4. The sludge cleaning device for sewage treatment tank as described in Claim 1, which is characterized in that: The support frame comprises a support plate, the lower side of the support plate is symmetrically fixed with support rods, and the lower end of the support rod is fixed at the bottom of the tank body.

10 5. The sludge cleaning device for sewage treatment tank as described in Claim 1, which is characterized in that: The lower side of the diversion bucket is evenly provided with a number of horizontal struts, and the outer end of the horizontal struts is fixedly connected with the side wall of the tank body.

15 6. The sludge cleaning device for sewage treatment tank as described in Claim 1, which is characterized in that: The upper side of the middle part of the walking bridge is provided with a shell, the first motor, the second motor, the first driving bevel gear, the first driven bevel gear, the second driving bevel gear and the second driven bevel gear are provided on the inner side of the shell, and the lower side of the first motor and the second motor are provided with a base.

20 7. The sludge cleaning device for sewage treatment tank as described in Claim 1, which is characterized in that: The lower part of the rotating tube is provided with a firm plate, the rotating tube is penetrated and rotatably connected with the firm plate, the firm plate is symmetrically connected with fixing rods, and the outer end of the fixing rod is fixed on the side wall of the tank body.

REVENDECATIONS

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1. Un nouveau type de dispositif de nettoyage des boues du réservoir de traitement des eaux usées, y compris le corps du , qui se caractérise par: La partie inférieure du réservoir est munie d' une structure hémisphérique, le fond de la piscine est muni d' un cadre de support, le côté supérieur du cadre de support est relié à un tube rotatif, la partie inférieure du tube rotatif est symétriquement à gauche et à droite munie d' une tige d' agitation, l' extrémité extérieure de la tige d' agitation est fixée avec un racleur à arc, le milieu du tube rotatif traverse une plaque circulaire, le côté inférieur de la plaque circulaire est installé avec plusieurs vannes d' eau électriques, le côté supérieur de la plaque circulaire est fixé avec un godet de dérivation, la connexion de rotation latérale de la plaque circulaire est connectée au manchon, le manchon est fourni à l' extérieur du tube rotatif et est relié à la rotation du tube rotatif, l' extrémité inférieure du manchon est symétriquement à gauche et à droite munie d' une bielle, l' extrémité extérieure de la bielle est munie d' un racleur à bandes, l' extrémité extérieure du racleur à bandes est munie d' une tête coulissante, le milieu du corps du réservoir est muni d' une goulotte, la tête coulissante glisse à l' intérieur de la goulotte, l' extrémité supérieure du tube rotatif est munie d' un premier engrenage conique entraîné, le premier engrenage conique entraîné est engagé sur le côté gauche du premier engrenage conique actif, le premier engrenage conique actif est engagé sur le côté gauche du premier moteur, l' extrémité supérieure du manchon est fixée avec un deuxième engrenage conique entraîné, le deuxième engrenage conique entraîné est engagé sur le côté droit du deuxième engrenage conique actif, le deuxième engrenage conique actif est connecté au côté droit du deuxième moteur, le côté supérieur du corps du réservoir est fourni avec un pont piétonnier, le côté inférieur du pont piétonnier est symétriquement à gauche et à droite fourni avec un tuyau d' eau, le côté supérieur du tuyau d' eau est relié au tuyau d' eau supérieur, l' extrémité supérieure du tuyau d' eau est installée avec une pompe à eau, le tuyau d' eau est équipé de plusieurs sorties d' eau d' un côté du pont piétonnier, le corps du réservoir est ouvert symétriquement à gauche et à droite avec un réservoir de collecte, le milieu du réservoir de collecte est muni d' une plaque filtrante, le côté supérieur de la plaque filtrante est muni d' un ensemble de levage, le côté intérieur du tuyau

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rotatif traverse et la rotation est connectée au tuyau d'égout, l'extrémité inférieure du tuyau d'égout est fournie au fond du réservoir, le tuyau d'égout est installé à l'extrémité supérieure de la pompe d'égout.

2. Le dispositif de nettoyage des boues du réservoir de traitement des eaux usées selon l'article de la Déclaration des Droits, dans lequel: Le composant de levage comprend une tige de levage, l'extrémité supérieure de la tige de levage est articulée avec une bielle, la bielle éloignée de l'extrémité inférieure de la tige de levage est fixée avec une tige télescopique électrique, le côté gauche de la tige télescopique électrique est muni d'une tige articulée, l'extrémité supérieure de la tige articulée est articulée avec la bielle, la tige de levage est fixée à la plaque filtrante.

3. Le dispositif de nettoyage des boues du réservoir de traitement des eaux usées selon l'article de la Déclaration des Droits, dans lequel: Le nombre de vannes d'eau électriques est de 3 à 5.

4. Le dispositif de nettoyage des boues du réservoir de traitement des eaux usées selon l'article de la Déclaration des Droits, dans lequel: Le cadre de support comprend une plaque de support, le côté inférieur de la plaque de support est fixé symétriquement à gauche et à droite avec une tige de support, l'extrémité inférieure de la tige de support est fixée au fond du réservoir.

5. Le dispositif de nettoyage des boues du réservoir de traitement des eaux usées selon l'article de la Déclaration des Droits, dans lequel: Le côté inférieur du godet de dérivation est uniformément pourvu de plusieurs jambes horizontales, l'extrémité extérieure de la jambe horizontale est reliée de manière fixe à la paroi latérale du corps du réservoir.

6. Le dispositif de nettoyage des boues du réservoir de traitement des eaux usées selon l'article de la Déclaration des Droits, dans lequel: Le côté supérieur du milieu du pont piétonnier est muni d'un boîtier, le premier moteur, le deuxième moteur, le premier engrenage conique actif, le premier engrenage conique entraîné, le deuxième engrenage conique actif et le deuxième engrenage conique entraîné sont fournis sur le côté intérieur du boîtier, le côté inférieur du premier moteur et le deuxième moteur sont munis d'une base.

7. Le dispositif de nettoyage des boues du réservoir de traitement des eaux

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usées selon l' article de la Déclaration des Droits, dans lequel: La partie inférieure du tube rotatif est munie d' une plaque stable, le tube rotatif traverse et la connexion de rotation est connectée à la plaque stable, la plaque stable est reliée symétriquement à gauche et à droite avec une tige de fixation, 5 l' extrémité extérieure de la tige de fixation est fixée à la paroi latérale du réservoir.

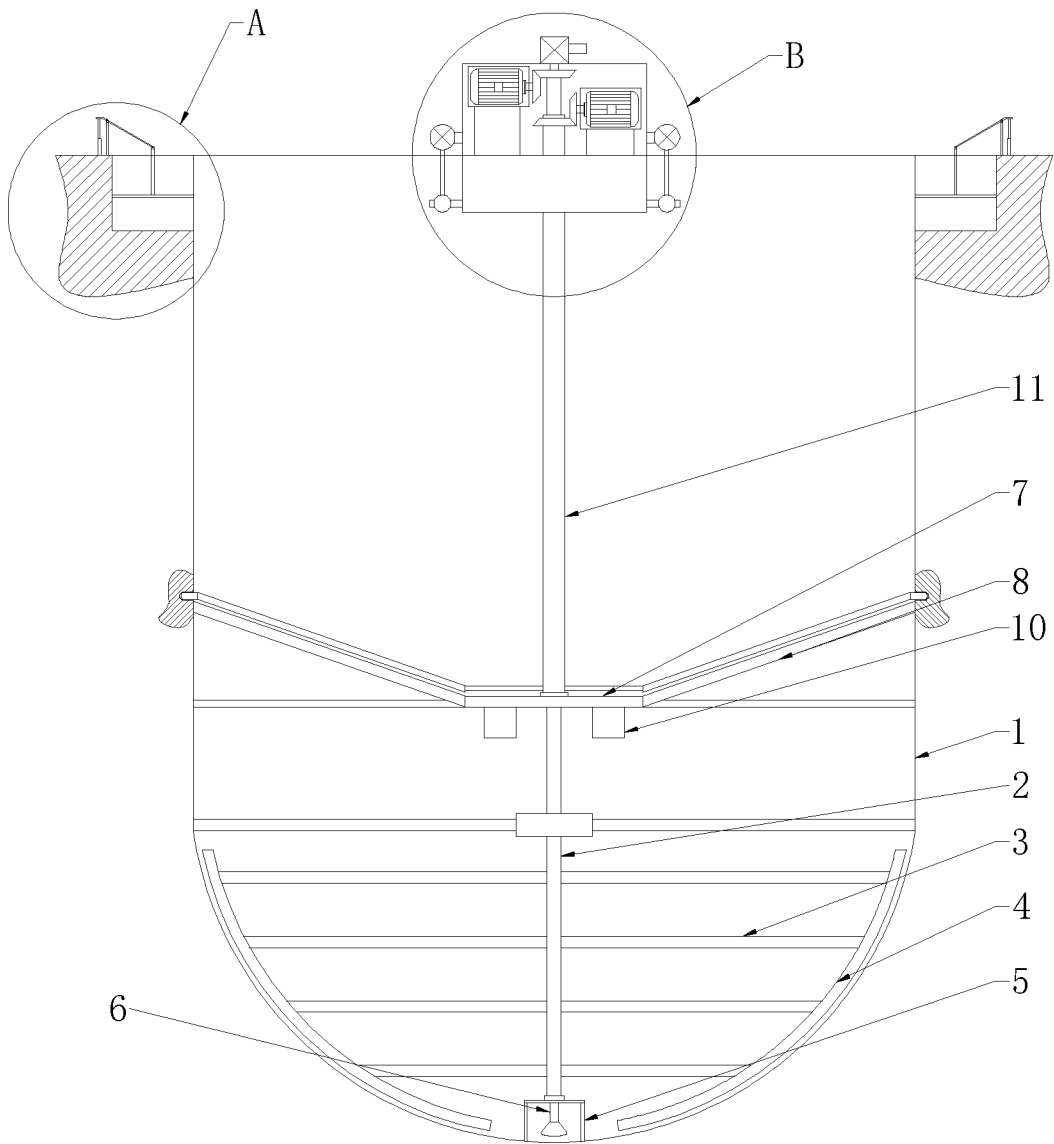


Figure 1

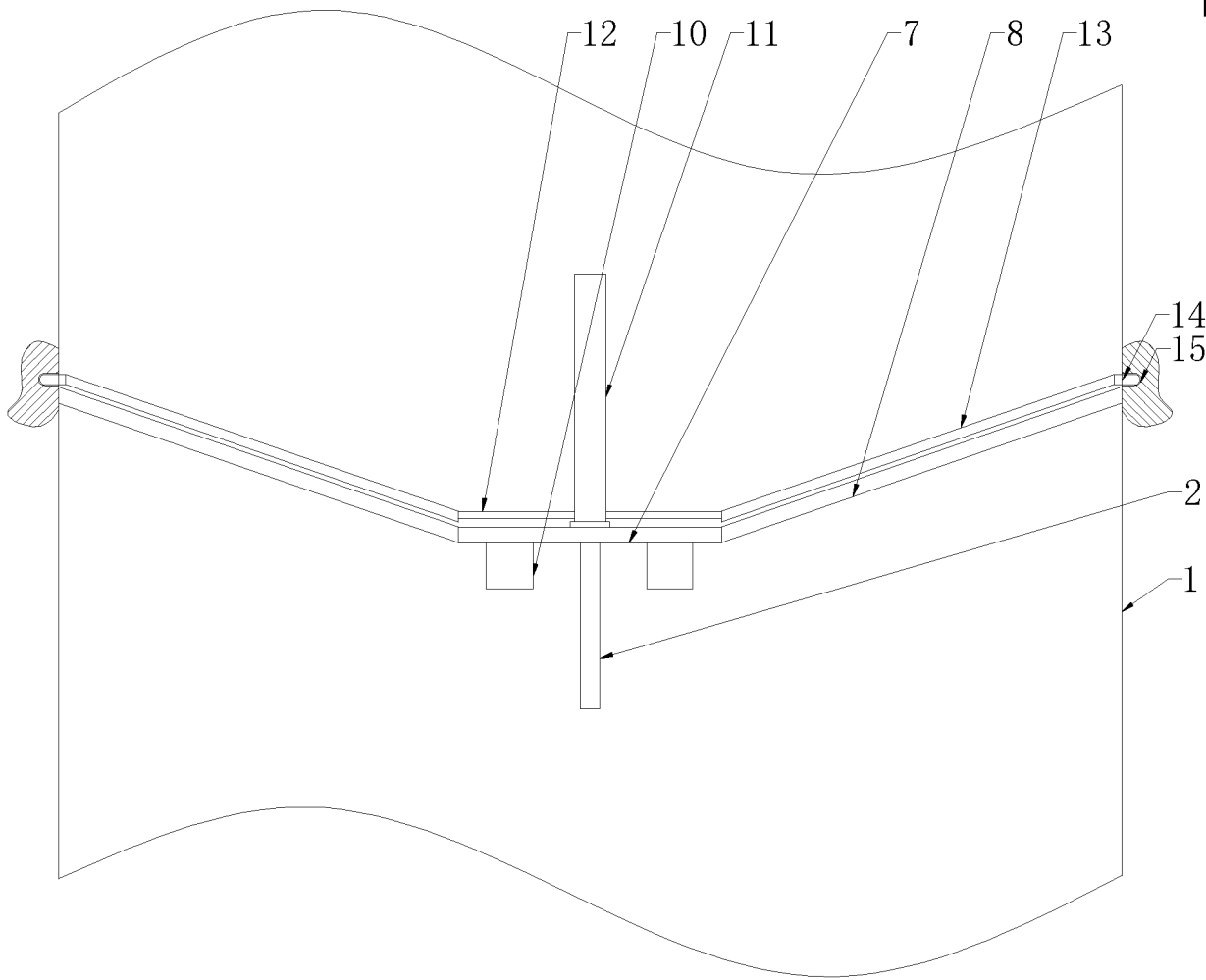


Figure 2

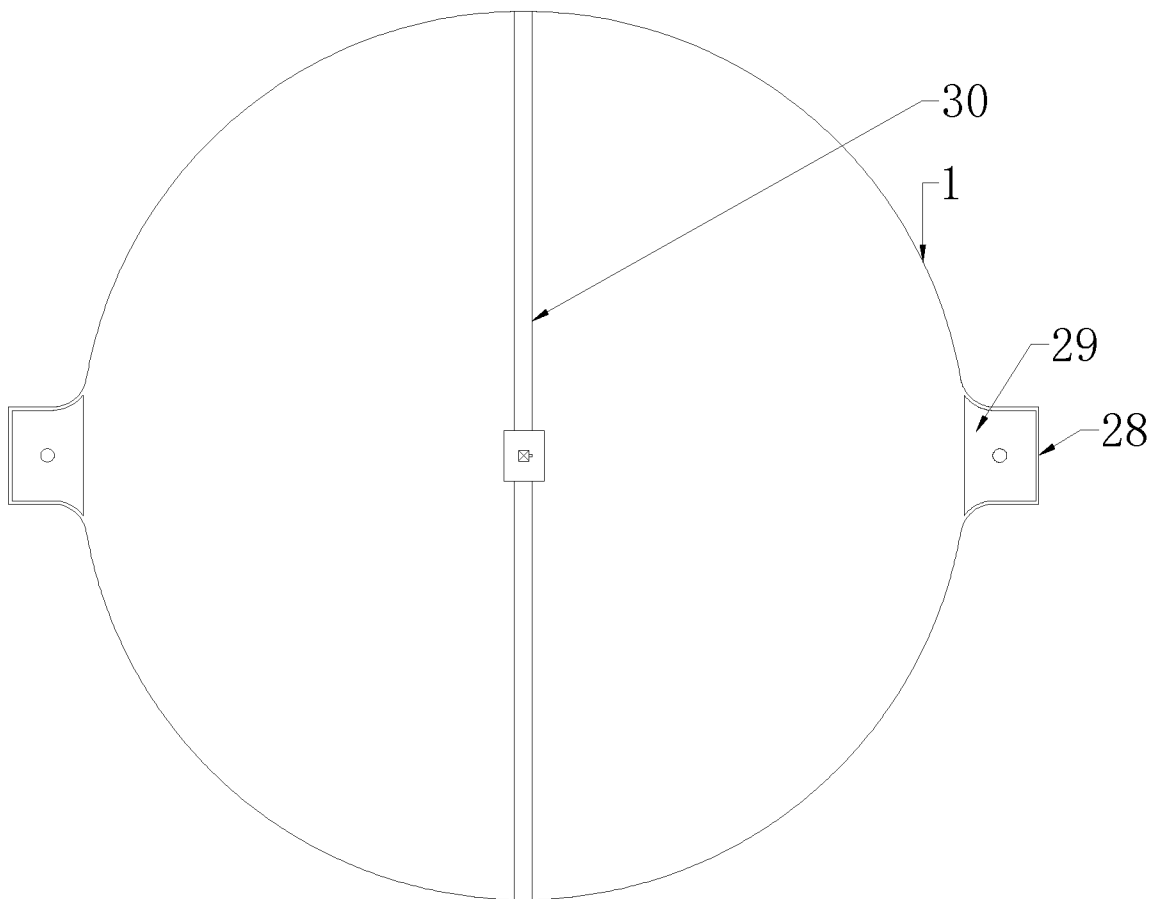


Figure 3

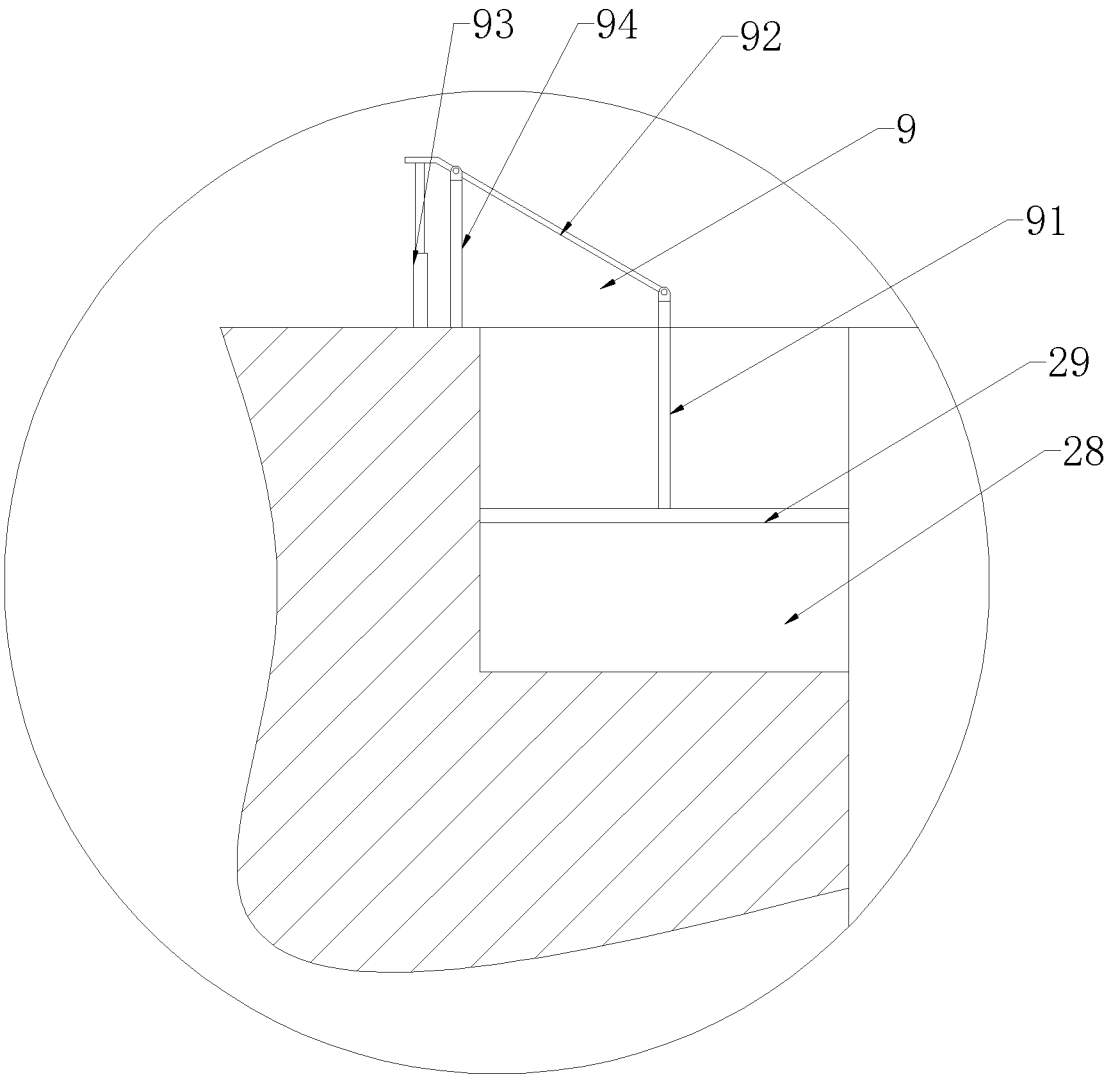


Figure 4

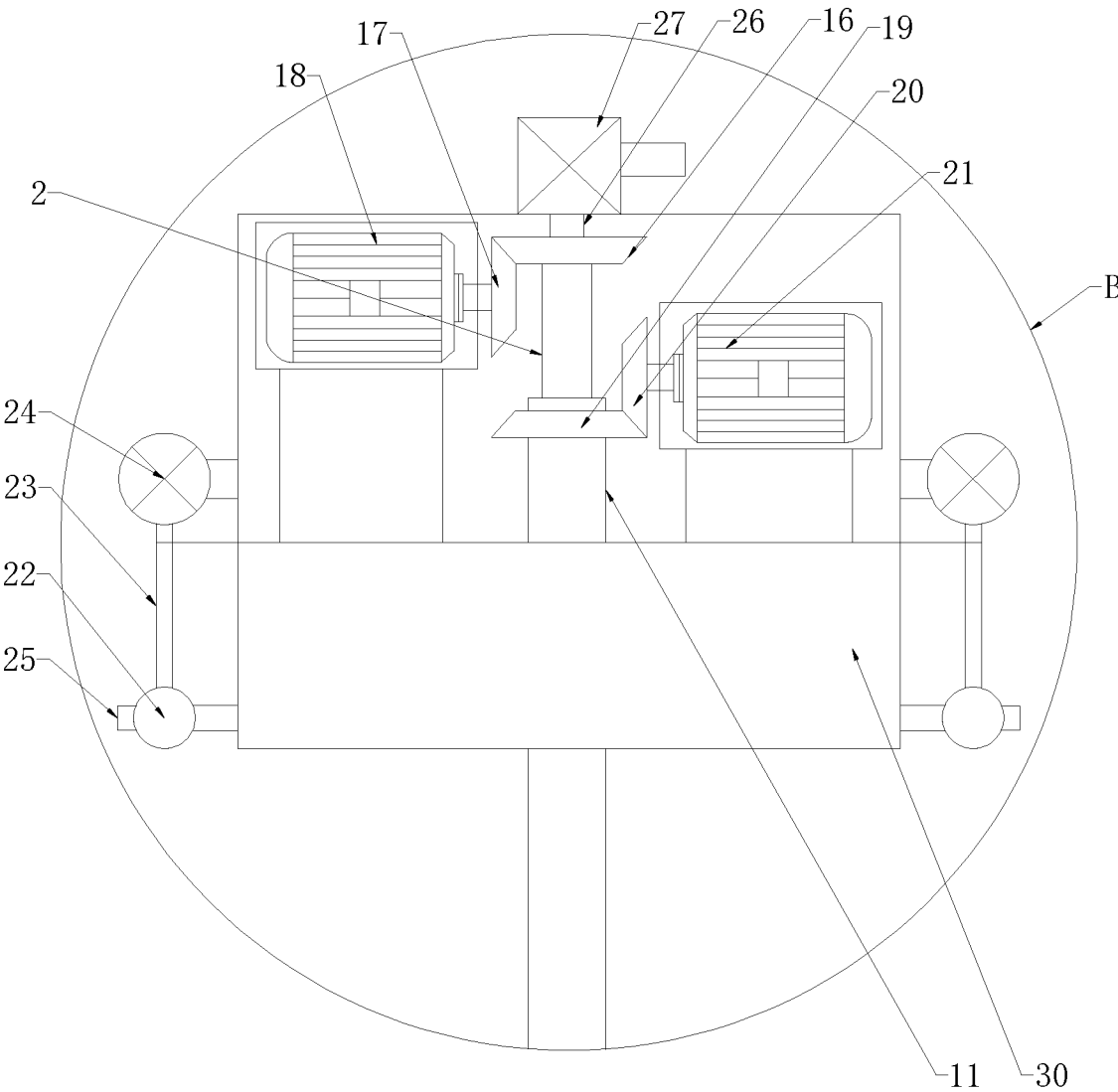


Figure 5