

SLUDGE REMOVER CAPABLE OF DRIVING SCRAPING BLADES TO CHANGE TO DIFFERENT ANGULAR POSITIONS

BACKGROUND OF THE INVENTION

5 (a) Field of the Invention

The present invention relates to a sludge remover, and more particularly to a sludge remover which is capable of driving scraping blades to change to different angular positions, wherein a usage state of the scraping blades is changed automatically through pivoting with
10 movable sliding stands, so as to largely increase a scraping efficiency.

(b) Description of the Prior Art

A contemporary water treatment facility includes a wastewater treatment facility and a raw water treatment facility. All the aforementioned facilities are provided with a precipitation pool, a
15 function of which is to precipitate suspended particles contained in water that flows in at a bottom of the pool. As time goes by, the suspended particles will be deposited into a sludge layer of a certain thickness. Therefore, the precipitation pool is further provided with a sludge collector and a scraping device to facilitate scraping the sludge toward
20 the sludge collector.

The ordinary scraping device is provided with sliding boards on rails. The sliding boards are installed with plural transversal scraping blades and surfaces of the scraping blades facing to the sludge collector are about vertical walls, whereas surfaces of the scraping blades facing back to the sludge collector are formed with slopes. The scraping device is driven by a transmission device, and the scraping blades are capable of sliding back and forth on the rails to scrape and push the sludge into the sludge collector.

When scraping the sludge, the scraping device is conducting a reciprocating planar motion at the bottom of the precipitation pool; therefore, the sludge that is deposited at the bottom of the precipitation pool will not be able to be scraped out completely, which is unable to improve the efficiency of scraping.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide a sludge remover capable of driving scraping blades to change to different angular positions, which is primarily constituted by sludge remover assemblies and scraping blades, wherein each sludge remover assembly includes lower sliding stands and upper sliding stands, and the lower sliding stands are pivoted with plural movable sliding stands

through which the lower sliding stands are able to rotate and move with respect to the upper sliding stands. Accordingly, the scraping blades that are located at the upper sliding stands move up and down, following the mutual rotation and movement between the lower sliding stands and the upper sliding stands. Hence, through that the lower sliding stands and the upper sliding stands are pivoted by the movable sliding stands and the moving direction of the scraping blades, the sludge can be scraped out successfully.

Another object of the present invention is to provide a sludge remover capable of driving scraping blades to change to different angular positions, wherein, when returning to original positions of scraping, the scraping blades will be lifted up by the movement of the upper sliding stands through the rotation of the plural movable sliding stands. Therefore, the scraping blades will escape totally from places where the sludge is present, thereby completely preventing the sludge to be pushed to original positions after being pushed away, and largely improving a work efficiency.

Still another object of the present invention is provide a sludge remover capable of driving scraping blades to change to different angular positions, wherein, as this kind of structure is simple, cost of

re-manufacturing is extremely low, and the scraping effect is much higher than that of the conventional sludge remover.

To enable a further understanding of the said objectives and the technological methods of the invention herein, the brief description of the drawings below is followed by the detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a three-dimensional view of a preferred embodiment of the present invention.

10 FIG. 1A-1 shows a schematic view of local blow-up of a sludge remover assembly which moves to scrape sludge, according to the present invention.

FIG. 1A-2 shows a schematic view of local blow-up of movable sliding stands which rotate to drive an upper sliding stand, according to the present invention.

FIG. 2 shows a flow diagram of a preferred embodiment of the present invention.

FIG. 3 shows a schematic view of rotation of movable sliding stands of the present invention.

20 FIG. 4 shows a first schematic view of local blow-up of a sludge remover

assembly of another embodiment of the present invention, which moves to scrape sludge.

FIG. 5 shows a second schematic view of local blow-up of a sludge remover assembly of another embodiment of the present invention,
5 which moves to scrape sludge.

FIG. 6 shows a flow diagram of a sludge remover assembly of another embodiment of the present invention, which moves to scrape sludge.

FIG. 7 shows a first schematic view of local blow-up of a sludge remover assembly of still another embodiment of the present invention, which
10 moves to scrape sludge.

FIG. 8 shows a second schematic view of local blow-up of a sludge remover assembly of still another embodiment of the present invention, which moves to scrape sludge.

FIG. 9 shows a third schematic view of local blow-up of a sludge
15 remover assembly of still another embodiment of the present invention, which moves to scrape sludge.

FIG. 10 shows a flow diagram of a sludge remover assembly of still another embodiment of the present invention, which moves to scrape sludge.

20 FIG. 11 shows a schematic view of rotation of movable sliding stands of

still another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, FIG. 1A-1 and FIG. 1A-2, it shows a three-dimensional view of a preferred embodiment, a schematic view of
5 local blow-up of a sludge remover assembly which moves to scrape sludge and a schematic view of local blow-up of movable sliding stands which rotate to drive an upper sliding stand, according to the present invention. The present invention is a sludge remover capable of driving
10 scraping blades to change to different angular positions 1, comprising primarily sludge remover assemblies 2 and scraping blades 3, wherein each sludge remover assembly 2 includes lower sliding stands 20 and upper sliding stands 22, whereas the lower sliding stands 20 are pivoted
15 with plural movable sliding stands 24 through which the lower standing stands 20 can rotate and move with respect to the upper sliding stands 22. A side of each lower sliding stand 20 is provided with a push stopper 25, and a side of each movable sliding stand 24 is further fixed with the
20 scraping blade 3, a rotation position of which is changed according to a moving direction of the sludge remover assembly 2 and following the movable sliding stand 24, thereby that the scraping blades 3 on the upper sliding stands 22 can move up and down following mutual rotation

and movement between the lower sliding stands 20 and the upper sliding stands 22. Accordingly, through that the lower sliding stands 20 and the upper sliding stands 22 are pivoted by the movable sliding stands 24 and the moving direction of the scraping blades 3, sludge 4
5 can be scraped out successfully.

Referring to FIG. 2 and FIG. 3, it shows a flow diagram of a preferred embodiment and a schematic view of rotation of movable sliding stands, according to the present invention. When an operator is to remove the sludge 4, he or she moves the sludge remover assembly 2
10 toward a direction where the sludge 4 is present. At this time, the scraping blades 3 that are connected with the movable sliding stands 24 will push the sludge 4 away from original positions and concentrate the sludge 4 at a pre-determined location.

After the sludge remover assembly 2 has been pushed to the
15 pre-determined location, the movable sliding stands 24 that are pivoted by the upper sliding stands 22 will rotate and enable the upper sliding stands 22 to rotate upward and to separate with the lower sliding stands 20. In a mean time, the scraping blades 3 that are located on the movable sliding stands 24 move upward simultaneously and separate
20 with the sludge 4, so as to prevent the sludge 4 from being pushed back

to the original positions when the sludge remover assembly 2 moves back to the original location.

After the upper sliding stands 22, which are driven by the movable sliding stands 24, have accomplished the upward movement, the entire
5 sludge remover assembly 2 will move toward the original position. When the sludge remover assembly 2 has reached the original position, the movable sliding stands 24 begin to rotate again; whereas, the upper sliding stands 22 move downward at a same time and are attached with the lower sliding stands 20. At this time, the scraping blades 3 that are
10 provided on the movable sliding stands 24 move downward associatively and are aligned with bottom surfaces of the lower sliding stands 20. After that, the entire sludge remover assembly 2 will move toward a place for cleaning to scrape out the sludge 4. Through the aforementioned procedure, a cleaning effect can be achieved quickly
15 and an overall work efficiency can be improved.

Referring to FIGS. 4 to 6, it shows a first schematic view of local blow-up, a second schematic view of local blow-up and a flow diagram, of a sludge remover assembly of another embodiment of the present invention, which moves to scrape. Scraping blades 3a are further fixed
20 on upper sliding stands 22a, and movable sliding stands 24a are pivoted

at places close to the scraping blades 3a. By the movable sliding stands 24a, the upper sliding stands 22a and lower sliding stands 20a can rotate and displace; whereas, the scraping blades 3a that are located at the upper sliding stands 22a can move along a same direction as the
5 upper sliding stands 22a.

When a sludge remover assembly 2a accomplishes pushing sludge 4a and is about to return to an original position, the upper sliding stands 22a, by the movable sliding stands 24a, will escape from the lower sliding stands 20a and at a same time, change an angle of rotation,
10 allowing the scraping blades 3a to rotate upward through the movable sliding stands 24a, thereby preventing the sludge 4a from being pushed back to original positions again.

Referring to FIGS. 7 to 11, it shows a first schematic view of local blow-up, a second schematic view of local blow-up, a third schematic
15 view of local blow-up and a flow diagram, of a sludge remover assembly of still another embodiment of the present invention, which moves to scrape sludge, as well as a schematic view of rotation of movable sliding stands of still another embodiment of the present invention. Each scraping blade 3b is further fixed at a side of each upper sliding stand
20 22b, is pivoted by a pivot 26b and changes a rotation position according

to a moving direction of a sludge remover assembly 2b and through the pivot 26b. On the other hand, a pre-determined spacing at a side of each upper sliding stand 22b is provided with a first support crotch 23b having the pivot 26b, and each lower sliding stand 20b is provided with a
5 second support crotch 21b corresponding to the first support crotch 23b. Therefore, the scraping blades 3b can be abutted at the second support crotches 21b.

When the sludge remover assembly 2b accomplishes pushing sludge 4b and is about to return to an original position, the upper sliding
10 stands 22b will move upward through the rotation of the movable sliding stands 24b, and at this time, the scraping blades 3b will change an angle of rotation and escape from the sludge 4b, by being abutted by the second support crotches 21b and through the rotation of the pivots 26b, thereby preventing the sludge 4b from being pushed back to original
15 positions again.

It is of course to be understood that the embodiments described herein is merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the spirit and scope of the invention as
20 set forth in the following claims.

What is claimed is:

1. A sludge remover capable of driving scraping blades to change to different angular positions, comprising at least one sludge remover assembly, each of which includes lower sliding stands, with each
5 lower sliding stand having plural movable sliding stands which are pivoted at a pre-determined spacing; upper sliding stands, with each upper sliding stand corresponding to the lower sliding stand, rotating and moving through the movable sliding stands; and plural scraping blades which are assembled with the sludge remover assembly at
10 an included angle and move along a same direction as the upper sliding stands.
2. The sludge remover capable of driving scraping blades to change to different angular positions, according to claim 1, wherein a side of each lower sliding stand is provided with a push stopper to support
15 the movable sliding stand.
3. The sludge remover capable of driving scraping blades to change to different angular positions, according to claim 1, wherein each scraping blade is further fixed at a side of each movable sliding stand and changes a rotation position according to a moving
20 direction of the sludge remover assembly and following the movable

sliding stand.

4. The sludge remover capable of driving scraping blades to change to different angular positions, according to claim 1, wherein each scraping blade is further fixed at a side of each upper sliding stand,
5 is pivoted at a pre-determined spacing with a pivot and changes a rotation position according to a moving direction of the sludge remover assembly and through the pivot.
5. The sludge remover capable of driving scraping blades to change to different angular positions, according to claim 4, wherein a
10 pre-determined spacing at a side of each upper sliding stand is provided with a first support crotch having the pivot, and each lower sliding stand is provided with a second support crotch to correspond to the first support crotch.
6. The sludge remover capable of driving scraping blades to change to
15 different angular positions, according to claim 5, wherein the first support crotches are pivoted to the scraping blades and the scraping blades are abutted at the second support crotches.