Investigation on the Notch-chain-sludge collector		
Whole term	2001.7~2003.3	

(Purpose)

The notch-chain-sludge collector described in this research is a simplified sludge gathering device, developed in Finchain, Finland, and currently more than 800 of such devices are in usage all over the world. With the notch-chain type, the logical design is possible, unlike the existing chain-flight-sludge collector, and the durability and safety have been improved. In addition, due to the material and the structure being light-weight leading a reduction in the total weight, the workability has been improved. The objectives of this research were to confirm the characteristics of the notch-chain-sludge collector and to summarize the application to the rectangular settling tank of a treatment plant as a technical manual, based on the investigation on the existing system and the results from small scale experiments.

(Results)

1. Notch-chain

The structure of the notch chain is shown in figure 1. The notch chain is vertically asymmetric in the lateral view, having a pitch of 198 mm. The outer part of the notch chain has jagged surface on its right-hand side, connected to the flight board. The inner part of the notch chain has a steel component called " notch", on the left-hand side, and this component and pin of the sprocket for driving are engaged with each other, transferring the moment to the chain. Also, the center of the inner part of the notch chain, the gently-jagged surface contacts with the existing foil. The both ends of the notch chain have a linkage pin to connect each other.

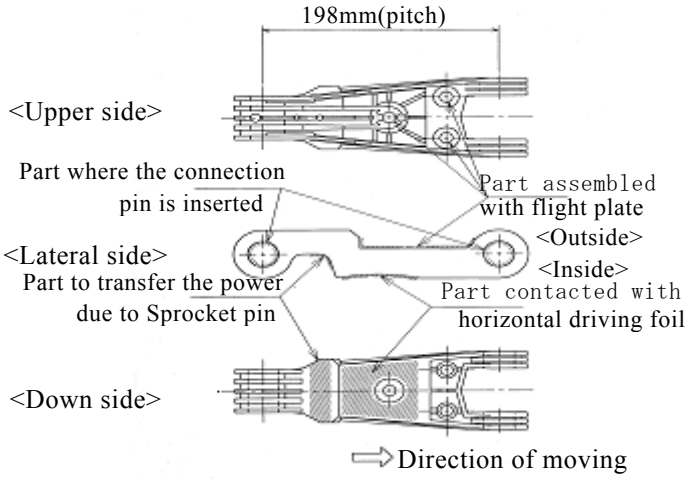

Figure 1. The schematic diagram of notch chain

2. Characteristics of the notch-chain-sludge collector

The characteristics of notch-chain-sludge collector are as follows:

(1) Durability against abrasion of the chain

The abrasive parts of the notch chain are: joint with the driving sprocket foil, joint with the existing foil, rocking point of linkage pins between two chains having different locations (figure 1). The scattered location of each abrasive point makes good abrasion-durability.

(2) Higher operational safety

In the notch-chain-sludge collector, the chain guard is equipped on the outer rim of the driving sprocket foil, preventing the chain breakaway, thus it is safer for operation. The structural characteristics of the notch chain, in which the flight board can be installed by only 3 sets of bolts and nuts without attachment, make the installation of chain guard possible.

(3) Light-weight and durability

The notch-chain-sludge collector is much lighter than that of the existing chain-flight-sludge collector. Also, resin and stainless steel are used resulting in improved durability. Being in light weight leads to the easy construction and lower cost while the durability lowers the maintenance cost.

3. Summary

It was proved that the notch-chain-sludge collector possesses a chain having an improved durability against abrasion that guarantees higher safety. Moreover, it is lighter and durable than the existing chain-flight-sludge collector. The results of this research have been summarized in the " notch-chain-sludge collector technical manual."

Collaborators: Japan Institute of Wastewater Engineering Technology
Ebara Corp., Kubota Corp., Kurita Water Industries,
Ltd., Sanki Engineering Co., Ltd., Hitachi Metals, Ltd.

Personnel in charge of the study: Tsuneto Takaso, Hiroki Matsuda, Tsuyoshi Inoue, Syuichi Masuoka

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