Island chain type brassica interception and salvage equipment

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Abstract

In recent years, the outbreak of Enteromorpha prolifera has attracted much attention. In order to solve the problem of the large area outlaws of the Enteromorpha Enteromorpha, a new type of island chain Enteromorpha interceptor and salvage integrated treatment equipment was designed, which can collect the Enteromorpha of the Enteromorpha and improve the quality of the Enteromorpha.

Keywords

Enteromorpha; island chain; interception and salvage.

1. introduction

In recent years, a large amount of Brassica mosses has often appeared in the coastal areas of the Shandong Peninsula in the summer, causing a series of environmental and ecological problems, destroying the biodiversity of the area, and will have a certain impact on the aquaculture industry and the tourism industry. However, the use of Enteromorpha in agriculture, food, medicine and other fields has been increasingly discovered. For example, Brassica has been widely used in medicine and health care products due to its functions of lowering blood fat, lowering blood sugar, and improving immunity. In order to efficiently handle the large-scale outbreak of Brassica oleracea, an island chain-type integrated treatment device for interception and salvage was designed. In the whole system, the Brassica can be transported directly on the sea surface, reducing the number of times the salvage boat sails, and reducing the high sediment content of the Brassica oleracea, increasing the efficiency and quality of Brassica moss treatment[1,2].

2. Island Chain Type Brassica Integrated Design Scheme

Brassica is a type of seaweed belonging to the genus Chrysophyta, which is a large green algae. It is green and is composed of single cells. Its ability of reproduction and adaptability to the environment are strong. It is distributed in various sea areas and estuarine environments in China. In recent years, the green tide caused by Brassica moss has become a common natural disaster in the coastal areas of the world, such as the Tokyo Bay and the Tanijin Beach in Japan, the beaches in the southwest of the Netherlands, and the coastal areas of the Shandong Peninsula in China.

The conventional methods of saliva salivation, such as centrifugal pump salvage, trawl hauling, and scorpion salvage, have resulted in low overall salvage efficiency, and salvaged Brassica oleifera has been scattered, easily producing odors, and re-contaminating the environment. In this paper, the island-chained Brassica integrated interception and salvage equipment designed in this paper can integrate the interception, salvage and pretreatment of Brassica enteromorpha to improve the salvage efficiency and the quality of Brassica accession is also relatively high.

The island chain-type integrated treatment equipment for interception and salvage of Brassica can realize the integration of the interception and salvage of Brassica moss, which can not only improve the salvaging efficiency, but also the quality of Brassica which can be obtained at the same time. As shown in Figure 1, the integrated island-type canopy interception and salvage integrated equipment mainly consists of real islands, floating islands, conveyors, protruding columns, and buoyancy adjustment mechanisms. The specific workflow is: Conveyor through the real The islands and

floating islands form a chain structure. When a large area of Brassica enters the coast, the conveyor can intercept the Brassica moss and transport the intercepted Brassica moss to the floating island or real island location in real time, and then salvage the ship. The directional collection is carried out, and the conveyor and the protruding column are the key to the whole set of equipment[3-4].

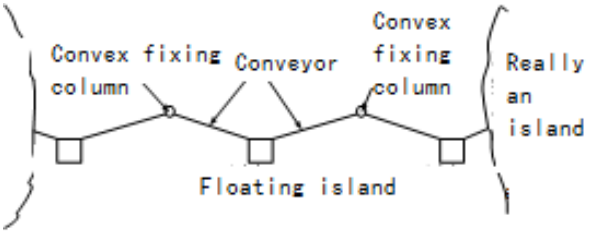

Fig.1 Island Chain Type Canola Treatment Design

3. Conveyor Design

At present, Enteromorpha intercepting net is the main way to intercept Enteromorpha prolifera. The Enteromorpha is intercepted outside the protected sea area and then salvaged. In the island chain integrated Enteromorpha treatment scheme, the intercepting and salvaging of the Enteromorpha Enteromorpha mainly use small floating conveyor, as shown in Figure 2, mainly composed of conveyer shell and conveyor scraper.

The design of the outer shell of the conveyor mainly meets the following requirements: 1) to complete the interception of the Enteromorpha, as shown in Figure 2, the arc surface of the upper end of the conveyor's outer shell can complete the interception of the Enteromorpha; 2) to complete the salvage work of the Enteromorpha, the scraper is dragged by the motor on the floating island, and the Enteromorpha can be collected with the outer shell; 3) Sufficient buoyancy is provided, and buoyancy adjustment mechanism can always keep the whole equipment floating above the water surface[5-6].

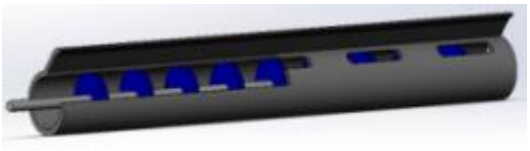

Fig.2 Design of Conveyor Scheme

4. Convex Fixed Column Design

The design of the convex columns and the floating islands is mainly designed to splice the floating conveyors to form a complete island chain and complete the enveloping and interception of the moss. The convex to the fixed column can connect the floating conveyor to a certain external angle so that the canopy is diverted at the fixed column to avoid the length of the conveyor being too long. On the other hand, the density of the canola at the floating island can be increased.

5. Island Chain Type Sphagnum Processing Equipment

5.1 Efficient Operation of Island Chain Type Canola Processing Equipment

For island chain processing equipment, according to the extent of the outbreak of Brassica oleracea, the collection rate of Brassica moss can be adjusted. The specific method is to adjust the motor of the conveyor, that is, to use an inverter motor to complete this operation. When the Brassica entered a large area, the conveyor speeded up. When the Brassica mosses drifted, the conveyor slowed down or stopped running [7].

5.2 Analysis of Benefits of Island Chained Enteromorpha Processing Equipment

The application of the island chain-type canola interception and salvage equipment can bring huge benefits, including: environmental protection benefits, economic benefits, and so on.

(1) Environmental benefits

The outbreak of Enteromorpha prolifera brings great harm to environment and ecology. On the one hand, the outlaws of the Enteromorpha will cause the reduction of oxygen in the sea water and lead to the death of the organisms; on the other hand, the Enteromorpha, covering the sea surface, will distribute the odor and destroy the landscape of the coastal zone. Therefore, the effective mode of Enteromorpha salvage is of great significance for environment and ecology.

(2) Economic benefits

The economic benefit of Enteromorpha prolifera has been gradually recognized by people, and its utilization has gradually developed towards a pluralistic direction. For example, Enteromorpha can be used as feed for livestock and poultry, as an organic fertilizer or liquid fertilizer, and as a biomass energy for biogas production and bio oil. The island chain Enteromorpha Enteromorpha intercepting and fishing equipment is to finish the salvage treatment on the sea surface, so the quality of the Enteromorpha Enteromorpha is high and the sediment content is small, so it is convenient for the later processing.

6. Conclusion

In this paper, an integrated island chain Enteromorpha interceptor and salvage integrated equipment was put forward in this paper. Through analysis, it can be used to salvage effectively the Enteromorpha, prevent the Enteromorpha and protect the coastal area, which is of great significance for the fishing of the Enteromorpha and the development and application of related equipment.

References

[1] low grade heat transfer process and Utilization - organic matter refrigerant power generation and cooling [M]. Shanghai: Shanghai Jiao Tong University press.2014.
[2] low grade thermal energy utilization technology [M]. Beijing: Chemical Industry Press.2011.
[3] Li Yunfeng, Dong Jianshan. Analysis of CDQ waste heat power generation technology [J]. coal and chemical industry, 2013,36 (2): 110- 111.
[4] Cheng Zhu Jing, Yu Hongling, Li Guojun, Li Youyou, Hui Jianming, Qu Yongkang. Thermal characteristics of high pressure natural circulation coke dry quenching waste heat boiler [J]. industrial boiler, 2006,5:8-11.
[5] Li Hengfan, Zhao Yujin, Han Zhonghe. Selection of flue gas waste heat of organic Rankine cycle [J]. thermal power generation, 2016,45 (8): 20-25.
[6] Zhai Huixing, an Qing song, Shi Lin organic Rankine cycle recycling of cement industry waste heat research [J]. China Science and technology thesis, 2016,11 (11): 1201-1205.
[7] Meng Wei, Gao Liansheng, Xiang Jian, Yi Zheng Ming. Application and research of CDQ power generation technology in Shuichang steel, [J]. metallurgy power, 2015,6:67-71.