ANALYSIS OF THE HYDROMECHANIZATION METHOD OF CLEANING

Assistant ***Nazarova Shokhida****,*
"Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"
National Research University
2nd year students ***Musoqulova Sevinch,***
Jabborqulov Asqarbek,
Bunyod Kurolov,
(members of the young technologists' circle)

Abstract: *In this article given some feedbacks, recommends, and conclusions belong to cutter head and dredger suction devices, fields of using and analyze results about patents.*

Key words: *dredger, suction device, cutter head, hydraulic or mechanic digging, transport.*

Introduction. A dredger is a piece of equipment which can dig, transport and dump a certain amount of underwater laying soil in a certain time.

The quantity of soil moved per unit of time is called Production. Dredgers can dig hydraulically or mechanically. Hydraulic digging make use of the erosive working of a water flow. For instance, a water flow generated by a dredge pump is lead via suction mouth over a sand bed. The flow will erode the sand bed and forms a sand-water mixture before it enters the suction pipe. Hydraulic digging is mostly done with special water jets. Hydraulic digging is mostly done in cohesion less soils such as silt, sand and gravel. Mechanical digging by knives, teeth or cutting edges of dredging equipment is applying to cohesive soils [1,2].

Types of dredging equipment. Dredging equipment can be divided in Mechanical Dredgers and Hydraulic Dredgers. The differences between these two types are the way that the soil is excavated; either mechanical or hydraulic, support ring to the bush, and each of them has a row of teeth arranged at radially most extreme parts of all dredgers except the trailing suction hopper dredgers are stationary dredgers, which means that they are anchored by wires or (spud)poles.

Patent №: RU 2416697 C2 suction dredger with a cutter head comprises a suction facility equipped with a suction pipe, a cutter head arranged at the free end of the suction pipe. The cutter head comprises a support ring, a bush arranged at the distance from the support ring in direction of the central axis, and also multiple knives.

The cutter suction dredger is a stationary dredger equipped with a cutter device (cutter head) which excavate the soil before it is sucked up by the flow of the dredge pump(s). During operation the dredger moves around a spud pole by pulling and slacking on the two fore sideline wires. This type of dredger is capable to dredge all kind of material and is accurate due to their movement around the spud. The spoil is mostly hydraulically transported via pipeline, but some dredgers do have barge-loading facilities as well. Sea going cutter suction dredgers have their own propulsion, however this is only used during (de) mobilization. Cutter power ranges from 50 kW up to 5000 kW, depending on the type of soil to be cut.

Patent №: RU 2246593 C1. The field is hydraulic excavation. This invention can be used at mining placer deposits of large density in underwater mines. Proposed dredger suction device consists of suctionhead with ring screen provided with rigid disk withradial slots of sector-ring shape formed by rigid nonpermeable sectors and central nonpermeable circle. Each radial slot of sector-ring shape is connected with suction head by variable cross-section hermetic channel, and total area of radial slots of sector-ring shape does not exceed area of cross-section of suction head. The effect is increased efficiency at mining placer deposits, reduced losses of valuable components of high density [3].

Patent №: RU 2260095 C1. FIELD: dredging or soil-shifting equipment,

particularly dredges or machines for rock building material production, namely for sand and gravel excavation. This erosion device comprises accumulator with nozzles arranged on suction ground receiving means and water supply pipeline connected to the accumulator. Nozzles are arranged along accumulator made as two coaxial pipes. Outer pipe is fixed and provided with archshapedwindows arranged along the tube. Inner tube may rotate relative outer one and is formed with center of gravity displaced relative axis of it rotation. Inner tube is provided with nozzles arranged in outer tube windows. Window length L is determined as $L \geq (D/2) \cdot \alpha max + d$, where D is outer pipe diameter, αmax- maximal angle of dredge frame inclination towards horizon, rad., d is outer nozzle diameter. Advantage is increased efficiency of soil loosening and enhanced ground intake conditions.

Conclusion. Summarized it can be stated that every type of dredger has its own applied working area in which its production is optimal in a technical way as well as in an economical way. It will be clear that the boundaries of these applied working areas are not strictly determined, but are also determined by other working conditions, which can differ from lob to job. Improving river dreg suction capability depends on head's embrace corner. Increasing of the embrace corner lead to expenditure's and work's rise. Also, growing up expenditure depends on local resists because of dregs and liquid in the pipe. In order to diminish local resists we need to improve enternal smooth degree of the pipe and decrease number of bends.

Literature

1. Technical aspects of large Trailing Suction Hopper Dredgers, P.J. Koert, IHC Holland
2. Ni Fusheng, ZHAO Lijuan. Two-phase flow of highly concentrated slurry in a pipeline[J]. Journal ofHydrodynamics,Ser. B,2004,16(3):325-331.
3. Ni Fusheng, ZHAO Lijuan, XU Liqun, W.J.Vlasblom, A Model Calculation for Flow Resistance in the Hydraulic Transport of Sand[C], Proceedings of the 18th WorldDredging Congress, Orlando, Florida, USA, 2007.