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УСТРОЙСТВА ДЛЯ РАБОТЫ С ПОЖАРНЫМИ РУКАВАМИ

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DEVICES FOR WORKING WITH FIRE HOSES

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Аннотация*: В статье рассматривается устройства для очистки напорных пожарных рукавов в процессе тушения пожаров от различных загрязнений, с использованием переносной интенсивной мойки.*

Ключевые фразы: *мойка, интенсивная, нарез подачи воды, напор воды.*

Abstract: *The article discusses devices for cleaning pressure fire hoses in the process of extinguishing fires from various contaminants, using portable intensive washing.*

Key phrases: *washing, intensive, water supply cut, water pressure.*

After extinguishing a fire or after training in fire and rescue units, and hose stations, dirty hoses must be cleaned of dirt. To do this, fill the bathtub with water or detergent. The size of the metal bath should be 0.5 m high, 1.5 m wide and 6 m long. The edges of the bath are covered with materials with a lower friction coefficient and a garbage disposal device is installed at the bottom of the bath. After wetting the sleeve in the bath, they are

fed into the sleeve washing machine. The washing machine consists of a centrifugal disk or cylindrical brush and a liquid supply device.

Prompt and intensive cleaning of various contaminants from fire hoses accumulated in the process of extinguishing fires is possible using a portable intensive washing machine. Due to the small weight of the device, the use of compact and mobile equipment is possible directly at the fire extinguishing site.

This article outlines new devices developed by the teaching staff of the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan for cleaning dirt from fire hoses of various sections (51, 66, 77). Fire hoses become heavily contaminated after fire and rescue operations; to return them to their previous combat position, it is necessary to clean them under an intense flow of water. Cleaning dirt from fire hoses with water is a portable device for washing fire hoses. This device is designed to quickly and effectively clean the surface of a fire hose from various types of contaminants. The device is useful for cleaning the hose most often used in fire and rescue units with a cross-sectional diameter of 51, 66, 77 m and others (Fig. 2).

Intensive washing for fire hoses is convenient during operation; it can be connected to a water supply system, a fire truck and other sources of water supply.

Overall dimensions of intensive washing: length – 28.5 cm, width – 29.5 cm, height – 27.5 cm. (Fig. 1)

The outer and inner parts of the sink were made of 0.8 mm thick metal, the inside was treated with an anti-corrosion coating, and the outside was treated with waterproof paint.

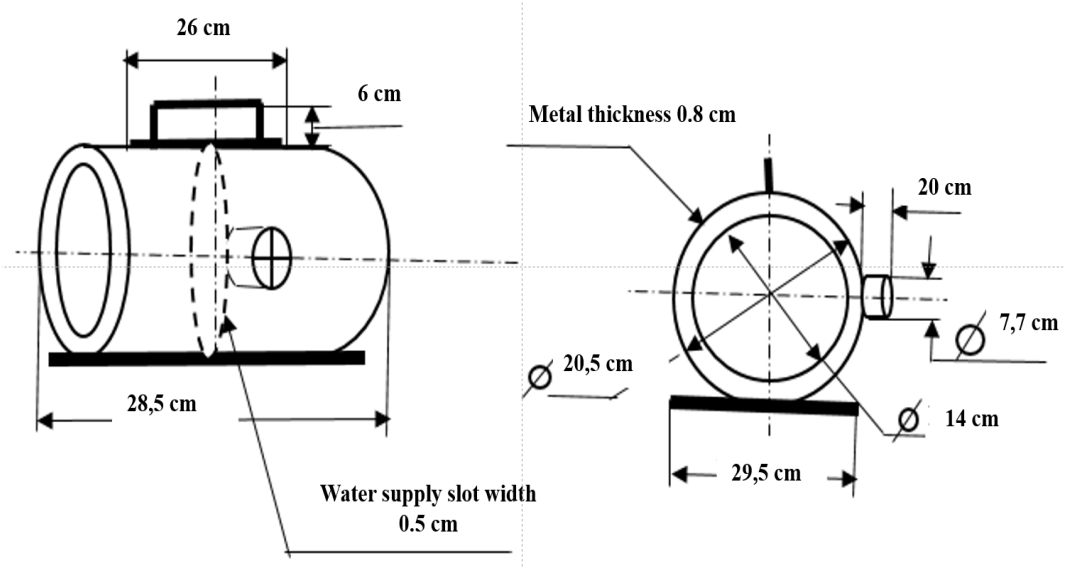

Fig.1. Main dimensions of intensive cleaning fire hose

In the 6.5 cm thick gap between the inner and outer parts, water flows with high pressure depending on the water pressure. The body has two side openings: an outlet (left for supplying a dirty hose) and an inlet (right for receiving a clean hose), for supplying fire hoses with spray threads 0.5 cm wide along the inside with a thread slope of 450 to the left.

Rice. 2. General view of the device for intensive washing of fire hoses.

Water is supplied under pressure from 1.0 to 4.5 atm. from the outer coupling head (GM), when a dirty hose is fed from the left side, under the pressure of water, the hose itself is pushed off and comes out on the right side, we clean it. The sink body is equipped with a handle for ease of carrying and an inlet with a coupling connecting head (GM-77). At the bottom there is a support made of solid metal 0.8 cm thick to support intensive washing. In addition, to ensure that intensive washing remains stable when water is supplied with high pressure, it weighs 25 kg.

Calculation of water consumption, time spent washing one hose and cleaning speed are calculated using well-known formulas [1,2].

The area of the water supply cut inside the sink along the internal diameter is determined by the following formula:

$\omega = 2\pi r$, м^2 (1)

where π is the ratio of the circumference to the diameter of the circle, π=3.14

ω=2*3,14*7 = 43,96 = 0,0044 м^2.

Water supply speed to devices [1]

$V = \sqrt{2\,gH}$ м/с (2),

where g is the acceleration of free fall of the body, g = 9.81 m/s

H – water pressure at the entrance to the sink, m.

Water consumption is determined by the following formula:

$Q = V\,\omega$, (3).

The calculations performed showed the effectiveness of the development, the time for cleaning the dirt of the sleeve is reduced several times, so if manual cleaning using a bathtub and washing machine, the time spent is 5-7 minutes, and with the developed intensive washing device it is only 10 seconds.

Water consumption for manual cleaning using a bathtub and washing machine is 2000 - 3000 l, and for intensive washing it is 130 l/sec.

Thus, the developed cleaning device for washing fire hoses quickly and effectively cleans the surface of the fire hose from various types of contaminants.

It is proposed to equip fire and rescue units with fire hose washing devices included in the set of fire-fighting equipment.

The teaching staff of the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan continues to improve the fire hose washing device with newer developments.

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