UDC 624.1

INSTALLATION FOR PREPARATION AND TRANSPORTATION OF SOLUBLE CONSTRUCTION MIXTURES

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It is not appropriate to use bulky plastering stations [1, 2] for the construction of small objects. Small mortar mixing plants are more often used, where solutions of different composition and purpose can be prepared directly on site from dry ingredients and water and delivered to the construction site through pipelines or in special containers [3, 4, 5].

The designed installation includes two main elements: a mixer for preparing solutions from pre-dosed dry components and water and a solution pump, for pipeline transportation of the finished solution to the place of construction and equipment works. Screw and blade mixers are the most common for preparing mortars. In order to reduce overall dimensions and better and faster preparation of the solution, attention was paid to a single-shaft forced-action blade mixer that would combine high efficiency and simplicity of design. Also, taking into account the fact that the installation is intended for use in the construction of small objects that do not require the supply of mortar to a large height or length and in large quantities, a single-piston solution pump with a piston drive from the crank mechanism was designed to supply the mortar through pipelines to the place of work performed.

The layout diagram of the installation is shown in fig. 1. The mixing plant consists of a frame 1 on which two main elements are mounted: a mixer 3 and a solution pump 2, the suction nozzle of which, with the help of a sleeve, is connected to the nozzle of the mixer feed chamber.

The drive of the working bodies of the installation (blade shaft of the mixer and crank-piston mechanism of the solution pump) includes one electric motor 8. It is divided into two directions: the mixer drive and the solution pump drive. The first consists of a V-belt transmission 2 and a gearbox 3, the low-speed shaft of which is hollow with splined teeth, and the drive of the solution pump – of the electromagnetic clutch 7 and the V-belt transmission 6.

Taking into account the fact that the drive of the working bodies includes two V-belt gears, the belts of which have a tendency to lengthen during operation, tensioning devices are provided. The easiest way is to move the motor along the guides, which is used to tighten the belt drive of the mixer drive. But since the drive pulleys of two belt gears are on the same axis, when the belt gear of the mixer drive is tensioned, the belt gear of the solution pump drive will weaken. Therefore, for

tensioning the latter, a tension roller is provided, which is made in the shape of a pulley.

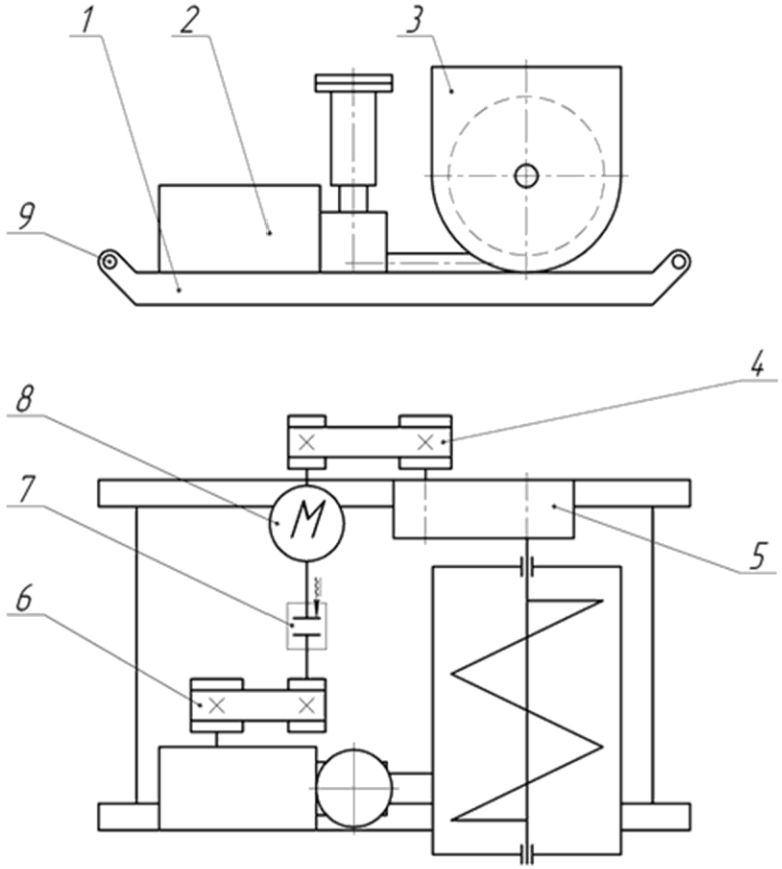

Fig. 1 - Layout diagram of the mortar mixing plant:
1 – frame; 2 – solution pump; 3 – mixer;
4 – V-belt transmission mixer drive;
5 – reducer; 6 – V-belt transmission of the solution pump drive;
7 – clutch; 8 – electric motor

For the possibility of safe lifting and lowering of the installation during transportation from one construction site to another, sling holes 9 are provided on the frame 1.

Conclusions

This development was based on a universal drive of the working body from one electric motor and a reduction in overall dimensions, which would allow you to quickly move the installation on large construction sites.

The proposed installation provides high-quality preparation of soluble construction mixtures of different mobility, which was confirmed by the conducted research, which established the dependence of the power consumption on the angular speed of rotation of the blade shaft. Rapid preparation of the solution requires an increase in engine power.

References

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