

RAW DISHWASHING MACHINES

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Abstract: This article provides information about the operating principle of food washing machines, the structure of the machines, and the technological processes involved.

Keywords: shaker washer, drum washer, brush washer, valve, pipe, barb, bunker, collector

Raw material washing machines are spray-washing; scalding-washing; scalding and spray-washing. Such washing machines are divided into several types: belt, drum, shaking, fan, brush, elevator, paddle, flotation; improved: gravity-drum, single-row and multi-row, etc.

Spray-washing and scalding machines are produced for washing dishes. They wash dishes, heat them with steam, their design is single-row and multi-row, rotary and tub.

The following technological requirements are imposed on washing machines: universality of work, cleanliness of washed objects, low consumption of water and energy, non-destructiveness and non-breakage of raw materials and dishes, mechanization of loading and unloading, simplicity, safety, etc.

Washing machines for vegetable raw materials

The degree of contamination of the surface of vegetable raw materials depends on their type. Fruits and vegetables growing above ground are cleaner than root crops. Therefore, they are washed in a gentle manner (washing with a cold water, rinsing). Heavily contaminated raw materials are washed in an active manner, that is, using mechanical action. Drinking water is used to wash vegetable raw materials.

Shaking washing machines

Shaking washing machines (F9-KM2S) wash fruits and vegetables, berries, and legumes. The machine works as follows. The raw materials first fall into the hopper (5), then onto the vibrating sieve (4). The amount of raw materials is controlled by a lever (3). Since the sieve is located at an angle, the raw materials are intensively mixed and move in the direction of the slope. Water flows from the collector (7) located above the sieve, and the contaminated water is collected in a basin (12) and sent to the drain (Figure 1).

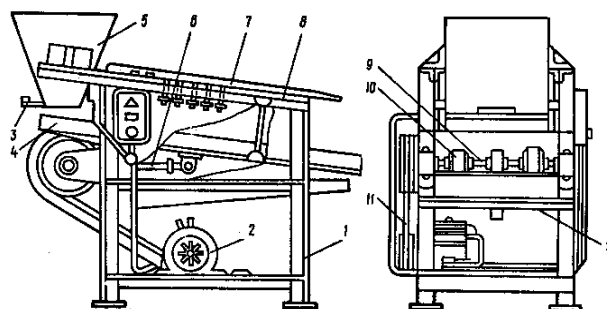


Figure 1. Washing machine A9-KM2S:

1 - frame; 2 - electric motor; 3 - screw; 4 - sieve; 5 - hopper; 6 - rod; 7 - collector; 8 - hinged suspensions; 9 - shaft; 10 - eccentric mechanism; 11 - belt; 12 - bowl

Washing machines for tomatoes and other soft-textured raw materials

Tomatoes and other soft-textured raw materials are washed in a machine of the A9-KMB brand. The machine consists of the following parts: a bath (1), a roller conveyor (3), a syringe (4), a lifter (17), a fan (9) and a motor-reducer (16). The bath is connected to two front (11) and rear (7) supports and is equipped with a hatch (13) and a valve (12). When washing the machine through the hatch, dirty water is removed when washing the raw materials through the valve. The valve is operated by a pedal (14).

The bath has an inclined grate, a roller conveyor, and an air bubbler. At the end of the roller conveyor, a special nozzle-type syringe device is installed above the bath for rinsing the raw materials. Water is supplied through a magnetic valve (5).

The roller conveyor is removed from the bath for washing and cleaning using a lift (17). The fan (9) is powered by an electric motor (8).

The machine works as follows. The raw material is poured onto an inclined grate in the bath. The raw material is moved and washed by the air flow from the bubbler under the grate. The raw material falls into the tray (15) via the roller conveyor. The fruits are washed by rubbing against each other on the roller conveyor, and finally the raw material is rinsed with clean water. From the tray, the raw material is sent to the next technological process (Figure 2).

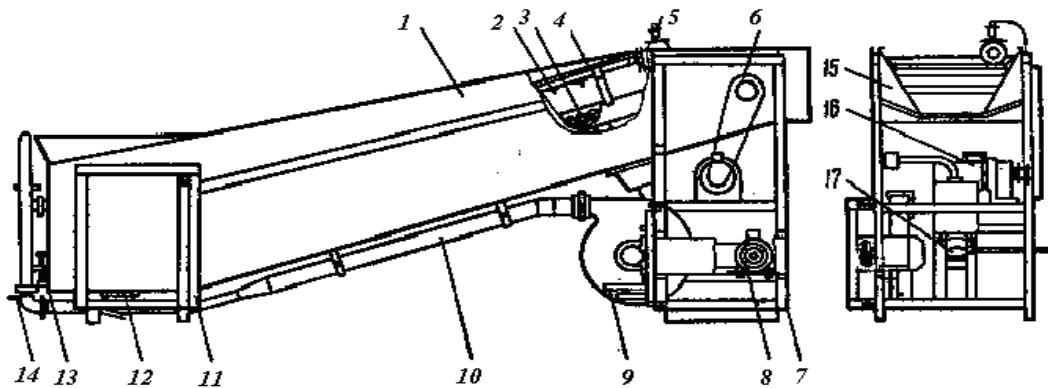


Figure 2. A9-KMB washing machine:

- 1 - tub; 2 - belt; 3 - roller conveyor; 4 - syringe; 5 - valve; 6 - lever axis; 7 - rear support; 8 - electric motor; 9 - fan; 10 - switch; 11 - front support; 12 - valve; 13 - hatch; 14 - pedal; 15 - tray; 16 - motor-reducer; 17 - lift.

Drum washing machine

A drum washing machine is used for washing fruits and vegetables with a hard consistency. The dimensions of the raw materials to be washed should not exceed 15-200 mm.

The machine is mounted on a steel frame (1). A two-part tub (2) is installed on the frame. Identical drums (4, 5) are placed in each part of the tub. A third drum (6) is mounted on a common shaft (10). All drums rotate. The surface of the drums is serrated, with holes made between them.

In the first and second drums, the raw materials are washed, impurities fall into the tub through the holes and are removed through the hatch (8). In the third drum, the raw materials are rinsed with clean water through a shower.

The raw materials fall into the receiving tray (3), the washed raw materials are sent to further processes through another tray (12). Water is supplied to the shower device through a magnetic valve (11).

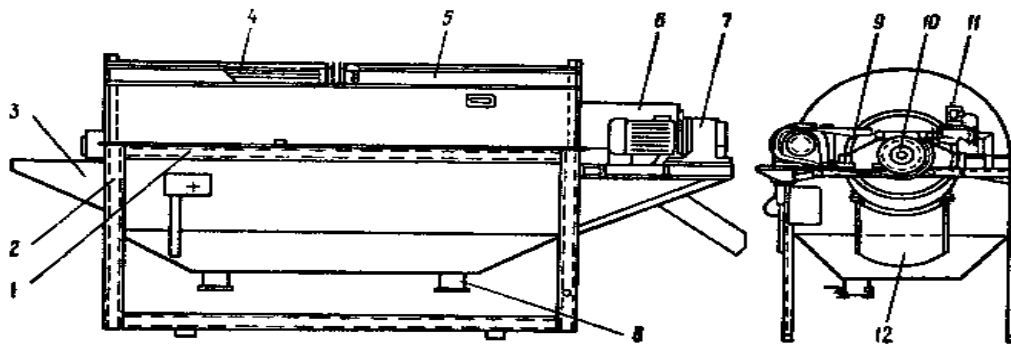


Figure 3. Drum washing machine:

- 1 - frame; 2 - tub; 3, 12 - trays; 4, 5, 6 - drums; 7 - electric motor; 8 - hatch; 9 - lever; 10 - common shaft; 11 - valve.

Brush washing machine

The brush washing machine (T1-KUM-SH) is designed for washing cucumbers, potatoes, zucchini, pome fruits.

The main part of the machine is a tub (1) mounted on 4 metal supports. Five blocks (11) are installed in the upper part of the tub, on which nylon and rubber finger brushes are assembled.

Under the blocks is a brush base consisting of five sections. Each section consists of sequentially installed films and brushes. The distance between the stationary and rotating brushes is changed using eccentrics (12).

A metal grate (13) is installed in the front part of the bath to separate foreign solids, and at the end there is an elevator (4) with a bucket (3). After the elevator, a roller conveyor is installed.

Syringe devices (2) are installed parallel to the elevator and roller conveyor. Water comes from the pipe through a valve (5), excess water is removed through a pocket (14).

The raw material falls onto the metal grate in the bath and moves under the brush blocks, where it is washed and moves with the help of the blocks to the elevator. Through the elevator, the raw material is lifted onto the roller conveyor and shaken (Fig. 4).

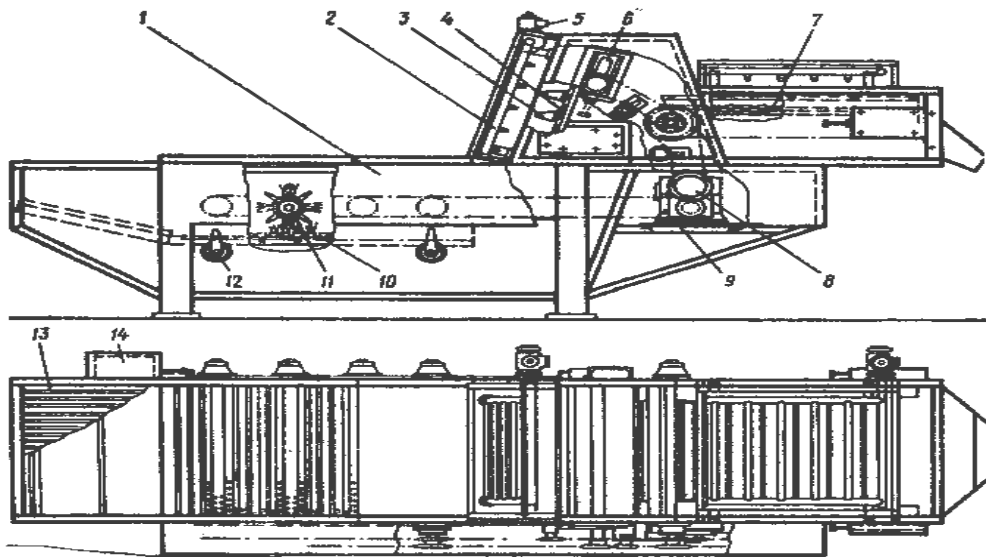


Figure 4. Brush washing machine:

- 1 - bath; 2 - syringe devices; 3 - bucket; 4 - elevator; 5 - valve; 6 - piston; 7 - drive chain; 8 - gear; 9 - electric motor; 10 - brushes; 11 - block; 12 - eccentric; 13 - metal grid; 14 - pocket

References

1. Q.O. Dodayev. I. Mamatov. Design principles and technological calculations of food canning enterprises. Textbook, Tashkent. Economics-Finance. 2006.- 208 p.
2. Dodayev Q.O. Technology of canned food products. Textbook, T.: Noshir, 2009.-387 p.
3. A.Sh. Azizov., S.Ya. Islamov. Fundamentals of equipment and design of warehouses for storage of agricultural products, processing enterprises. Tashkent “ECONOMY-FIND” 2018.
4. Mirziyoev Sh.M., Let's build a free and prosperous democratic state of Uzbekistan together. Tashkent, “Uzbekistan” National Institute of Industrial Economics, 2017– 56 p.
5. Choriyev A.J., Dodayev Q.O. Equipment of canning enterprises. Textbook, Tashkent "Uzbekistan" NMIU, 2010. -192 p. 6.
6. Choriyev A.J., Dodayev Q.O., Akhrarov U.B., Samadov O.B., Tokhtaev Sh.Q., Jumaev B.M. Technology of canned food products "Ziyo nashr-matbaa" publishing house, Tashkent - 2023
7. <http://www.gov.uz> Uz Res government portal
8. <http://www.lex.uz> Uz Res national database of legal documents
9. [http://www.plodovnie i ovoshnie konservi.](http://www.plodovnie_i_ovoshnie_konservi)
10. [http://www.ovoshnie khranilishe](http://www.ovoshnie_khranilishe)