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PULSED DRYING METHOD USING A MULTILAYER CHAMBER

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Annotation

It is known that acoustic drying and ejection increases the rate of release of moisture. The authors of this work present a newer method, which is a logical continuation of existing work. By creating pulses, hot air flow interrupters contribute to fluctuations in the product segments. A change in the direction of blowing is nektokak more rational use of the advantages of discrete drying.

Key words: acoustic drying, ejection, increases speed, hot air, pulses, flow increases.

In the process of drying the pulsation, the blown-out heated air is a compelling force for the lobules. When a lobule oscillates around a stationary equilibrium position, acceleration and surface velocity of the lobule increase relative to a moving heated gas. The probability of the transition of saturated vapors to the composition of this stream increases due to oscillations of the lobule. Newton's simple law bald enough of this phenomenon. The angle of deviation from the equilibrium position is determined by the equalized movement. An example of this is the oscillation mechanism of a cycloid pendulum (fig. 1).

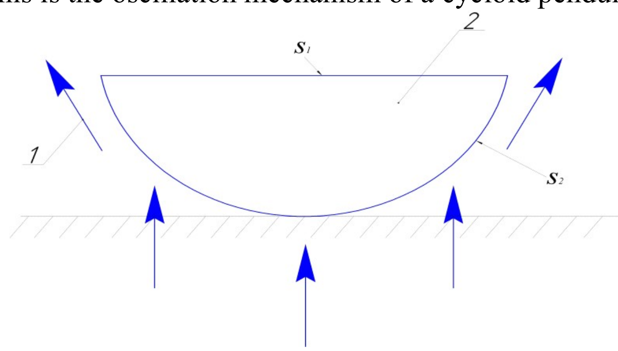

Fig 1. Sheathing with a stream of heated gas

1- Gas stick; 2 lobule; S1-lower surface; S2-top surface

W=Wk + Wn < 2mga. The ego period is $T = 2\pi\sqrt{\frac{4a}{g}}$ If the lobule has a = 2d, then T ° = 1.2 seconds. That is, such a driving force with periods of 1.2 s causes the phenomenon of resonant oscillations. An increase in the amplitude of the deviation angle is the most desirable drying effect. Near the resonant frequency we have increasing oscillations, now T ° is forced → T °, we have: an increase in the amplitude of the oscillations [1].

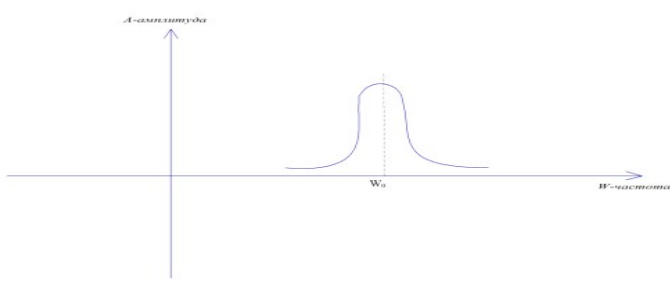

Fig. 2. The dependence of the dusty energy of a mechanical system on time has the form.

$$\frac{dW}{dt} = -л\frac{\dot{x}^2}{2} + \dot{x}F_0 cos\Omega t \qquad (1)$$

Where $l\frac{\dot{x}^2}{2} -$ is the dissipative function, $\dot{x}F_0 cos\Omega t -$is the ripple force acting on the fruit slice. Now we analyze the situation, neglecting the oscillation as a whole, they will consider changes in the distances between

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the particles of the drying material in the process of external exposure. The behavior of the lobule as an elastic material can be divided into three stages.

- the first stage is when the skeleton of the lobule is filled with moisture, and therefore the speed of the acoustic wave in such environments is close to grout of water, and gets the order of 1000-1500 m⁄s.
- the second stage is when the lobule loses half of its initial moisture. In this case, the speed of the acoustic wave decreases and gets the order of 600-700 m⁄s.
- the third stage is when the lobule is almost dry. The speed of the acoustic wave is 300-400m⁄s.

These three stages generate three natural frequencies for the elastic shells - those lobules. This dependence allows to choose the optimal frequency chopper, depending on the stage of drying. For the first stage

$$W_1 = 75 \cdot 10^3\, {rad}/{s}\,,$$
$$W_2 = 34 \cdot 10^3\, {rad}/{s}\,,$$
$$W_3 = 25 \cdot 10^3\, {rad}/{s}.$$

Those impulses for the first stage should have a breaker with a turnover with values W_1, W_2, W_3.. Even if the forcing elastic interactions do not cause a sharp reason, it demonstrates curves on the surface of the lobule associated with the difference in the forces of the action of the pulse at different points. Appears curvy vibrations and superficial elastic waves.

Let us consider, the difference between bipolar drying and regular interlayer feeding.

To do this, consider three options:

In time τ different from the usual discrete drying, those pole switching times are limited.

This is due to the fact that, at small τ, the surface does not have time to evaporate, drag and overheat. But on the other hand, it is precisely this overheating that causes food spoilage.

Therefore, the optimal period τ is determined experimentally, depending on the level of moisture content and the heat transfer coefficient of the surface of the lobule.

In this case, an increase in legal flows over time reduces the effects not associated with the limited speed of the free motion heat. In this method, one can also work as $\tau \to 0$.

In this case, the energy for drying will be rationally used, since this is energy: $E = \int_0^t E^{\text{scam}}\, dt$ is maximum, without loss during adventures. Three just a right or left drying we have a picture for a single wedge. S_1- the upper surface of the lobule, 1-gas S_2 is the lower surface of the lobule, 2 is the lobule. As can be seen, and rice (4), the area S_2 is "washed" by the flows of hot air. This applies to pro-drying. This is for grids above the stream. And for delicate grids, on the contrary, S_1 will get more heat, an entity faster than S_2.

If, alternating the supply of heated gas, those in Fig (1) after time τ, change the poles of the directions, the body of the tubes, then we get a double effect. Time τ - required switching time, controlled. Those have discrete drying, only in an enriched form, so seducing the alternation of horizontal flow directions. Cycle (2) Return Flow for Variable Poles

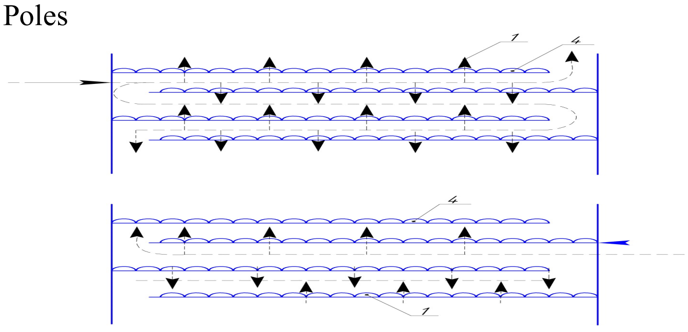

Fig. (3) Right molasses, gas directions

1 - gas flow; 2- the distance between the grid and the stack - δ; 3- chamber walls; 4- flat and mesh

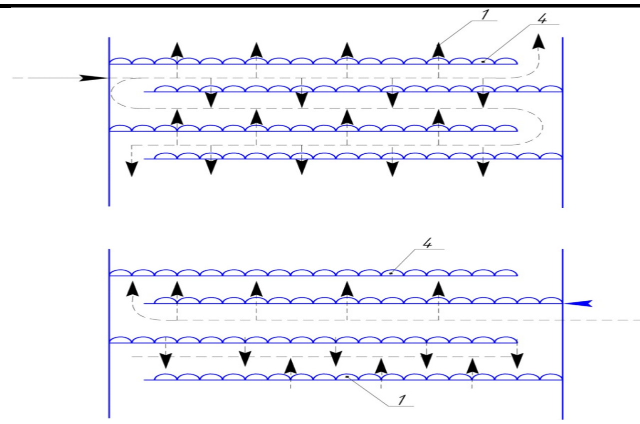

Fig. (4) Levy molasses, gas directions

1 - gas flow; 2- the distance between the grid and the stack - δ; 3- chamber walls; 4- flat and mesh

Shows the work and "washing" with heated gas slices of fruit.

The advantage of this method is not only the increase in the efficiency of heat and mass transfer for combining the poles periodically, but also controllability of the drying parameters throughout the process. Managed are:

- interrupt frequency
- interrupt speed
- the period between changes in the poles of the directions of gas flows.

-changing the distance between the grid and the walls of the casing, we change the distribution of the flow between the interlayer horizontal flows and the vertical flows bypassing the grid.

-Distance between the grid and the walls.

So, control factors were added to the gas flow rate and gas pressure, as well as its temperature. As a result, we have 7 control factors that make it possible to change the quality of the final product. We get new production opportunities for energy saving and product quality. Let us consider how bipolar drying differs from conventional interlayer unipolar methods of supplying a gas stream using Fig [1-3].

So, as illustrated fundamentally new method, generalizing discrete drying and the method of Andean oscillations; its advantage, physical megoznes and the inclusion of parameters.

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