

Measures for Operation, and Maintenance of Mixer for Culture Materials of Edible Fungus

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Abstract: This paper briefly introduces the classification and working principle of the mixer, and points out that the proper mixer should be selected according to the material in order to improve the mixing quality and efficiency. It also introduces the standard operation and daily maintenance, which can effectively extend the service life of the mixer.

1. Introduction

The main materials of edible fungus culture materials are cotton seed shell, crop straw, wood chips, etc. The supplementary materials are lime, urea, potassium dihydrogen phosphate and other mixtures. Mixer is an important equipment for preparing culture material. Its main function is to mix the main materials, supplementary materials and water evenly. If the mixer does not mix evenly, it will lead to uneven distribution of nutrient components in the culture material, and then the mycelium growth will be irregular^[1]. Therefore, when choosing mixer for culture materials of edible fungus, the types of mixing materials should be fully considered and a suitable mixer should be selected so that the mixing can be even and the equipment can run efficiently and with low consumption.

2. Classification and Working Principle of Mixer

2.1 Classification of Mixer

Edible fungus mixer can be divided into self-falling mixer and forced mixer according to mixing mode. It can be divided into vertical mixer and horizontal mixer according to component configuration, and can be divided into screw type, vane type and paddle type according to the structure of working parts. If classified according to special functions, there are acid-proof mixers, etc.

Vertical mixer has simple structure and low energy consumption. During operation, the material is taken from bottom to top by the blades on the inner wall of the mixing drum, and then falls freely to the bottom. The above actions are repeated until the materials are mixed evenly.

The mixing principle of forced mixer is that the rotating blades installed in the mixing barrel force the direction of material movement to form a cross material flow.

Acid-proof mixers is based on the process of culture material, adding steam heating system and pasteurizing materials to prevent them from rancidity [2].

In addition to mixing for ingredients separately, mixers can be equipped with conveyor for automatic feeding or with various bagging machines to form production lines, so as to effectively link production processes, improve production efficiency and save labor costs.

2.2 Working Principle of Mixer

Taking GXJB-7 horizontal mixer as an example (Figure 1), its structure mainly includes mixing drum, mixing components, cleaning mechanism, feeding mechanism, water supply pipe, driving mechanism and electrical control system, etc., which can complete mixing, water addition, discharging and cleaning. Working principle of the equipment: put materials into mixing drum and start the mixer. The drive mechanism would drive the mixing components to rotate the various

materials in the mixing drum and turn them over and over again to mix evenly. The device uses internal and external double spiral mixing structure. The internal and external spiral rings rotate in opposite direction, which is conducive to mutual penetration and transposition of materials, natural diffusion and mixing, and helps to mix materials evenly and efficiently.

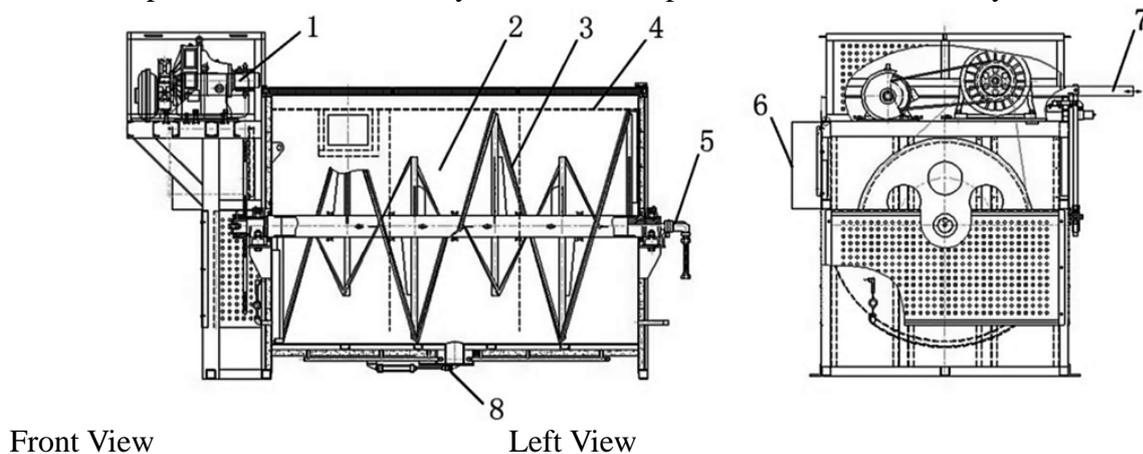
3. Use of Mixer

3.1 Installment of Mixer

After purchasing the mixer on demand, check out the box to make sure all the accessories are complete, place them in the designated working position according to the layout, read the instructions carefully, connect the parts step by step according to the requirements of the instructions, and determine whether the installation is fixed or not according to the requirements and product type. Installation of electrical appliances should be done by professional electrical technicians, and reliable wiring should be installed accurately. Do not let the general staff connect by themselves.

3.2 How to Use the Mixer

When using the mixer, the safety rules should be strictly observed and protection should be well done. The specific precautions are as follows: (1) After the mixer is installed, professional operators should be trained first, the relevant operation manual should be read carefully, and the operation content should be familiar with to prevent accidents caused by improper operation;(2) When start the mixer for the first time, make sure that the plugs are connected correctly; (3) Every time before using the mixer, check the protective devices, leakage protection, etc. to make sure that it is correct before power-on; (4) When turning off the machine for cleaning, the power supply must be cut off first to avoid injuries; (5) Check the mixing blades and other parts for bending, deforming and loosening frequently after the mixer is turn off; (6) In case of emergency or need to suspend operation, stop the device immediately or turn off the power switch immediately.



1.Driving Mechanism; 2. Mixing Tank; 3. Mixing Parts; 4. Water Supply Pipe; 5. Spindle;
6.Electrical Control Cabinet; 7.Rack; 8. Feed Gate Valve

Fig.1 Structure Diagram of Gxjb-7 Horizontal Mixer

4. Daily Maintenance of Mixer

Maintaining the mixer well in a good performance condition can reduce the damage to the parts of the mixer, reduce the failure rate and prolong its service life^[3].

4.1 Daily Maintenance

Daily maintenance of the mixer: (1) Remove the residue from the mixer barrel after each use and

keep the barrel clean; (2) After each use, check the looseness and damage of each connector, and whether the mixing blade is deformed. Daily simple maintenance not only effectively reduces the number of failures of the mixer, but also prolongs the service life of the mixer.

4.2 Periodic Inspection and Maintenance

Regular inspection and maintenance of the mixer: (1) Add oil to bearings once a week and to chains once a month; (2) After one year of use, disassemble the mixer to clean, inspect, repair, replace, adjust the transmission parts and the fragile parts so as to restore the original accuracy of the equipment.

5. Common Failures and Their Elimination of Mixer

In case of any abnormality in the operation of the mixer, it shall be handled in time. Common failures^[4] and their elimination measures are as follows: (1) when the operation is normal, but the power switch light is not on, the possible reason is that the fuse is blown out, check whether the electrical circuit and components of the mixer are intact, and replace the fuse;(2) After starting the mixer, it is found that the mixing blade is reversed. This is because the three power supplies are connected incorrectly in sequence, and the two phase lines connecting the circuit breaker shall be exchanged arbitrarily; (3) If the mixer makes abnormal noise during mixing, check whether the internal components are loose or worn, or whether there are materials in the barrel that are not required for this mixing, remove the hard materials in the barrel in time, replace the worn bearings and gears, and fasten the loose components; (4) If the vibration amplitude of the mixer is abnormal, check whether there are damaged bearings or loose components, and replace the damaged bearings or loose components in time.

The mixer is an important equipment for preparing edible fungus culture material. Regular maintenance of the mixer is an important measure to ensure the normal operation of the mixer and prolong its service life. At the same time, the operation specifications of professional personnel shall be ensured to avoid human induced production accidents as far as possible, so as to make the equipment operate with high efficiency, high quality and low consumption.

References

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