

Research status and development suggestions of Hawthorn pitting machine in China

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Abstract

Hawthorn kernel is the seed of hawthorn, its internal chemical elements and hawthorn pulp has a greater difference. Hawthorn cores has a certain medical effect, so the rational use of hawthorn cores has important significance. There are many kinds of hawthorn products in China. In the process of processing, it is often necessary to remove the core of hawthorn first. In recent years, China has also developed a number of hawthorn cores machinery, this paper will be aimed at China's existing hawthorn cores machinery research and discussion, for the development of hawthorn cores machinery to provide a certain reference. Hawthorn has been widely used in digestive medicine. In recent years, the concern of the waste pollution problem of hawthorn cores has raised a lot in china, researchers people analyzed the chemical composition of hawthorn cores, tested the medical curative effect of hawthorn cores, for the rational use of hawthorn cores provided a lot of theoretical basis. Actually early in the medical masterpiece of China "compendium of Materia Medica" in recorded the curative effect of hawthorn cores, mentioned among them hawthorn cores also has the function that can promote human body digestion and absorption, and hawthorn cores still can treat hernia. In addition, with the development of medical level and experimental conditions in recent years, we did the research of the extract of hawthorn cores, and then injected the extract into the experimental animals, found that Hawthorn cores can reduce the cholesterol in the animal body and improve the level of serum HD1-F effect.

Keywords

Hawthorn;curative effects ; reduced cholesterol mechanization; automation; hawthorn cores removal.

1. China's hawthorn cores industry status quo

1.1. Prospects of Hawthorn stone

In recent years, the area and yield of hawthorn plantation in China have been growing steadily. A large number of hawthorn plants in China are exported to South Asia and other regions, with very good economic prospects. China's hawthorn food processing industry has also developed more rapidly, due to the continuous improvement of China's level of mechanization, the production efficiency of food processing enterprises has also been greatly improved, thus

greatly promoting the efficiency of hawthorn processing. Hawthorn hawthorn cores waste from food processing industry development and environmental pollution problems got bigger concern, we will research and analyze hawthorn cores extract, then extract injection into the experimental animal observation, found in hawthorn cores can reduce the cholesterol in the body and improve the effect of the levels of serum HD1 - f, This is of great significance for us to make full use of hawthorn nucleus.

1.2. Hawthorn food processing industry to promote the development of hawthorn pitting machine

China's famous snack tanghulu is deeply loved by the general public, both children and adults have a special preference for tanghulu. Tanghulu is coated with a layer of melted and recrystallized shell, which makes it taste sweet outside and sour inside, which is very tempting to people's taste buds. This is the important reason why Tanghulu can become a famous snack in China. In addition, people also like to eat hawthorn slices, hawthorn cake, canned hawthorn and many other hawthorn processed products, hawthorn food processing industry is therefore very prosperous. The first step in the production process of these products is the need to core hawthorn, if you want to speed up the speed of hawthorn food processing, we must improve the efficiency of hawthorn core. The demand for hawthorn and its accessory products has promoted the development of hawthorn pitting machines.

2. Our existing hawthorn cores machinery example

2.1. Center positioning hawthorn core removing machine

By hebei Agricultural Technology Normal University department of Agricultural Engineering research and development of central positioning hawthorn core machine through the whole process of hawthorn core analysis, to achieve the integration of the machine operation function, its operation process can be divided into 6 steps. Feed hawthorn into the machine namely first, pass the machine next to hawthorn after undertake positioning, hold, make hawthorn maintains correct position and fix, begin to undertake cutting to hawthorn later, go cores again, can collect finished product finally. At the same time, the device can also collect waste scraps generated by processing. In addition, the physical characteristics of some hawthorn varieties were studied in this device, and the shape and mechanical properties of hawthorn were optimized to improve the precision of hawthorn cores removal and ensure the quality of hawthorn cores removal. The central positioning hawthorn core removing machine has carried on the fine classification of the device material selection, according to the different parts of the different functions and requirements, each part of the selection of the corresponding material. The device also calculated the production efficiency accurately, and proposed that the device is suitable for small and medium-sized food canning factories and other hawthorn food production plants.

2.2. Hawthorn core removing machine based on pneumatic control

College of Mechanical and Automotive Engineering, Liaocheng University developed a pneumatic control based hawthorn core removal. Through the research of the market of hawthorn seed removing machinery, they found that China's existing hawthorn seed removing machinery are mostly simple machinery manufacturing. The staff need to use the hand to press in order to achieve the purpose of to remove cores, the low degree of intelligence, increase staff's labor intensity, work efficiency is not high also, hence the use value is not big. In addition, there is a kind of machine on the market that can use an electric motor to drive the device to undertake the work of hawthorn cores removal, but this kind of machine will often require strict lubricating conditions and working environment should guarantee the parts with the requirements, the use of equipment and maintenance of the demand is higher, to the device of

buyers has brought great inconvenience, so it is hard to obtain a larger market. Through the analysis of the existing hawthorn cores machinery in China, the device to solve the existing problems, developed this machine. The device through internal device for air is compressed, compressed air to carry out cutting power, and in the compression process of compressed air in cylinder, by controlling the gain and loss of the electromagnetic directional valve after electricity, make do up and down reciprocating motion of the piston rod, cylinder drive go cores segment to complete the hawthorn cores. The advantages of this device are the ability to achieve highly automated cores removal operations, and low lubrication requirements for the device, and low maintenance requirements for the device, which can promote the development of the product sales market.

2.3. New hawthorn core removing machine

By liaoning university of science and technology school of mechanical engineering and automation research and development to a new type of hawthorn cores machine can effectively improve the work efficiency of hawthorn to go cores, the machine shall be provided by the independent transmission system and the stone removal system to complete the whole process, and the researchers are also on the application of the traditional haw to cores machinery transmission scheme optimization design, More advanced structure is adopted to achieve higher transmission efficiency and stability. The device combines a variety of advanced modern science and technology, can realize the liberation of labor, improve work efficiency, reduce production costs. In addition, the machine structure was also drawn by 3d drawing software. After the 3d model was established, the device was simulated in the virtual environment of 3d motion simulation by 3d software.

Innovative USES the device of the transmission system of the bevel gear transmission, gear transmission can utilize the advantages of high stability, guarantee the stability of the device is able to work in process, and because the gear manufacturing features and materials of the mechanical properties of the bearing capacity of the apparatus is very high, compared with the belt drive and chain drive to withstand the weight of the larger. By changing the parameters of the gear, the transmission efficiency of the gear can be improved, and the working efficiency of the device can be improved. In addition, gear has higher fatigue resistance and can maintain load stability under long working conditions, so the use of gear transmission can achieve a higher level of device life. Bevel gear is capable of realizing the transmission between two mutually perpendicular shafts, so the device can achieve a reasonable arrangement between the shafts, save the space occupied by the device, reduce the volume of the device, and make the structure of the device more compact.

For hawthorn core removal system, the transmission part of the device adopts crank connecting rod mechanism, and the rotation of the main drive shaft is driven by the rotation of the crank during the working process. In the process of work, the round tool will be squeezed out of the hawthorn cores, and then the tool through its connected slider movement, slider in this process to drive the tool up and down reciprocating movement. The mechanism through the experiment, can separate hawthorn cores bending, and in the cycle of the tool up and down movement, hawthorn turntable will also carry out the corresponding action, the whole process of the device of the core system components coordination work, realize hawthorn core automation.

2.4. Household Hawthorn pitting machine

The household Hawthorn core removing machine jointly developed by Tangshan College and Tangshan Matsushita Industrial Machinery Co., Ltd. is a small smart machine that can be applied to the family, and the machine can also drive the operation of the machine through the motor to drive the actuator to work. In this process, the machine also passes the power of the motor to the table turntable and the core knife through the transmission device, so that the machine

can achieve the effect of intermittent rotation of the table, but also to complete the reciprocating movement of the tool. The machine is designed for the family use of the core machine, so the biggest characteristics of the machine should have a simple structure, small size, convenient operation, cheap and so on.

The household hawthorn core machine consists of 4 parts, respectively for the main frame part, the driving part, the workbench part, the core part, the device only requires the operator to put hawthorn into the entrance of the machine can achieve all the subsequent operations, it can also be completed in each process after the automatic cycle. This device passes the power to each component through the motor, and the intermediate transmission mode is chain transmission, which has greater transmission stability, and the working environment requirements of the device are lower. The workbench part of the device can drive hawthorn and automatically arrange the position, after completing each operation for the next work ready. The device's core part is a crank connecting rod mechanism, can accurately core, and can perfectly cooperate with the table part to achieve accurate positioning, accurate cutting.

Different parts of the device have different requirements, so researchers through the work process, mechanical properties, working environment of each part of the analysis and research, the material of each part of the fine selection, so that the overall effect of the device is more optimized.

2.5. Design of an automatic Hawthorn core removing machine

College of Mechanical Engineering, Beihua University has developed a kind of automatic hawthorn core removing machine, mainly aimed at improving the efficiency of hawthorn core removing and innovative research and development. Through experimental studies, the researchers concluded that the device can achieve 12 times the efficiency of the human average manual hawthorn core removal.

The equipment mainly consists of a feeding device, a centralizing device, a cores removal device and a pulp and core collection device. The power of the equipment mainly comes from an electric motor, and the equipment also supplies power to the transmission device and the cutting device respectively through two electric motors. The equipment can realize one-time feeding more hawthorn, then the machine by its own structural features will be transported to the machine internal hawthorn, the machine is also equipped with wall and finishing facilities as well as, hawthorn neatly desultorily, restart the machine tool, remove the hawthorn cores, and began to prepare for the next cycle of work.

Each mechanism of the device has been innovatively designed and experimentally verified to achieve high accuracy cutting performance. At the same time, the last part of the device is to collect treated hawthorn. In this process, the device can be damaged hawthorn removed, so as to achieve a higher quality of work. The device can save a lot of labor cost for hawthorn processing manufacturers and improve the efficiency of production. The mechanical analysis of 3d modeling ensures the reliability of work and the quality of products.

3. hawthorn cores mechanization development prospect

China's hawthorn food processing industry is developing very rapidly, in addition, hawthorn is also used more in China's pharmaceutical industry, hawthorn cores also has a certain application value. In all the processing and application steps, hawthorn to the core is a very important step, but also the premise of each step. Therefore, the development of hawthorn cores machinery is very necessary. The development of hawthorn mechanization, should improve production efficiency, reduce labor intensity, the use of simple and convenient target development. China's future hawthorn cores machinery should be more automatic, multi-functional, intelligent.

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