

Research Report

(Yufeng Hui)

20240409

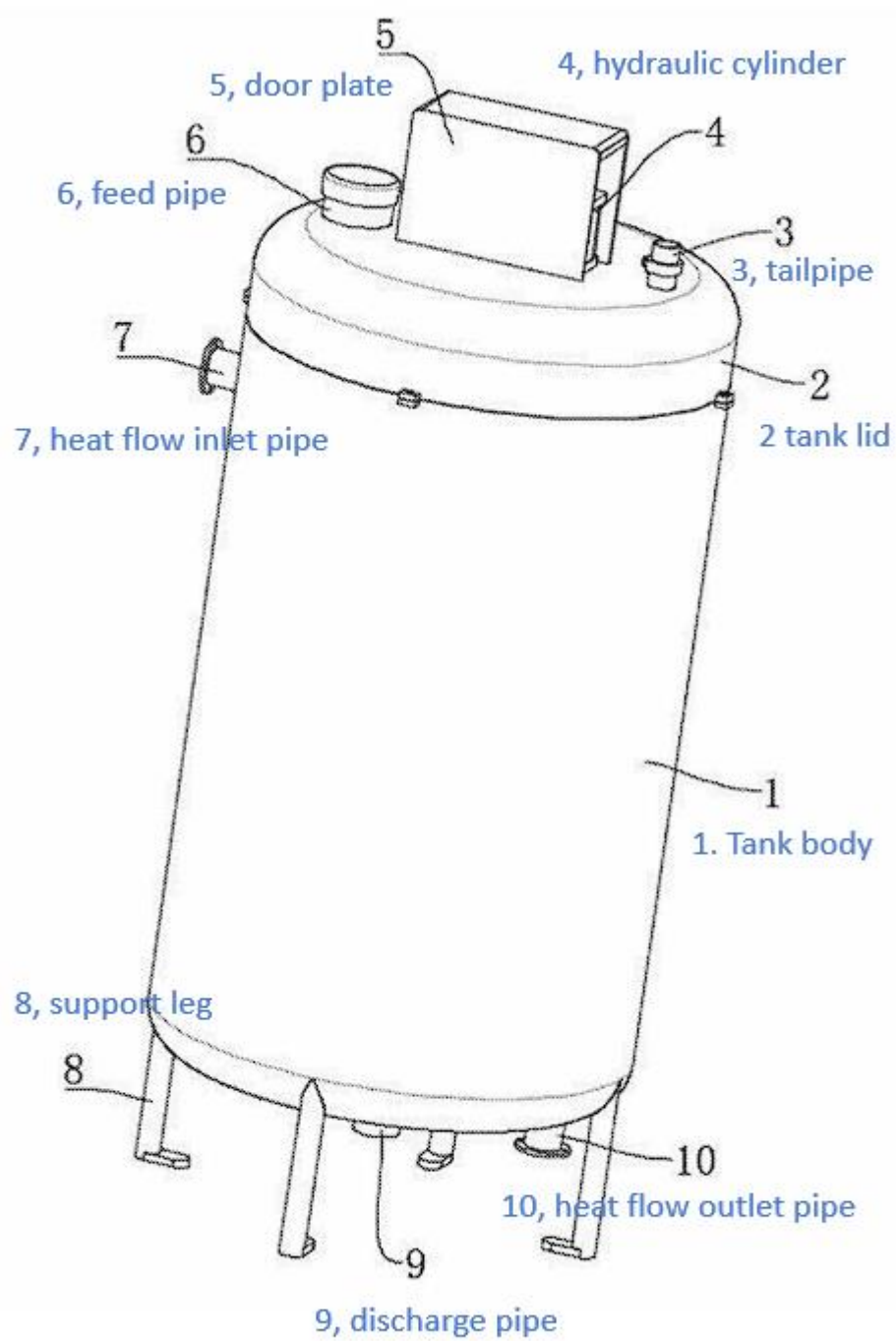
In the past two days, I have looked up the patents of Gaotong related equipment and reviewed them. In the next two days, I will consult and study the patents of Adanas.

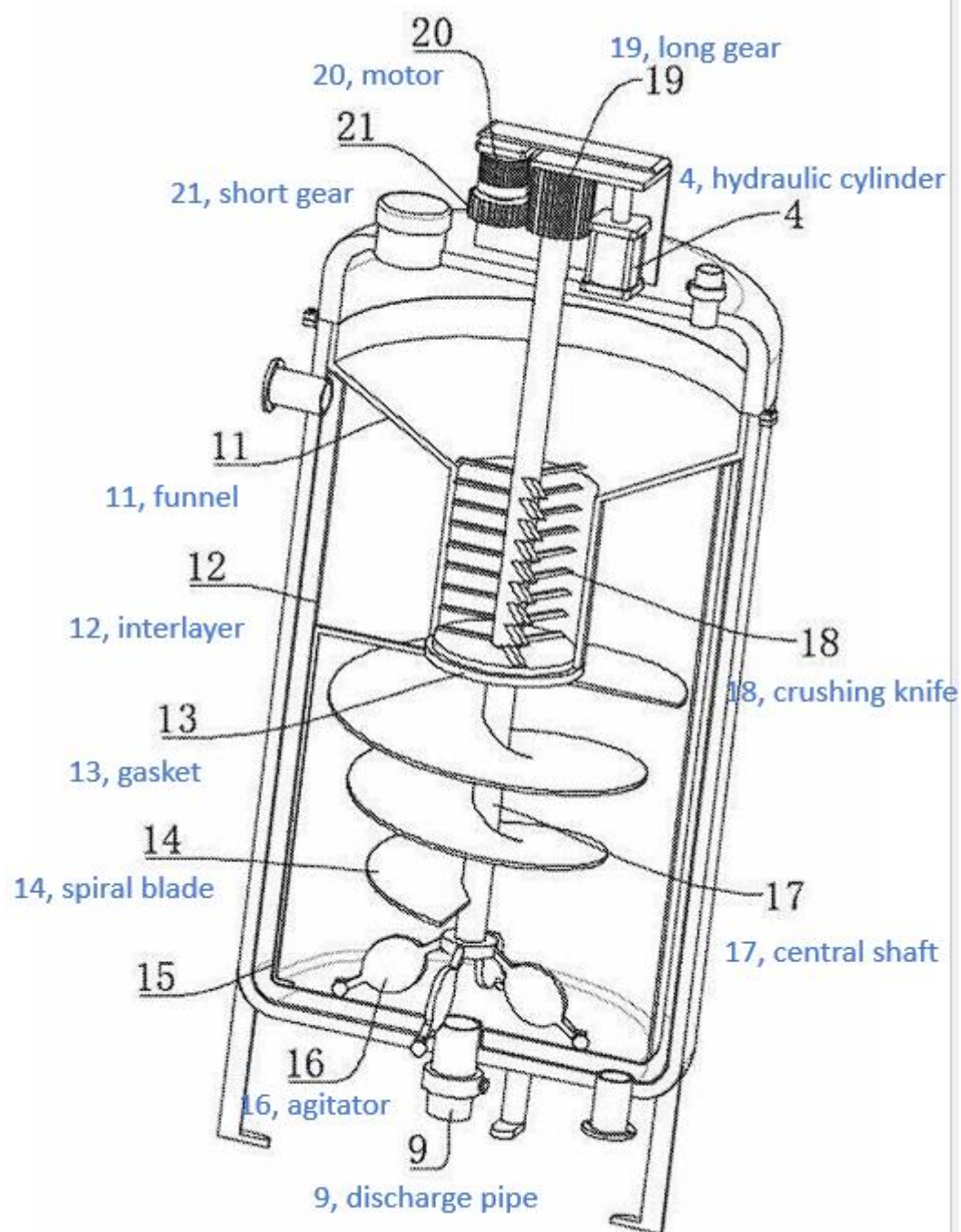
A solvent pretreatment tank

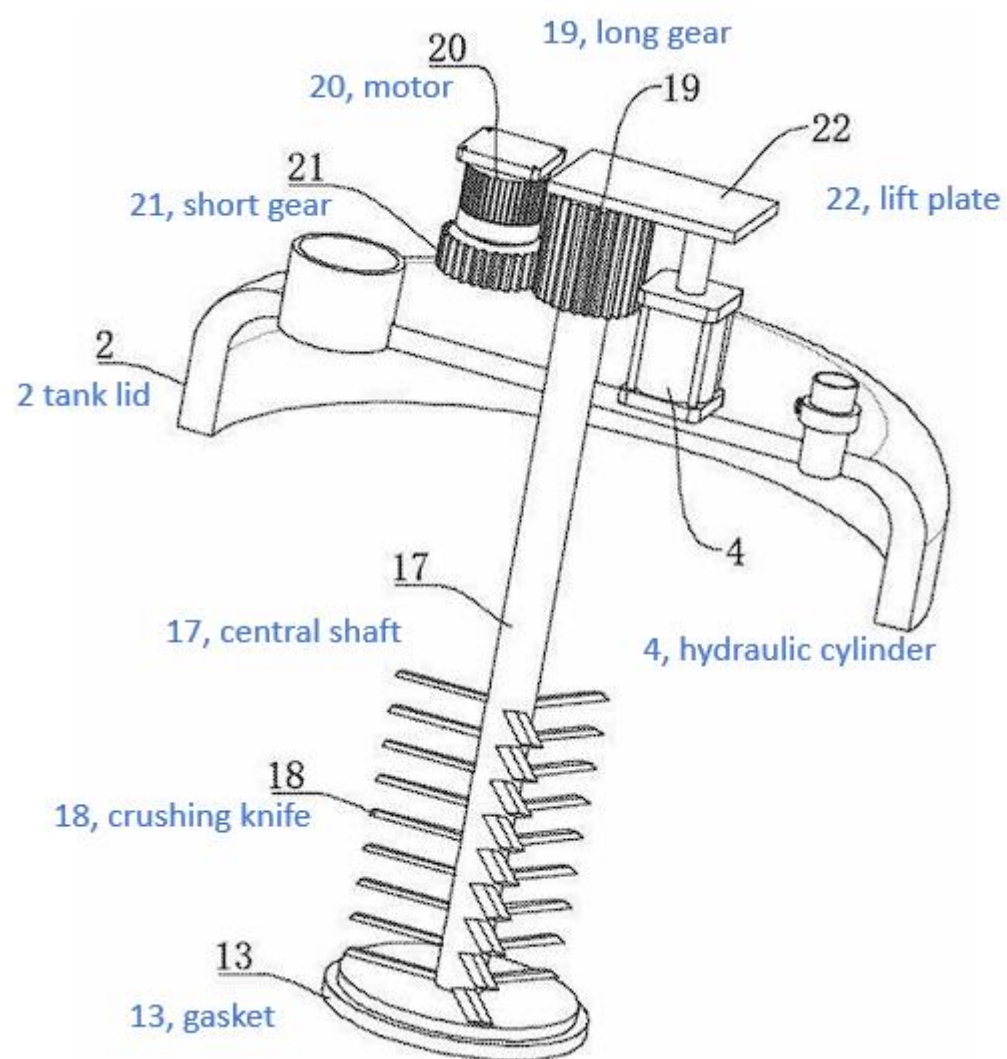
(CN 220443568 U)

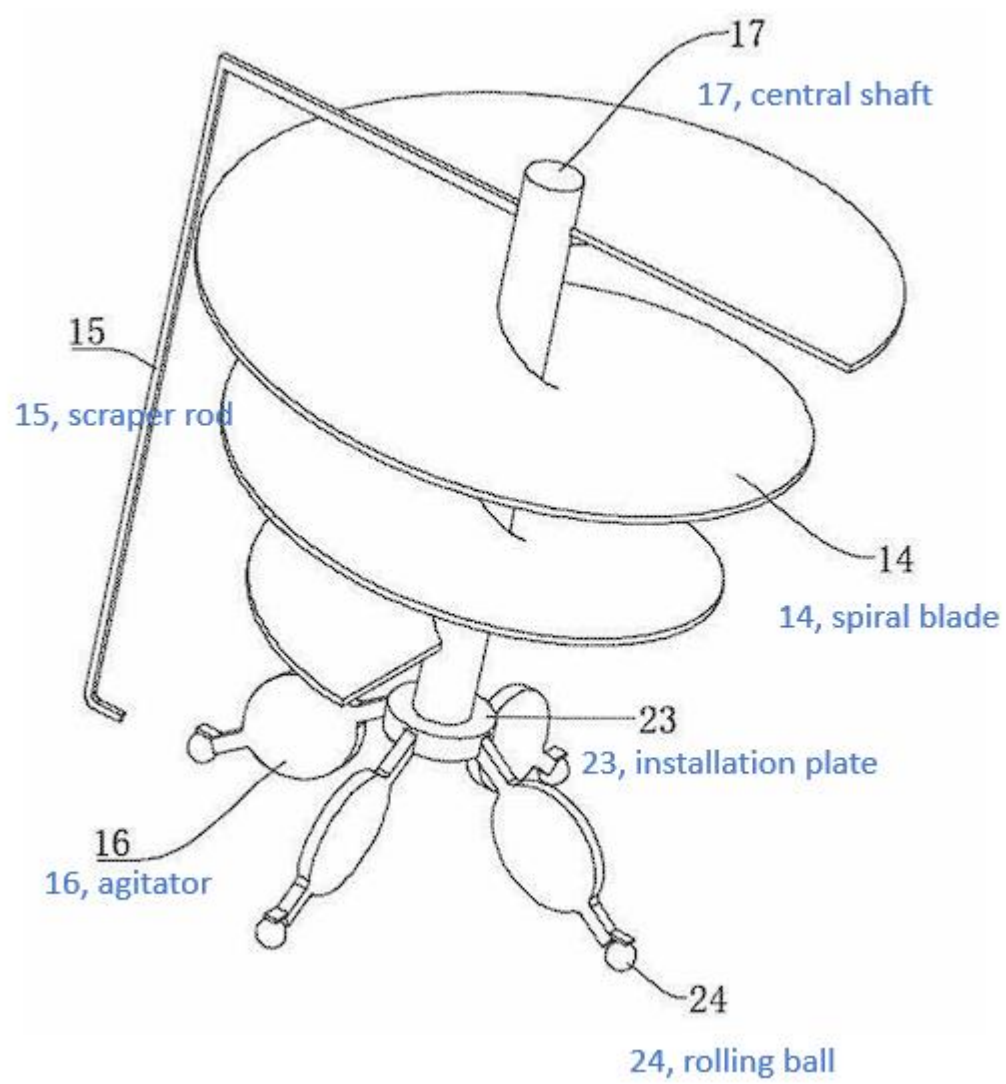
Sucrose ester, also known as sucrose fatty acid ester, is a non-toxic, biodegradable, good surface activity of Nonionic surfactant, has a wide range of applications. Sucrose ester can be used as emulsifier, foaming agent, viscosity regulator, lubricating gloss agent, anti-aging agent, wetting and dispersing agent, antibacterial agent in food industry, detergent and cosmetics in daily chemical industry, and Solubilizer, dispersant, penetrating agent, emulsifier, coating agent, disintegrating agent in pharmaceutical industry. Up to now, there are various methods for the synthesis of sucrose esters, such as solvent method, solvent-free method, micro emulsification method and phase transfer catalysis method. The first batch of products in the field of Yishan (raw) hemp base H agent synthesized by consultation method mainly used dimethylformamide or dimethyl irony as solvent and potassium carbonate as catalyst to esterify sucrose with fatty acid esters to form sucrose esters. At present, the pre-mixing operation is needed in the synthesis of sucrose fatty acid ester by solvent method. because most of the catalysts and sucrose in the raw materials are crystal, there is no good crushing structure inside the treatment tank during the mixing treatment. at this time, it takes a certain amount of time to complete the mixing operation, which reduces the pretreatment efficiency and prolongs the pretreatment time. There is an urgent need to design a solvent pretreatment tank to solve the above problems.

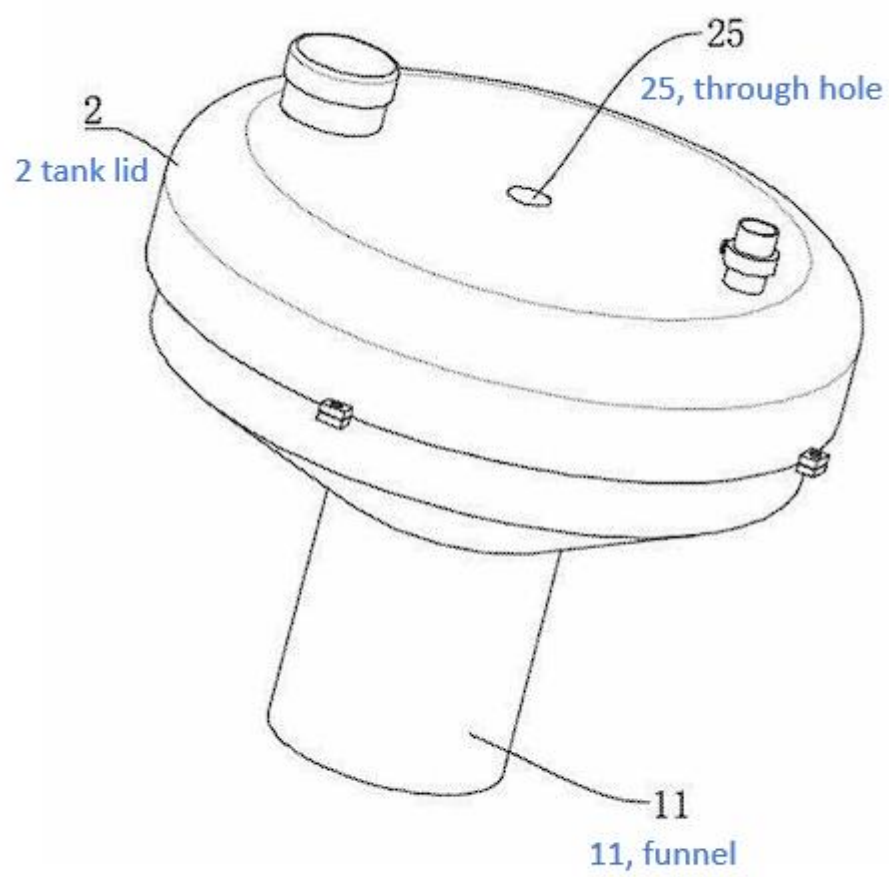
The device is a solvent pretreatment tank, which includes a tank body. The top of the circumferential inner wall of the tank body is fixedly equipped with a funnel, and the top of the tank body is fixedly equipped with a tank cover, the middle position of the tank cover is provided with a through hole, and the inner wall of the through hole is inserted with a central shaft. The top of the central shaft is provided with a lifting assembly, and the top of the outer wall of the central shaft is provided with a rotating mechanism. The outer wall of the central shaft is fixed with a crushing knife with a circular distribution at an equal distance. The utility model forms a crushing structure of the raw material, on the one hand, the raw material can be fully crushed through the crushing process, so that the raw material can be premixed in the funnel, on the other hand, the subsequent mixing time is short, and the pretreatment efficiency is improved. and the mixed liquid is stirred by the spiral blade and the stirring assembly. The heat conduction module is used to heat the inside of the tank to improve the effect of raw material pre-mixing in the synthesis of sucrose fatty acid ester.









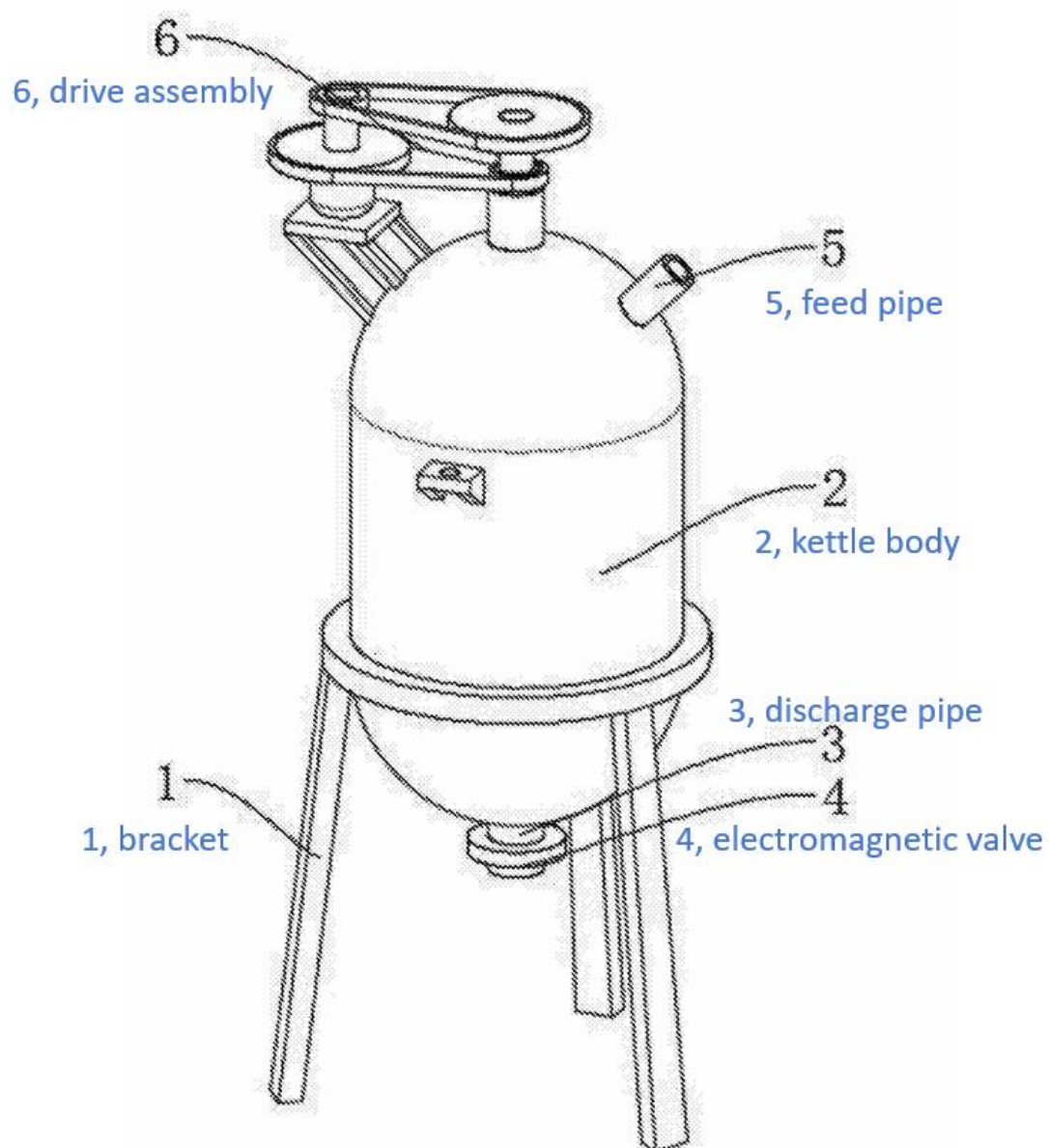


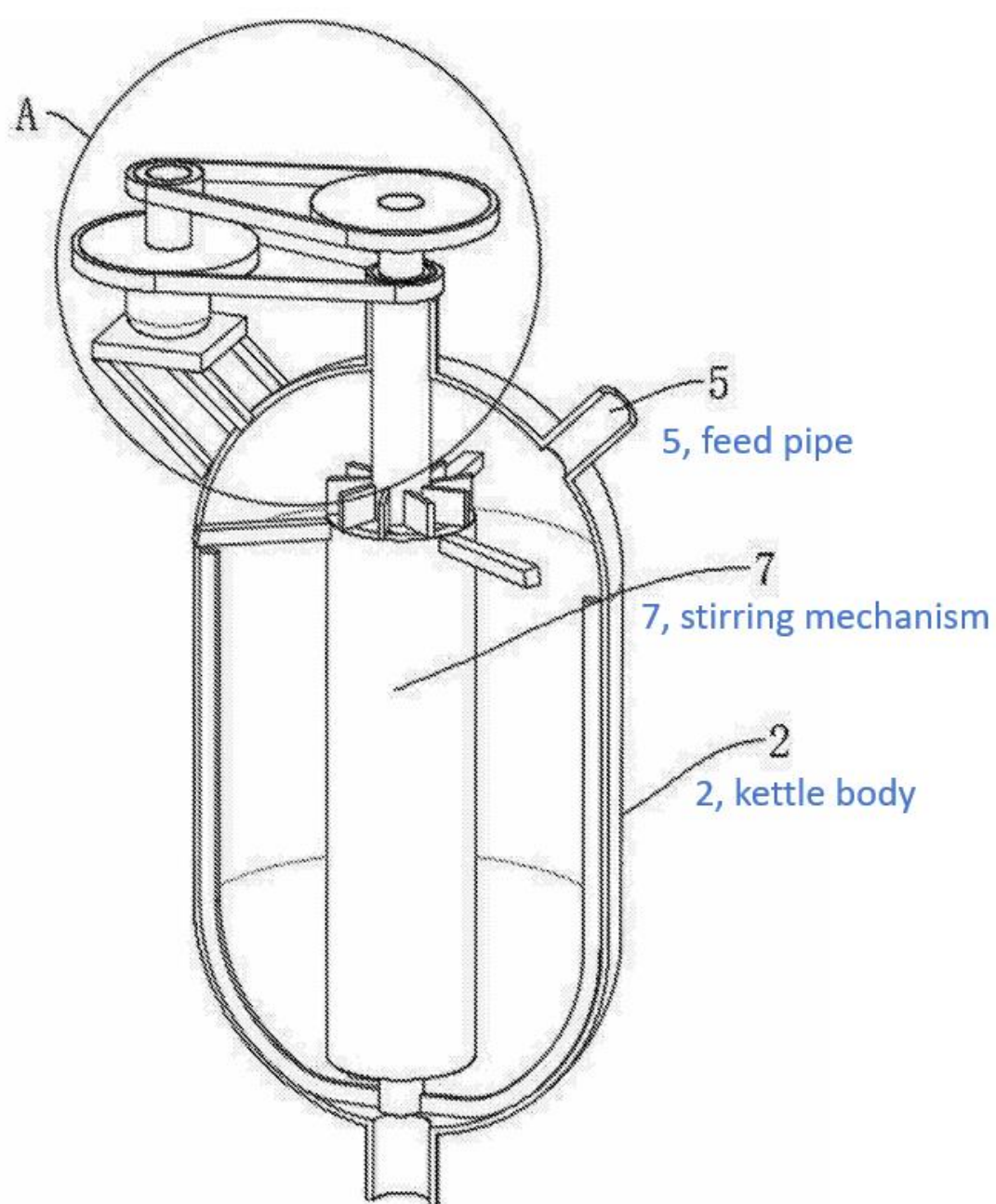
A reactor for synthesis of sucrose butter ester

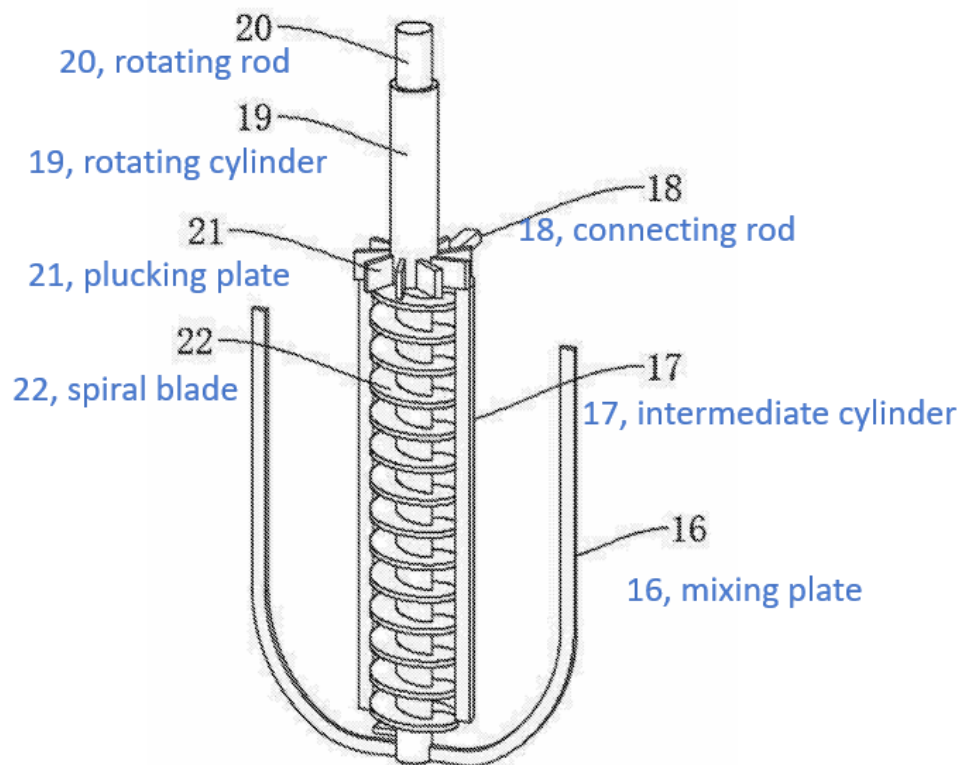
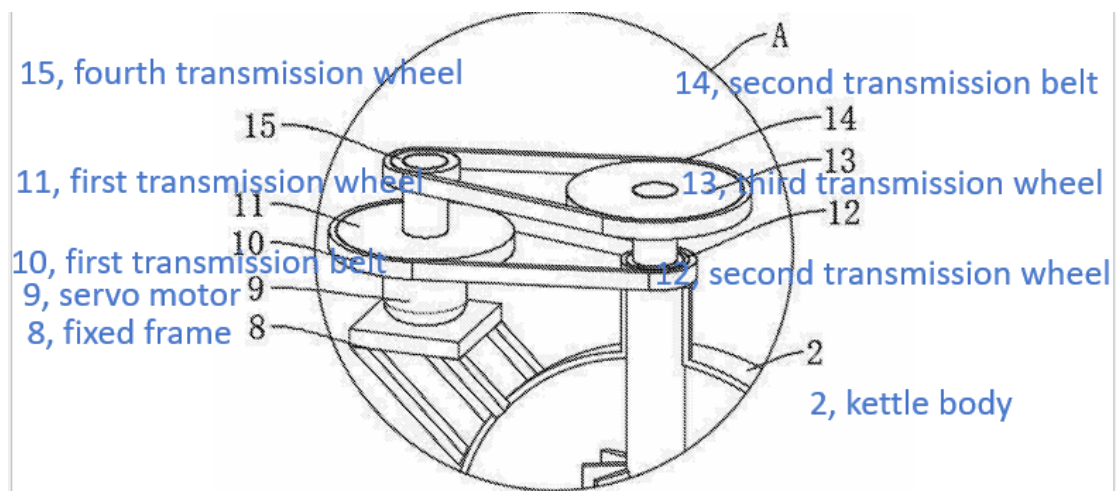
(CN 220443838 U)

Sucrose oil ester is the condensation product of sucrose and oleic acid, which has a wide range of applications because of its rich raw material resources, harmless to human body, non-irritation of skin and mucous membrane, non-toxicity and so on. The product has good emulsification, dispersion, wetting, decontamination, foaming, viscosity regulation, anti-aging, anti-crystallization and other functions, and has been used in food emulsifier, fruit ant staling agent and so on. There are many methods for the synthesis of sucrose esters, including transesterification, micro emulsification, water solvent, melting, cabinet dissolving and so on.

The raw materials of sucrose oil esters are generally mixed in a reactor, and the stirring mechanism in the reactor generally adopts a uniaxial stirring structure (composed of a rotating rod and several stirring plates fixed on the rotating rod), and the raw materials are easy to deposit at the bottom. The materials in the reactor will still be delaminated up and down, resulting in uneven material mixing. The device is a reaction kettle, comprising a kettle body and a driving assembly. The driving assembly is arranged on the outside of the kettle body and the stirring mechanism. The stirring mechanism comprises a rotating cylinder, a rotating rod, a spiral blade, an intermediate cylinder, a plurality of connecting rods and a plurality of mixing plates. The top of the kettle body is provided with a rotating hole at the position of the central axis. The rotating cylinder is installed in the rotating hole through the rotation of the bearing. The rotating rod is installed in the rotating cylinder through the rotation of the bearing. The spiral blade is coaxially fixed with the rotating rod. The raw materials in the device can circulate up and down in the kettle body, so as to prevent the problem of upper and lower delamination due to deposition, thereby improving the mixing efficiency. By setting a moving plate, the moving plate spreads the materials transported to the top, thus expanding the contact area with materials and materials, and further improving the stirring efficiency.







A mixing mechanism of trough mixer

(CN 220514023 U)

Sucrose Laurate is a colorless to yellowish thick gel, soft solid or white to yellowish brown powder, depending on the type of fatty acid and the degree of esterification. Sucrose Laurate was obtained by esterification of sucrose, methyl stearate, sodium stearate and anhydrous sodium carbonate at 130 °C to 150 °C, then distillation of propylene glycol at 120 °C, cooling and crushing, dissolving in methyl ethyl ketone to remove insoluble matter.

The basic raw materials of sucrose Laurate (propylene glycol as solvent, sucrose, methyl stearate, sodium stearate and anhydrous sodium carbonate) need to be mixed before the next esterification can be carried out. The mixing equipment commonly used is the tank mixer. The mixing mechanism of the tank mixer mainly plays the role of mixing, which can make the materials mix more fully and play an important role in material mixing. Therefore, people have higher and higher requirements for mixing institutions.

The structure of the mixing mechanism of the existing tank mixer is relatively simple. Generally, the mixing mechanism is composed of a rotating rod and an upper mixing blade with a rotating rod. If the stirred material contains caking (some materials absorb moisture), the mixing quality will be reduced.

The device is a mixing mechanism of a trough mixer, which comprises a mixing tank box, which comprises a supporting mechanism (the supporting mechanism is arranged on the outside of the mixing tank box), a mixing mechanism (the mixing mechanism includes a driving assembly, a rotating rod, an intermediate cylinder, an intermediate spiral blade and a variable diameter spiral blade). The inner walls of both ends of the mixing tank box are provided with rotating holes. The two ends of the rotating rod are rotated and installed in the two rotating holes. One end of the middle cylinder is fixed with a plurality of connecting rods, and one end of the connecting rod is fixed in the mixing trough box. The cylinder is coaxially arranged with the rotating rod. The device can not only stir the material, but also make the material extruded and broken, so as to improve the mixing degree. because of the opposite rotation direction of the external spiral blade and the middle spiral blade, the material can circulate in the box. convection mixing occurs at the same time to further improve the mixing degree.

