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Development and Application of an Ultrasonic Atomizer for Enhancing the Efficacy of Tibetan Medicines in Treating Eye Diseases

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Abstract: Following the establishment of the People's Republic of China and the subsequent reforms, the Tibet Autonomous Region has experienced significant advancements in various domains such as culture, art, painting, medicine, and science and technology. These advancements have been largely supported by state policies, technological progress, and local efforts. According to 2019 statistics, China currently has approximately 17.31 million individuals who are blind. The number of individuals with visual impairments is three times higher, totaling over 50 million, with 30 million suffering from low vision. Consequently, the development of drugs and instruments for treating eye diseases is critically important for these patients.Our team has developed a Tibetan medicine-based treatment that has shown promising results and holds medical value. However, there is an urgent need for a complementary instrument to enhance its effectiveness. This highlights the necessity for the research and development of an ultrasonic atomizer. Such a device aims to provide a novel, effective, and affordable treatment option for patients with eye diseases. By leveraging our unique Tibetan medicinal techniques, we hope that the development of this ultrasonic atomizer will significantly amplify the therapeutic effects of the medicine, offering a new viable treatment for a broader patient population.

Keywords: Ultrasonic Atomizer, Tibetan Medicine, Treatment of eye diseases, Easy to operate.

1. Particularity of Ultrasonic Atomizer

1.1. Development Prospect and Significance

In recent years, health has become a hot topic of the whole society, eye mask, eye drops, eye massage instrument and other related products for eye healthy problems have also become the focus of people's attention. In fact, in addition to these products that have been classified and entered the market to relieve eye fatigue and treat eye diseases, there is also a product that has been mass produced in the market, but has not been used to treat eye diseases, that is, the product we focus on today, the atomizer. So this is a blank market waiting for us to develop it. In recent years, various domestic and foreign medical equipment brands have made a variety of targeted atomizers, for example, for the treatment of various upper and lower respiratory diseases, such as cold, fever, cough, asthma, sore throat, pharyngitis, rhinitis, bronchitis, pneumoconiosis and other diseases in the trachea, bronchus, alveoli, and chest. Now the aerosol inhalation treatment we have mastered is very mature. It is a very important and effective treatment method in the treatment of respiratory diseases. Through the use of the aerosol inhaler to atomize the liquid medicine into small particles, the medicine enters the respiratory tract and lungs through the way of breath inhalation, so as to achieve the goal of painless, rapid and effective treatment. As early as the first medical atomizer was

launched in 1978, after the development of these years, from the initial steam atomizer to the later ultrasonic inhaler, compression atomizer and mesh atomizer; from the initial single atomizer product to the later developed oxygen generator and atomizer, we have a complete product line in the field. The rapid development of medical atomizer from its appearance, mass production to shows its powerful effect on medical treatment now, and its promising future is obvious to all of us. However, the role of medical atomizer in the treatment of eye diseases has not been developed. In addition, what we have now, the Tibetan medicine for Eye diseases that atomization will produce better. Therefore, it is hanging over our hea to improve the existing atomizer so that an ultrasound atomizer which can treat eye diseases can appear in the market.

The main function of the atomizer is to atomize the medicine into tiny drops, which can be fully contacted with the injured part to achieve the therapeutic effect. In this way, the waste of drugs is reduced, the curative effect of drugs is brought into full play, the pain of taking drugs is reduced, and no harm is caused to human body. The atomizer also has the function of humidifying air and preventing skin dryness, but we mainly describe the medical function of the atomizer at this moment. From a medical point of view, atomizers are commonly circulating in the market have the functions of diminishing inflammation, relieving cough, eliminating phlegm, relieving bronchospasm, smoothing airway and improving ventilation function, so the patients do not feel dyspnea. At the same time, it can also prevent respiratory tract infection after thoracic surgery, resulting in good results. It can also be used in conjunction with artificial respiration for respiratory tract humidification or intermittent atomization of related drugs. Most importantly, it can also be used to treat lung cancer with anti-cancer drugs. From the perspective of the function of atomizer, the prospect of atomizer is very excellent. Now in some developed countries, household atomizer has become a necessary product for every family. At home, the atomizer is also loved by Chinese people, which shows that the prospect of atomizer is optimistic.

1.2. Control Principle

This ophthalmic ultrasonic atomizer designed by us is different from the atomizer in the market that can achieve the therapeutic effect by inhaling drugs. The power supply and working circuit of the atomizer are separately installed in an engineering plastic shell. When the input of the device is inserted into the power supply, the output will supply power to the atomizer head through the wire. It can separate drugs from water, connecting the drugs to the eye mask through a tube, and then apply the eye mask to the eyes to achieve the effect of relieving ocular fatigue and even treating ocular diseases.

2. The Role of Tibetan Medicine

2.1. Particularity

Tibet is a place very close to the sun. And Tibetan medicine have magical curative effect, the main reason lies in Tibet's unique high altitude on the earth, which makes Tibetan medicine have extraordinary vitality. The snow-covered medicine grown in the alpine and anoxic zone is not only pure and pollution-free, but also has excellent drug effect. At the same time, due to special geological reasons, these medical plants contain essential metal trace elements. These rich sources of mineral drugs are like a treasure, which is in line with the needs of people in non-plateau areas. This makes Tibetan medicine have such magical curative effects. The Tibetan medicine added into our ultrasonic atomizer has a large number of clinical evidences proving that the Tibetan medicine we use have better curative effect than common drugs.

2.2. Working Principle and Performance Analysis

The liquid medicine is atomized by using the ultrasonic principle. The atomizer of the ultrasonic atomizer has no selectivity to the mist particles, so the generated drug particles can transmit Tibetan medicine to the eyes through pipelines. At the same time, due to the large mist particles generated by the ultrasonic atomizer and fast atomization, the patient can fully contact with the Tibetan medicine to moisten the eyes. The ultrasonic atomization is used as a carrier to carry out eye

treatment. A proper amount of Tibetan medicine juice is decocted according to the traditional method, poured into the medicine cup of the ultrasonic atomizer, switched on for 5 to 10 minutes, and the eyepatch connected to the atomizer pipeline is applied to the eyes, which can be applied 1 to 3 times a day.

Through this instrument, the use of drugs can be properly done without causing waste. Through airflow induction or keys, the battery is operated, and then the atomizer is connected to generate heat and atomization effect, thus achieving the function of treating eye diseases.

3. Innovation and Application

Compared with the ordinary atomizer, our atomizer has the following innovations:

(1) Different from the breathing atomizer in circulation on the market, the ultrasonic atomizer we use is more efficient in the use of drugs.

(2) The Tibetan medicine adopted has better therapeutic effect than common drugs, shortens the treatment period and brings convenience to the life of patients.

(3) Our method is more gentle, stable, durable, non-irritating, mild, easy to control temperature, and isn't easy to burn. It can be widely applied to the market.

(4) The utility model has the advantages of more convenient operation, large room for movement, and can be used for sitting and lying down, and the atomizing component is light and convenient to wear.

In practical application, in addition to the treatment of patients with eye diseases, our atomizer can also achieve the effect of other medical atomizers. When the pipe connecting the eyes is pulled out, it can become a household atomizer used to moisten the air, purify the environment, moisten the skin, and beautify the face. It can release a large number of negative oxygen ions in the process of atomization, effectively increase indoor humidity, moisten dry air, combine with the floating smoke and dust in the air to make it precipitate, effectively remove the smell of paint, mildew, smoke and odor, make the air more fresh, protect people's health, create the oxygen bar with fog, moisten the skin, promote the blood circulation and metabolism of facial cells It can relieve nervous tension, eliminate fatigue and make people glow.

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