OPHTHALMIC EYE NERVE MASSAGE DEVICE

Field of the Invention

The present invention relates to the technical field of massage devices, and specifically to an ophthalmic eye nerve massage device.

Background to the Invention

The growing market demand and enhanced health awareness, along with the increasing use of digital devices and prolonged screen time, have led to the increasing prevalence of eye problems including eye fatigue, dryness, blurred vision, and myopia. According to the *Workplace Eye Usage Survey* jointly released by institutions including *Health Times*, a staggering 93.67% of workplace employees suffer from visual fatigue symptoms due to prolonged and excessive eye strain. This highlights the severity of eye health issues and has driven the research and development of ophthalmic eye nerve massage devices.

In recent years, people have paid growing attention to health and self-care, and the focus on eye health has also increased accordingly. As tools for relieving eye fatigue and improving eye blood circulation, eye nerve massage devices conform to modern people's pursuit of a healthy lifestyle.

Upon searching, Chinese Patent No. CN215022181U proposes an ophthalmic massage device for neurological treatment of facial paralysis, which relates to neurology treatment instruments. It solves the problem that the traditional manual massage method for the eyes of facial paralysis patients is not only labor-intensive but also fails to achieve uniform force application, which is unfavorable for the treatment of the eyes of facial paralysis patients. Its technical solution is as follows: it includes a first eye mask, a second eye mask, a heating mechanism, a main controller, control buttons, and a massage mechanism. The main controller is electrically connected to the control buttons; the first eye mask and the second eye mask are arranged at an interval, a connecting plate is jointly installed between the ends of the first eye mask and the second eye mask that are close to each other, and

an elastic strap is jointly installed between the ends of the first eye mask and the second eye mask that are far from the connecting plate. This achieves a relatively uniform massage effect on the eyes of facial paralysis patients, and the auxiliary heat therapy during massage helps effectively relax the patients' eye nerves, which is beneficial for the treatment of the eyes of facial paralysis patients.

Although the above-mentioned device may realize ophthalmic massage for patients, it massages by driving rotating balls to rotate via a motor, so the massage method is relatively monotonous, and the massage effect is not good enough. In addition, most ophthalmic massage devices completely cover both eyes, making it impossible to open the eyes after wearing them and thus unable to observe the external environment normally. However, ophthalmic diseases are complex and varied; some patients have symptoms in one eye while the other eye is normal, and the normal eye may not open normally after wearing the device. The massage contacts are directly exposed without a protective structure for the eyes; if the patient accidentally moves the device during use, the massage contacts will directly touch the patient's eyes, causing damage to the patient's eyes. It is connected in a strap style, and during wearing, it needs to be fixed by strapping around the head; the constraining force directly affects the wearing comfort of the patient.

Statement of Invention

In view of the above-existing problems, the present invention aims to provide an ophthalmic eye nerve massage device, which may arrange the zoning of the massage structure and the eye to further protect the patient's eyes; arrange different wearing modes to improve the patient's comfort on the premise of ensuring its stability; arrange multi-angle massage for the massage structure to improve comfort and massage effect; and arrange a detachable structure to improve the applicability of the massage structure.

The main idea of the technical solutions adopted by the present invention is that: by designing a glasses-type overall structure, left and right sides are detachably connected through a middle connecting rod, so that the patient may use unilateral massage or bilateral massage as needed; annular double-layer diaphragms are arranged at the eyes,

and massage modules are arranged between the double-layer diaphragms, which are separated from the patient's eyes through the inner diaphragms; the massage modules may realize twisting and pressing to enhance the massage treatment effect; air pressure connection modules are arranged in support frames on two sides of the massage device, and airbags I are arranged in the support frames, and gas is made to enter the airbags II by pushing control rods to improve the stability of the massage device; nebulizers are arranged on eye covering shells, and the liquid medicine is released through small holes on the diaphragms, so that the liquid medicine may be better absorbed while performing massage treatment.

To achieve the above objective, the technical solutions adopted by the present invention are as follows.

An ophthalmic eye nerve massage device includes: a massage frame, the massage frame including interconnected support frames and eye covering shells, symmetrically arranged in two groups, where the eye covering shells are detachably connected via a connecting rod;

massage modules, arranged inside the eye covering shells; and

air pressure connection modules, arranged on the support frames.

Through the above technical solutions, further: double-layer diaphragms are arranged inside the eye covering shells, and the massage modules are arranged between the double-layer diaphragms.

Through the above technical solutions, further: the massage modules include driving ends arranged on inner walls of the eye covering shells. The driving ends are connected to massage heads and containing shells, and the massage heads extend out of the containing shells.

Through the above technical solutions, further: the driving ends include electromagnetic plates arranged on the inner walls of the eye covering shells, the electromagnetic plates are connected to magnetic plates via springs I, the magnetic plates are connected to massage rods, and the massage heads are connected to the massage rods.

Through the above technical solutions, further: the electromagnetic plates are fixedly connected to limiting rods, and the springs I are sleeved on the limiting rods.

Through the above technical solutions, further: the air pressure connection modules include fixed blocks arranged on the support frames, control rods are slidably connected in the fixed blocks, sliding plates are slidably connected in the support frames, and the control rods are fixedly connected to the sliding plates.

Through the above technical solutions, further: airbags I are arranged at ends of the sliding plates away from the eye covering shells, airbags II are arranged inside the support frames, and the airbags I are connected to the airbags II via vent pipes.

Through the above technical solutions, further: liquid medicine storage tanks are arranged on the support frames, pushing plates are slidably connected in the liquid medicine storage tanks, ends of the pushing plates away from the eye covering shells are fixedly connected to pushing rods, and the pushing rods are connected to the control rods.

Through the above technical solutions, further: springs II are sleeved on the pushing rods, ends of the springs II are fixedly connected to outer walls of the liquid medicine storage tanks, and other ends are fixedly connected to the control rods.

Through the above technical solutions, further: small holes are disposed on the outer diaphragms of the eye covering shells, and the small holes are in communication with the liquid medicine storage tanks.

The present invention has the following advantages.

1. By designing a glasses-type overall structure, left and right sides are detachably connected through the middle connecting rod, so that the patient may use unilateral massage or bilateral massage as needed.

2. Annular double-layer diaphragms are arranged at the eyes, and the massage modules are arranged between the double-layer diaphragms, which are separated from the patient's eyes through the inner diaphragms.

3. The massage modules may realize twisting and pressing to enhance the massage treatment effect; the air pressure connection modules are arranged in the support frames

on both sides of the massage device, and airbags I are arranged in the support frames, and gas is made to enter the airbags II by pushing the control rods to improve the stability of the massage device.

4. Nebulizers are arranged on the eye covering shells, and the liquid medicine is released through the small holes on the diaphragms, so that the liquid medicine may be better absorbed while performing massage treatment.

Brief Description of the Drawings

FIG. 1 is a schematic perspective view of the present invention;

FIG. 2 is a schematic perspective view of a disassembly state of the present invention;

FIG. 3 is a schematic perspective view of another angle of the present invention;

FIG. 4 is an enlarged schematic view of part of the structure in FIG. 3;

FIG. 5 is an enlarged schematic view of part of the structure in FIG. 4;

FIG. 6 is a schematic perspective view of a massage module of the present invention with a containing shell removed;

FIG. 7 is a schematic perspective view of a connection relationship of an air pressure connection module of the present invention;

FIG. 8 is an enlarged schematic view of part of the structure in FIG. 7;

FIG. 9 is a schematic side perspective view of the present invention;

FIG. 10 is a schematic perspective view of a connection relationship of a pushing rod of the present invention;

FIG. 11 is a schematic top view of the present invention;

FIG. 12 is a sectional view along A-A in FIG. 11;

FIG. 13 is an enlarged schematic view of part of the structure in FIG. 12;

FIG. 14 is a sectional view along B-B in FIG. 11; and

FIG. 15 is an enlarged schematic view of part of the structure in FIG. 14;

Reference numerals and denotations thereof: 1-support frame;

2-eye covering shell; 201-charging interface; 202-diaphragm; 203-small hole;

3-connecting rod; 301-nose pad;

4-massage module; 401-electromagnetic plate; 402-limiting rod; 403-spring I; 404-magnetic plate; 405-massage rod; 406-massage head; 407-containing shell;

5-air pressure connection module; 501-liquid medicine storage tank; 501-1-liquid medicine injection port; 501-2-pushing plate; 501-3-pushing rod; 501-4-spring II; 502-fixed block; 502-1-sliding groove; 502-2-movable groove; 503-control rod; 503-1-limiting block; 504-sliding plate; 505-airbag I; 506-vent pipe;

6-connecting pipe;

7-nebulizer; and

8-airbag II.

Detailed Description

To make the objectives, technical solutions and advantages of the examples of the present invention clearer, the technical solutions in the examples of the present invention will be clearly and completely described below in conjunction with the accompanying figures in the examples of the present invention. Obviously, the described examples are part of the examples of the present invention, not all of the examples. The components of the examples of the present invention described and shown in the figures here may generally be arranged and designed in various configurations.

The inventor finds that although existing devices may realize massage on the patient's eyes, they drive rotating balls to rotate for massage through motors, resulting in a monotonous massage mode and poor massage effect. In addition, most eye massage devices completely block both eyes, so that the eyes may not be opened after wearing, and normal observation of the outside world may not be performed. However, ophthalmic

diseases are complex and variable, and some patients have symptoms in one eye while the other eye is normal, so that the normal eye may not be opened normally after wearing; massage contacts are directly exposed, and no protective structure for the eyes is provided. If the patient moves accidentally during use, the massage contacts will directly contact the patient's eyes, causing damage to the patient's eyes.

Based on the above findings, the present invention provides an ophthalmic eye nerve massage device. By designing a glasses-type overall structure, left and right sides are detachably connected through a middle connecting rod, so that the patient may use unilateral massage or bilateral massage as needed; annular double-layer diaphragms are arranged at the eyes, and massage modules are arranged between the double-layer diaphragms, which are separated from the patient's eyes through the inner diaphragms; the massage modules may realize twisting and pressing to enhance the massage treatment effect; air pressure connection modules are arranged in support frames on two sides of the massage device, and airbags I are arranged in the support frames, and gas is made to enter airbags II by pushing control rods to improve the stability of the massage device; nebulizers are arranged on the eye covering shells, and the liquid medicine is released through small holes on the diaphragms, so that the liquid medicine may be better absorbed while performing massage treatment.

Example 1

Referring to FIGS. 1-3, the present invention provides an ophthalmic eye nerve massage device, including a symmetrically arranged massage frame, which is similar in shape to glasses. A single side includes an interconnected support frame 1 and an eye covering shell 2, and the eye covering shells 2 on two sides are detachably connected via a connecting rod 3. When a patient needs unilateral eye massage, the connecting rod 3 and the eye covering shell 2 on the other side may be removed, so that the eye that does not need massage may normally observe the external environment.

A charging interface 201 is disposed at the end of the eye covering shells 2 close to each other, which may be connected for charging via a power cord. The connecting rod 3 is connected to the eye covering shells 2 through the charging interface 201, and the internal

structure of the charging interface 201 adopts the existing mobile phone charging interface 201 style. The connecting rod 3 does not have an electrical connection function, but connecting parts at its two ends are consistent in structure with the joint of a charging cord, so that the connecting rod 3 is stably connected to the charging interface 201 without easily falling off; during disassembly, it may be directly pulled out. Rechargeable batteries are further arranged on the eye covering shells 2, which are arranged near the charging interface 201. After charging is completed, the batteries supply power to other electrical structures.

In order to fix the massage device on the patient's face, a nose pad 301 is arranged on the connecting rod 3. The patient may place the nose pad 301 on the bridge of the nose, and the support frames 1 on two sides are placed on the ears on two sides of the patient, which is consistent with the conventional glasses wearing method, and may maintain stable position without easily falling off.

Example 2

Referring to FIGS. 4-6, two layers of annular diaphragms 202 are arranged inside each eye covering shell 2, forming a massage therapy zone through isolation, and a plurality of massage modules 4 are arranged in the massage therapy zone for massaging eye acupoints.

The massage modules 4 include driving ends arranged on inner walls of the eye covering shells 2, where electromagnetic plates 401 are arranged on the inner walls of the eye covering shells 2, the electromagnetic plates 401 are connected to magnetic plates 404 via springs I 403, the electromagnetic plates 401 are fixedly connected to limiting rods 402, the springs I 403 are sleeved on the limiting rods 402, and the limiting rods 402 have no connection relationship with the magnetic plates 404. Using the principle of electromagnetic adsorption, in the initial state, the electromagnetic plates 401 are not energized and have no magnetism; when the electromagnetic plates 401 are energized, their magnetism is opposite to that of the magnetic plates 404, so the magnetic plates 404 are attracted to the electromagnetic plates 401, and the springs I 403 contract; when the power is off, the magnetism disappears, and the springs elongate under the action of

elastic force.

“C”-shaped massage rods 405 are fixedly connected to the magnetic plates 404, two ends of the massage rods 405 are fixedly connected to hemispherical massage heads 406, containing shells 407 are arranged on the massage heads 406, and the massage rods 405 and the driving ends arranged on the inner walls of the eye covering shells 2 are placed in the containing shells 407, to avoid damage to the patient’s eyes caused by springs, electromagnetic plates 401, etc., and improve comfort. The massage heads 406 extend out of the containing shells 407.

A controller is arranged, and by controlling the magnetic intensity, energization time, and interval time of the electromagnetic plates 401, the massage time, massage intensity, and massage interval of different acupoints may be controlled simultaneously. Here, a plurality of electromagnetic plates 401 are numbered, and corresponding programs are respectively designed for program control to correspond to different diseases and different patients, to perform massage with massage intensity acceptable to patients.

The springs I 403 are composite torsion coil springs, which utilize the advantage of the spring system of composite torsion coil springs that may generate horizontal torsion effect while bearing tensile or compressive loads, so that twisting and pressing may be performed while performing up-and-down telescopic pressing massage, to enhance the massage treatment effect.

When the electromagnetic plates 401 are energized, their magnetism is opposite to that of the magnetic plates 404, the magnetic plates 404 are attracted to the electromagnetic plates 401, the springs I 403 contract, driving the massage heads 406 and the containing shells 407 to twist and contract inward; when the power is off, the magnetism disappears, the springs elongate under the action of elastic force, and the massage heads 406 and the containing shells 407 twist and extend outward.

Example 3

Referring to FIGS. 1-15, air pressure connection modules 5 are further arranged on the support frames 1, airbags I 505 are arranged in the support frames 1, and gas is made to enter airbags II 8 by pushing control rods 503 to improve the stability of the massage

device; nebulizers 7 are arranged on the eye covering shells 2, and liquid medicine is released through small holes 203 on the diaphragms 202, so that the liquid medicine may be better absorbed while performing massage treatment.

Liquid medicine storage tanks 501 are arranged on the support frames 1, the liquid medicine storage tanks 501 are arranged at ends of the support frames 1 close to the eye covering shells 2, and are arranged in C-shaped structures, wrapped on the support frames 1 and fixedly connected to the support frames 1. Liquid medicine injection ports 501-1 are disposed above the liquid medicine storage tanks 501, and lower parts are connected to the nebulizers 7 via connecting pipes 6. The nebulizers 7 are arranged inside the eye covering shells 2, a plurality of small holes 203 are disposed on inner walls of the outer diaphragms 202, and the liquid medicine is released through the small holes 203 on the outer diaphragms 202 after atomization, so that the liquid medicine may be better absorbed while performing massage treatment.

Pushing plates 501-2 are slidably connected in the liquid medicine storage tanks 501, ends of the pushing plates 501-2 away from the eye covering shells 2 are fixedly connected to pushing rods 501-3, the pushing rods 501-3 extend outward and extend into fixed blocks 502, and the fixed blocks 502 are arranged outside the support frames 1 and fixedly connected to the support frames 1. T-shaped sliding grooves 502-1 are disposed in the fixed blocks 502, control rods 503 are slidably connected in the sliding grooves 502-1, movable grooves 502-2 are disposed on upper surfaces of the fixed blocks 502, the movable grooves 502-2 are in communication with the sliding grooves 502-1, and the control rods 503 extend out of the movable grooves 502-2. A plurality of limiting grooves are disposed on the movable grooves 502-2, which are matched with limiting blocks 503-1 on the control rods 503.

Ends of the control rods 503 are movably connected to the pushing rods 501-3, and springs II 501-4 are sleeved on the pushing rods 501-3, ends of the springs II 501-4 are fixedly connected to outer walls of the liquid medicine storage tanks 501, and other ends are fixedly connected to the control rods 503. Longitudinal grooves are disposed on the control rods 503, and the pushing rods 501-3 are located in the longitudinal grooves, so that the control rods 503 may slide up and down.

Other ends of the control rods 503 are fixedly connected to sliding plates 504, the sliding plates 504 are slidably connected in the support frames 1, ends of the sliding plates 504 away from the eye covering shells 2 are fixedly connected to airbags I 505, ends of the airbags I 505 away from the eye covering shells 2 are connected to vent pipes 506, and other ends of the vent pipes 506 are connected to airbags II 8 fixed at tails of the support frames 1.

When wearing the massage device, in order to ensure wearing stability, the control rods 503 are lifted upward to separate the limiting blocks 503-1 from the limiting grooves, and the control rods 503 are pushed in the direction away from the eye covering shells 2 until they enter the desired limiting grooves, driving the pushing rods 501-3, the pushing plates 501-2 and the sliding plates 504 to slide in the direction away from the eye covering shells 2, the airbags I 505 contract and the gas inside enters the airbags II 8 through the vent pipes 506, so that the airbags II 8 expand to increase friction and avoid falling off; when using the atomization function, liquid medicine is injected into the liquid medicine storage tanks 501, and the nebulizers 7 are controlled to start, the liquid medicine is released through the small holes 203 on the outer diaphragms 202 after atomization, so that the liquid medicine may be better absorbed while performing massage treatment.

When use is completed, a cleaning agent for liquid medicine is injected into the liquid medicine storage tanks 501, and the control rods 503 are pushed forward, the springs drive reset, the pushing plates 501-2 slide in the direction close to the eye covering shells 2 to accelerate the movement of the cleaning agent, the cleaning agent cleans the internal connecting pipes 6 and also cleans the massage therapy zone through the small holes 203; the airbags II 8 contract and the gas inside enters the airbags I 505 through the vent pipes 506.

The use process of the present invention is as follows.

1. When a patient needs unilateral eye massage, the connecting rod 3 and the eye covering shell 2 on the other side may be removed, so that the eye that does not need massage may normally observe the external environment.

2. When wearing the massage device, in order to ensure wearing stability, the control rods

503 are lifted upward to separate the limiting blocks 503-1 from the limiting grooves, and the control rods 503 are pushed in the direction away from the eye covering shells 2 until they enter the desired limiting grooves, driving the pushing rods 501-3, the pushing plates 501-2 and the sliding plates 504 to slide in the direction away from the eye covering shells 2, the airbags I 505 contract and the gas inside enters the airbags II 8 through the vent pipes 506, so that the airbags II 8 expand to increase friction and avoid falling off.

The electrical connection state of the electromagnetic plates 401 is controlled by the controller; when the electromagnetic plates 401 are energized, their magnetism is opposite to that of the magnetic plates 404, the magnetic plates 404 are attracted to the electromagnetic plates 401, the springs I 403 contract, driving the massage heads 406 and the containing shells 407 to twist and contract inward; when the power is off, the magnetism disappears, the springs elongate under the action of elastic force, and the massage heads 406 and the containing shells 407 twist and extend outward;

When using the atomization function, liquid medicine is injected into the liquid medicine storage tanks 501, and the nebulizers 7 are controlled to start, the liquid medicine is released through the small holes 203 on the outer diaphragms 202 after atomization, so that the liquid medicine may be better absorbed while performing massage treatment.

3. When use is completed, a cleaning agent for liquid medicine is injected into the liquid medicine storage tanks 501, and the control rods 503 are pushed forward, the springs drive reset, the pushing plates 501-2 slide in the direction close to the eye covering shells 2 to accelerate the movement of the cleaning agent, the cleaning agent cleans the internal connecting pipes 6 and also cleans the massage therapy zone through the small holes 203; the airbags II 8 contract and the gas inside enters the airbags I 505 through the vent pipes 506.

The above shows and describes the basic principles, main features, and advantages of the present invention. Those skilled in the art will understand that the present invention is not limited by the above-mentioned examples; the content described in the above-mentioned examples and the specification only illustrates the principles of the present invention. Without departing from the spirit and scope of the present invention, the present invention

will also have various changes and improvements, and these changes and improvements all fall within the scope of the present invention as claimed. The scope of protection claimed by the present invention is defined by the appended claims and their equivalents.