



(12) Invention Patent Application

(10) Authorization announcement No.: CN 109771238 A

(43) Authorization announcement date: 05/21/2019

(21) Application No.: 201910056372.9

(22) Application date: 01/18/2019

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(51) Int.Cl.

A61H 7/00 (2006.01)

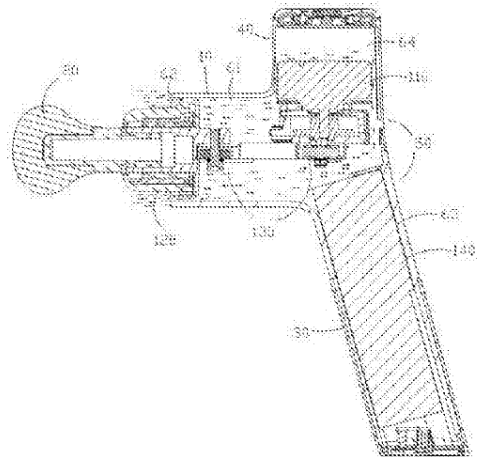
3 pages of Claims 7 pages of Description 6 pages of Drawings

(54) Name of invention

A Handheld Muscle Massager and a Massage Heat Dissipation Method Thereof

(57) Abstract

The present invention relates to a handheld muscle massager and a massage heat dissipation method thereof. Said massager comprises a massager body, a massage head, a main handle, and an auxiliary handle, wherein the main handle and the auxiliary handle are each connected to a handle connection end. The handheld muscle massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly. The massager body has a body internal cavity, said body internal cavity having a motion opening. The main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity. The body internal cavity, the main handle internal cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage.



1. A handheld muscle massager, characterized in that it comprises: a massager body, a massage head, a main handle, and an auxiliary handle; wherein,

said massager body has a massage head assembly end and a handle connection end, the massage head is assembled at said massage head assembly end, and the main handle and the auxiliary handle are each connected to said handle connection end, such that the massager body, the main handle, and the auxiliary handle are joined to form an integral unit;

a smooth pressing-and-gripping surface is formed at a junction where the massager body, the main handle, and the auxiliary handle are connected, allowing a user to grip or press against said smooth pressing-and-gripping surface to perform downward-pressure massage;

a main inclusion angle is formed between the massager body and the main handle, an auxiliary inclusion angle is formed between the massager body and the auxiliary handle, and a handle inclusion angle is formed between the main handle and the auxiliary handle.

2. The handheld muscle massager according to Claim 1, characterized in that: the handheld muscle massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly; the massager body has a body internal cavity, said body internal cavity having a motion opening; the main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity; the body internal cavity, the main handle internal cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor, the piston-type motion head, and the connecting rod assembly are all disposed within the ventilation and heat dissipation passage; the massage head is assembled on the piston-type motion head, and the piston-type motion head is positioned within the motion opening; the connecting rod assembly is connected between the drive motor and the piston-type motion head; the drive motor drives the piston-type motion head to perform high-speed reciprocating motion within the motion opening via the connecting rod assembly;

through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled from the ventilation and heat dissipation passage by the same reciprocating motion of the piston-type motion head.

3. The handheld muscle massager according to Claim 2, characterized in that: the handheld muscle massager further comprises a battery assembly, and said battery assembly is also disposed within the ventilation and heat dissipation passage.

4. The handheld muscle massager according to Claim 2, characterized in that: the motion opening serves simultaneously as an air inlet and an air outlet of the ventilation and heat dissipation passage; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled back through the motion opening by the same reciprocating motion of the piston-type motion head.

5. The handheld muscle massager according to Claim 2, characterized in that: the motion opening is an air inlet of the ventilation and heat dissipation passage, and the ventilation and heat dissipation passage has an air outlet; said air outlet is disposed on the main handle or the auxiliary handle; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled through the air outlet by the same reciprocating motion of the piston-type motion head.

6. The handheld muscle massager according to Claim 5, characterized in that: the air outlet is disposed at a top end of the auxiliary handle; the drive motor is disposed within the auxiliary handle internal cavity; and a main circuit board is also disposed within the auxiliary handle internal cavity, wherein the main circuit board is disposed above the drive motor and fixedly connected below the air outlet.

7. The handheld muscle massager according to Claim 2, characterized in that: the motion opening is an air inlet of the ventilation and heat dissipation passage, and the ventilation and heat dissipation passage has air outlets; said air outlets are disposed on both the main handle and the auxiliary handle; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled through the air outlets by the same reciprocating motion of the piston-type motion head.

8. The handheld muscle massager according to any one of Claims 2 to 7, characterized in that: an adaptive adjustment

structural clearance is provided at a connection position between the connecting rod assembly and the piston-type motion head; when the drive motor drives the piston-type motion head to move via the connecting rod assembly, first, the drive motor drives the connecting rod assembly to move, and simultaneously, the connecting rod assembly drives the piston-type motion head to move; at this point, a driving force transmitted to the piston-type motion head through the connecting rod assembly automatically adjusts the adaptive adjustment structural clearance, such that the connecting rod assembly and the piston-type motion head naturally align their connection positional relationship by means of said driving force.

9. The handheld muscle massager according to Claim 8, characterized in that: a cam is sleeved on an output shaft of the drive motor; the connecting rod assembly is a rigid connecting rod, one end of the rigid connecting rod is fixedly locked on the cam, and the other end of the rigid connecting rod is pivotally connected within the piston-type motion head; the adaptive adjustment structural clearance is located at a position where the rigid connecting rod and the piston-type motion head are pivotally connected; one end of the piston-type motion head is provided with a pivot groove, the rigid connecting rod is inserted into the pivot groove, and a pivot bolt pivotally connects the rigid connecting rod within the pivot groove; the adaptive adjustment structural clearance is simultaneously located between a top surface of the rigid connecting rod and a groove top surface of the pivot groove, and between a bottom surface of the rigid connecting rod and a groove bottom surface of the pivot groove.

10. The handheld muscle massager according to any one of Claims 2 to 7, characterized in that: the massage head is assembled on the piston-type motion head via a detachable connection unit; the detachable connection unit comprises a plug, and the massage head is detachably assembled on the plug; wherein the massage head has a detachment groove, a plurality of snap rings are annularly disposed on the plug, and a positioning groove is recessed in an outer surface of the plug along a longitudinal direction of the plug.

11. The handheld muscle massager according to any one of Claims 2 to 7, characterized in that: the massage head is assembled on the piston-type motion head via a detachable connection unit; the detachable connection unit comprises a front connection nozzle, a plug is inserted into the front connection nozzle, and the front connection nozzle is provided with an insertion hole into which the plug is inserted; a connection sleeve assembly is sleeved on the plug and is positioned between the plug and the insertion hole; the insertion hole has a smooth-surface hole inner wall, and the connection sleeve assembly has a smooth-surface outer connection surface corresponding to the smooth-surface hole inner wall; the smooth-surface outer connection surface and the smooth-surface hole inner wall are fitted together to form a vacuum connection relationship.

12. A handheld muscle massager, characterized in that it comprises: a massager body, a massage head, a main handle, and an auxiliary handle; wherein, said massager body has a massage head assembly end and a handle connection end, the massage head is assembled at said massage head assembly end, and the main handle and the auxiliary handle are each connected to said handle connection end;

the handheld muscle massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly; the massager body has a body internal cavity, said body internal cavity having a motion opening; the main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity; the body internal cavity, the main handle internal cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor, the piston-type motion head, and the connecting rod assembly are all disposed within the ventilation and heat dissipation passage; the massage head is assembled on the piston-type motion head, and the piston-type motion head is positioned within the motion opening; the connecting rod assembly is connected between the drive motor and the piston-type motion head; the drive motor drives the piston-type motion head to perform high-speed reciprocating motion within the motion opening via the connecting rod assembly; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled from the ventilation and heat dissipation passage by the same reciprocating motion of the piston-type motion head.

13. A massage heat dissipation method for a muscle massager, characterized in that: said massager comprises a massager body, a massage head, a main handle, and an auxiliary handle, the main handle and the auxiliary handle being each connected to the massager body such that the massager body, the main handle, and the auxiliary handle are joined to form an integral unit; during massage, a user holds the main handle and the auxiliary handle simultaneously with both hands and presses the massage head against a human body to perform massage; a smooth pressing-and-gripping surface is formed at a junction where the massager body, the main handle, and the auxiliary handle are connected, allowing the user to grip or press against said smooth pressing-and-gripping surface to perform downward-pressure massage;

the massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly; the massager body has a body internal cavity, said body internal cavity, body internal cavity having a motion opening; the main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity; the body internal cavity, the main handle internal cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor, the piston-type motion head, and the connecting rod assembly are all disposed within the ventilation and heat dissipation passage; the massage head is assembled on the piston-type motion head, and the piston-type motion head is positioned within the motion opening; the connecting rod assembly is connected between the drive motor and the piston-type motion head; the drive motor drives the piston-type motion head to perform high-speed reciprocating motion within the motion opening via the connecting rod assembly;

through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled from the ventilation and heat dissipation passage by the same reciprocating motion of the piston-type motion head, thereby dissipating heat from the components housed within the ventilation and heat dissipation passage.

A Handheld Muscle Massager and a Massage Heat Dissipation Method Thereof

Technical field

[0001] The present invention relates to a massager and a massage heat dissipation method thereof, and more particularly to a massager having a distinctive gripping configuration and an improved heat dissipation structure, and a massage heat dissipation method thereof.

Prior art

[0002] A massager is a new generation of healthcare equipment developed based on physics, bionics, bioelectricity, medicine, and years of clinical practice. By utilizing multiple independent soft-touch massage heads, it can achieve the effects of relaxing muscles, soothing nerves, promoting blood circulation, strengthening cellular metabolism, and enhancing skin elasticity; at the same time, it can also relieve fatigue, significantly alleviate various chronic pains, acute pains, and muscle soreness, relax the body and reduce stress, and reduce skin wrinkles. In particular, following high-intensity muscle training, use of a massager can greatly relieve muscle soreness and aid in muscle recovery.

[0003] Generally speaking, a massager is mainly composed of an iron core, a coil, an oscillator, and a massage head. When the coil wound on the fixed iron core is connected to alternating current, an alternating magnetic field is generated. Under the combined action of the magnetic field force and the oscillator, the massage head vibrates repeatedly to produce a massaging effect on the human body.

[0004] Among many massager products, handheld massagers are particularly widely used. As shown in Figures 1 and 2, two relatively representative handheld massagers are illustrated.

[0005] The handheld massager shown in Figure 1 mainly includes a body 1 and a handle 2. A massage head 3 is disposed at the front end of the body 1. The motor, battery, and other components are centrally assembled in the body 1. In use, the user holds the handle 2 and presses the massage head 3 against the human body for massage. This massager suffers from notable shortcomings during use. First, because the user can only hold the handle 2 with a single hand, insufficient gripping and pressing force is unavoidable, thereby compromising the massage effect. Second, because the principal components are all centrally housed within the body 1 without any dedicated heat dissipation structure, product overheating frequently occurs during extended use, adversely affecting both product service life and user experience.

[0006] Figure 2 shows a simplified handheld massager in which the handle 4 and the body 5 are joined to form an integral unit. This design likewise suffers from the aforementioned shortcomings of insufficient gripping and pressing force, inadequate massage effect, and unsatisfactory heat dissipation.

[0007] The foregoing represent the principal shortcomings of conventional handheld massagers.

Content of the invention

[0008] The technical solution adopted by the present invention is: a handheld muscle massager, comprising a massager body, a massage head, a main handle, and an auxiliary handle, wherein the massager body has a massage head assembly end and a handle connection end, the massage head is assembled at the massage head assembly end, and the main handle and the auxiliary handle are each connected to the handle connection end, such that the massager body, the main handle, and the auxiliary handle are joined to form an integral unit.

[0009] A smooth pressing-and-gripping surface is formed at a junction where the massager body, the main handle, and the auxiliary handle are connected, allowing a user to grip or press against the smooth pressing-and-gripping surface to perform downward-pressure massage.

[0010] A main inclusion angle is formed between the massager body and the main handle, an auxiliary inclusion angle is formed between the massager body and the auxiliary handle, and a handle inclusion angle is formed between the main handle and the auxiliary handle.

[0011] The handheld muscle massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly; the massager body has a body internal cavity, the body internal cavity having a motion opening; the main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity; the body internal cavity, the main handle internal cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor, the piston-type motion head, and the connecting rod assembly are all disposed within the ventilation and heat dissipation passage; the massage head is assembled on the piston-type motion head, and the piston-type motion head is positioned within the motion opening; the connecting rod assembly is connected between the drive motor and the piston-type motion head; the drive motor drives the piston-type motion head to perform high-speed reciprocating motion within the motion opening via the connecting rod assembly; through the reciprocating motion of the piston-type motion

head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled from the ventilation and heat dissipation passage by the same reciprocating motion of the piston-type motion head.

[0012] The handheld muscle massager further comprises a battery assembly, and the battery assembly is also disposed within the ventilation and heat dissipation passage.

[0013] The motion opening serves simultaneously as an air inlet and an air outlet of the ventilation and heat dissipation passage; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled back through the motion opening by the same reciprocating motion of the piston-type motion head.

[0014] The motion opening is an air inlet of the ventilation and heat dissipation passage, and the ventilation and heat dissipation passage has an air outlet; the air outlet is disposed on the main handle or the auxiliary handle; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled through the air outlet by the same reciprocating motion of the piston-type motion head. The air outlet is disposed at the top end of the auxiliary handle; the drive motor is disposed within the auxiliary handle internal cavity, and meanwhile, a main circuit board is also disposed within the auxiliary handle internal cavity; the main circuit board is disposed above the drive motor and is fixedly connected below the air outlet.

[0015] The motion opening is an air inlet of the ventilation and heat dissipation passage, and the ventilation and heat dissipation passage has air outlets; the air outlets are disposed on both the main handle and the auxiliary handle; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled through the air outlets by the same reciprocating motion of the piston-type motion head.

[0016] An adaptive adjustment structural clearance is provided at a connection position between the connecting rod assembly and the piston-type motion head; when the drive motor drives the piston-type motion head to move via the connecting rod assembly, first, the drive motor drives the connecting rod assembly to move, and simultaneously, the connecting rod assembly drives the piston-type motion head to move; at this point, a driving force transmitted to the piston-type motion head through the connecting rod assembly automatically adjusts the adaptive adjustment structural clearance, such that the connecting rod assembly and the piston-type motion head naturally align their connection positional relationship by means of said driving force.

[0017] A cam is sleeved on an output shaft of the drive motor; the connecting rod assembly is a rigid connecting rod, one end of the rigid connecting rod is fixedly locked on the cam, and the other end of the rigid connecting rod is pivotally connected within the piston-type motion head; the adaptive adjustment structural clearance is located at a position where the rigid connecting rod and the piston-type motion head are pivotally connected; one end of the piston-type motion head is provided with a pivot groove, the rigid connecting rod is inserted into the pivot groove, and a pivot bolt pivotally connects the rigid connecting rod within the pivot groove; the adaptive adjustment structural clearance is simultaneously located between a top surface of the rigid connecting rod and a groove top surface of the pivot groove, and between a bottom surface of the rigid connecting rod and a groove bottom surface of the pivot groove.

[0018] The massage head is assembled on the piston-type motion head via a detachable connection unit; the detachable connection unit comprises a plug, and the massage head is detachably assembled on the plug; wherein the massage head has a detachment groove, a plurality of snap rings are annularly disposed on the plug, and a positioning groove is recessed in an outer surface of the plug along a longitudinal direction of the plug.

[0019] The massage head is assembled on the piston-type motion head via a detachable connection unit; the detachable connection unit comprises a front connection nozzle, a plug is inserted into the front connection nozzle, and the front connection nozzle is provided with an insertion hole into which the plug is inserted; a connection sleeve assembly is sleeved on the plug and is positioned between the plug and the insertion hole; the insertion hole has a smooth-surface hole inner wall, and the connection sleeve assembly has a smooth-surface outer connection surface corresponding to the smooth-surface hole inner wall; the smooth-surface outer connection surface and the smooth-surface hole inner wall are fitted together to form a vacuum connection relationship.

[0020] A handheld muscle massager, comprising a massager body, a massage head, a main handle, and an auxiliary handle, wherein the massager body has a massage head assembly end and a handle connection end, the massage head is assembled at the massage head assembly end, and the main handle and the auxiliary handle are each connected to the handle connection end. The handheld muscle massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly; the massager body has a body internal cavity, the body internal cavity having a motion opening; the main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity; the body internal cavity, the main handle internal

cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor, the piston-type motion head, and the connecting rod assembly are all disposed within the ventilation and heat dissipation passage; the massage head is assembled on the piston-type motion head, and the piston-type motion head is positioned within the motion opening; the connecting rod assembly is connected between the drive motor and the piston-type motion head; the drive motor drives the piston-type motion head to perform high-speed reciprocating motion within the motion opening via the connecting rod assembly; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled from the ventilation and heat dissipation passage by the same reciprocating motion of the piston-type motion head.

[0021] A massage heat dissipation method for a muscle massager, wherein the massager comprises a massager body, a massage head, a main handle, and an auxiliary handle, the main handle and the auxiliary handle being each connected to the massager body such that the massager body, the main handle, and the auxiliary handle are joined to form an integral unit; during massage, a user holds the main handle and the auxiliary handle simultaneously with both hands and presses the massage head against a human body to perform massage; a smooth pressing-and-gripping surface is formed at a junction where the massager body, the main handle, and the auxiliary handle are connected, allowing the user to grip or press against the smooth pressing-and-gripping surface to perform downward-pressure massage.

[0022] The massager further comprises a drive motor, a piston-type motion head, and a connecting rod assembly; the massager body has a body internal cavity, the body internal cavity having a motion opening; the main handle has a main handle internal cavity, and the auxiliary handle has an auxiliary handle internal cavity; the body internal cavity, the main handle internal cavity, and the auxiliary handle internal cavity are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor, the piston-type motion head, and the connecting rod assembly are all disposed within the ventilation and heat dissipation passage; the massage head is assembled on the piston-type motion head, and the piston-type motion head is positioned within the motion opening; the connecting rod assembly is connected between the drive motor and the piston-type motion head; the drive motor drives the piston-type motion head to perform high-speed reciprocating motion within the motion opening via the connecting rod assembly; through the reciprocating motion of the piston-type motion head, external air is drawn into the ventilation and heat dissipation passage from the motion opening, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is expelled from the ventilation and heat dissipation passage by the same reciprocating motion of the piston-type motion head, thereby dissipating heat from the components housed within the ventilation and heat dissipation passage.

[0023] The present invention provides the following advantageous effects. In use, a user may hold the main handle and the auxiliary handle simultaneously with both hands and press the massage head against a human body to perform massage, or may hold either the main handle or the auxiliary handle with a single hand. The user may additionally grip the smooth pressing-and-gripping surface to apply downward-pressure massage, or bear down against said surface with a single hand. By virtue of the smooth pressing-and-gripping surface design, the present invention eliminates the rear-protruding structural elements found in conventional massagers, allowing the user's palm to rest comfortably against the rear of the massager, thereby enhancing user experience and facilitating force application for an improved massage effect.

[0024] In addition, through the reciprocating motion of the piston-type motion head, the present invention draws external air into the ventilation and heat dissipation passage via the motion opening; after said air absorbs heat within the passage, it is expelled by the same reciprocating action, thereby dissipating heat from the components housed within the ventilation and heat dissipation passage.

[0025] Furthermore, an adaptive adjustment structural clearance is provided at the connection position between the connecting rod assembly and the piston-type motion head; when the drive motor drives the piston-type motion head to move via the connecting rod assembly, the drive motor first drives the connecting rod assembly, which in turn drives the piston-type motion head; at this point, a driving force transmitted to the piston-type motion head through the connecting rod assembly automatically adjusts the adaptive adjustment structural clearance, allowing the connecting rod assembly and the piston-type motion head to naturally align their connection positional relationship by means of said driving force, thereby achieving a smoother overall transmission relationship and preventing jamming or heat generation caused by hard friction.

Brief description of the drawings

[0026] Figures 1 and 2 are schematic structural views of conventional massagers.

[0027] Figure 3 is a schematic perspective view of the present invention.

[0028] Figure 4 is a schematic view of the present invention in an in-use state.

[0029] Figure 5 is a schematic heat dissipation view of a first embodiment of the ventilation and heat dissipation passage of the present invention.

[0030] Figure 6 is a schematic heat dissipation view of a second embodiment of the ventilation and heat dissipation passage of the present invention.

[0031] Figure 7 is a schematic cross-sectional structural view of the drive motor, the piston-type motion head, and the connecting rod assembly of the present invention.

[0032] Figure 8 is a top view of the drive motor, the piston-type motion head, and the connecting rod assembly of the present invention.

[0033] Figure 9 is a schematic perspective exploded view of the present invention.

[0034] Figure 10 is a schematic structural view of the detachable connection unit of the present invention.

Detailed description of embodiments

[0035] As shown in Figures 3 to 10, a handheld muscle massager comprises a massager body 10, a massage head 20, a main handle 30, and an auxiliary handle 40.

[0036] As shown in Figures 3 to 4, the massager body 10 has a massage head assembly end 11 and a handle connection end 12.

[0037] In a specific embodiment, the massage head assembly end 11 and the handle connection end 12 are respectively located at the front and rear ends of the massager body 10.

[0038] The massage head 20 is assembled at the massage head assembly end 11.

[0039] The main handle 30 and the auxiliary handle 40 are each connected to the handle connection end 12, such that the massager body 10, the main handle 30, and the auxiliary handle 40 are joined to form an integral unit.

[0040] As shown in Figure 4, in use, a user holds the main handle 30 and the auxiliary handle 40 simultaneously with both hands and presses the massage head 20 against a human body to perform massage. The user may also hold the main handle 30 or the auxiliary handle 40 with a single hand to perform massage.

[0041] A smooth pressing-and-gripping surface 50 is formed at a junction where the massager body 10, the main handle 30, and the auxiliary handle 40 are connected; the user can grip the smooth pressing-and-gripping surface 50 to perform downward-pressure massage, or press against the smooth pressing-and-gripping surface 50 with a single hand to perform downward-pressure massage.

[0042] By virtue of the smooth pressing-and-gripping surface 50, the present invention eliminates the rear-protruding structural elements found in conventional massagers, allowing the user's palm to rest comfortably against the rear of the massager; this not only enhances user experience but also facilitates force application for an improved massage effect.

[0043] A main inclusion angle 51 is formed between the massager body 10 and the main handle 30, an auxiliary inclusion angle 52 is formed between the massager body 10 and the auxiliary handle 40, and a handle inclusion angle 53 is formed between the main handle 30 and the auxiliary handle 40.

[0044] In practice, the overall configuration of the product can be precisely defined by varying the values of the aforementioned three inclusion angles; one preferred embodiment is set forth below.

[0045] The main inclusion angle 51 is greater than 90° and less than or equal to 135°, the auxiliary inclusion angle 52 is 90°, and the handle inclusion angle 53 is greater than 135° and less than or equal to 180°.

[0046] In a specific embodiment, the handle inclusion angle 53 is equal to 180°, and the smooth pressing-and-gripping surface 50 is a vertical surface, such as the outer surface of a cylinder.

[0047] As shown in Figures 3 to 9, the handheld muscle massager further comprises a drive motor 110, a piston-type motion head 120, and a connecting rod assembly 130; the massager body 10 has a body internal cavity 61, the body internal cavity 61 having a motion opening 62; the main handle 30 has a main handle internal cavity 63, and the auxiliary handle 40 has an auxiliary handle internal cavity 64.

[0048] The body internal cavity 61, the main handle internal cavity 63, and the auxiliary handle internal cavity 64 are in fluid communication with each other to form a ventilation and heat dissipation passage.

[0049] The drive motor 110, the piston-type motion head 120, and the connecting rod assembly 130 are all disposed within the ventilation and heat dissipation passage.

[0050] The massage head 20 is assembled on the piston-type motion head 120, and the piston-type motion head 120 is positioned within the motion opening 62.

[0051] The connecting rod assembly 130 is connected between the drive motor 110 and the piston-type motion head 120; the drive motor 110 drives the piston-type motion head 120 to perform high-speed reciprocating motion within the motion opening 62 via the connecting rod assembly 130.

[0052] Through the reciprocating motion of the piston-type motion head 120, external air is drawn into the ventilation and heat dissipation passage via the motion opening 62; after said air absorbs heat within the passage, it is expelled by the same reciprocating action, thereby dissipating heat from the components housed within the ventilation and heat dissipation passage.

[0053] In a specific embodiment, the handheld muscle massager further comprises a battery assembly 140, and the battery assembly 140 is also disposed within the ventilation and heat dissipation passage.

[0054] In a specific embodiment, the drive motor 110 may be disposed within the main handle internal cavity 63 or the auxiliary handle internal cavity 64; the battery assembly 140 may also be disposed within the main handle internal cavity 63 or the auxiliary handle internal cavity 64; and the piston-type motion head 120 and the connecting rod assembly 130 are disposed within the body internal cavity 61.

[0055] In various embodiments, the ventilation and heat dissipation passage may operate according to the following manners.

[0056] As shown in Figure 5, in Manner 1, the motion opening 62 serves simultaneously as an air inlet and an air outlet of the ventilation and heat dissipation passage; through the reciprocating motion of the piston-type motion head 120, external air is drawn into the ventilation and heat dissipation passage from the motion opening 62, and after the external air absorbs heat within the ventilation and heat dissipation passage, it is pumped out from the motion opening 62 again by means of the reciprocating motion of the piston-type motion head 120, thereby achieving heat dissipation for various components within the ventilation and heat dissipation passage.

[0057] As shown in Figure 6, in Manner 2, the motion opening 62 is an air inlet of the ventilation and heat dissipation passage, and the ventilation and heat dissipation passage has an air outlet 65; said air outlet 65 is disposed on the main handle 30 or the auxiliary handle 40.

[0058] Through the reciprocating motion of the piston-type motion head 120, external air is drawn into the ventilation and heat dissipation passage from the motion opening 62; after the external air absorbs heat within the ventilation and heat dissipation passage, it is pumped out from the air outlet 65 by means of the reciprocating motion of the piston-type motion head 120, thereby achieving heat dissipation for various components within the ventilation and heat dissipation passage.

[0059] In a specific embodiment, the air outlet 65 is disposed at the top end of the auxiliary handle 40, and the drive motor 110 is disposed within the auxiliary handle internal cavity 64, such that the ventilation and heat dissipation passage primarily dissipates heat for the drive motor 110.

[0060] Meanwhile, a main circuit board 111 is also disposed within the auxiliary handle internal cavity 64; in a preferred embodiment, the main circuit board 111 is disposed above the drive motor 110 and is fixedly connected below the air outlet 65.

[0061] In Manner 3, the motion opening 62 is an air inlet of the ventilation and heat dissipation passage, and the ventilation and heat dissipation passage has air outlets 65; the air outlets 65 are disposed on both the main handle 30 and the auxiliary handle 40.

[0062] Through the reciprocating motion of the piston-type motion head 120, external air is drawn into the ventilation and heat dissipation passage via the motion opening 62; after absorbing heat within the passage, the air is expelled through the air outlet 65, thereby dissipating heat from the components housed within the ventilation and heat dissipation passage.

[0063] In a specific embodiment, a preferred arrangement is that the air outlet 65 is disposed at the top end of the auxiliary handle 40, and meanwhile, the air outlet 65 is also disposed on one side of the main handle 30.

[0064] Alternatively, the air outlet 65 may be disposed at the top end of the auxiliary handle 40 while also being disposed at the bottom end of the main handle 30.

[0065] Additionally, the air outlets 65 may be disposed on the side surfaces of both the main handle 30 and the auxiliary handle 40.

[0066] In Manners 1, 2, and 3, the drive motor 110 and the battery assembly 140 may be respectively disposed in the main handle 30 and the auxiliary handle 40, or both the drive motor 110 and the battery assembly 140 may be disposed together within either the main handle 30 or the auxiliary handle 40.

[0067] As shown in Figures 7 and 8, in a specific embodiment, the connecting rod assembly 130 is connected between the drive motor 110 and the piston-type motion head 120; the drive motor 110 drives the piston-type motion head 120 to perform high-speed reciprocating motion within the motion opening 62 via the connecting rod assembly 130.

[0068] An adaptive adjustment structural clearance 200 is provided at a connection position between the connecting rod assembly 130 and the piston-type motion head 120.

[0069] When the drive motor 110 drives the piston-type motion head 120 to move via the connecting rod assembly 130, first, the drive motor 110 drives the connecting rod assembly 130 to move, and simultaneously, the connecting rod assembly 130 drives the piston-type motion head 120 to move; at this point, a driving force transmitted to the piston-type motion head 120 through the connecting rod assembly 130 automatically adjusts the adaptive adjustment structural clearance 200, such that the connecting rod assembly 130 and the piston-type motion head 120 naturally align their connection positional relationship by means of said driving force, thereby achieving a smoother overall transmission relationship and preventing jamming or heat generation caused by hard friction.

[0070] In practice, were the adaptive adjustment structural clearance 200 absent, the connecting rod assembly 130 and the piston-type motion head 120 would require a rigid fixed connection; under such conditions, even a minor assembly error would inevitably produce hard friction from an imperfect transmission relationship, generating significant operational noise that degrades user experience and substantially shortens product service life.

[0071] In a specific embodiment, a cam 112 is sleeved on an output shaft of the drive motor 110; the connecting rod assembly 130 is a rigid connecting rod, one end of the rigid connecting rod is fixedly locked on the cam 112, and the other end of the rigid connecting rod is pivotally connected within the piston-type motion head 120; the adaptive adjustment structural clearance 200 is located at a position where the rigid connecting rod and the piston-type motion head 120 are pivotally connected.

[0072] In practice, one end of the piston-type motion head 120 is provided with a pivot groove 121, the rigid connecting rod is inserted into the pivot groove 121, and a pivot bolt 122 pivotally connects the rigid connecting rod within the pivot groove 121.

[0073] The adaptive adjustment structural clearance 200 is simultaneously located between a top surface of the rigid connecting rod and a groove top surface of the pivot groove 121, and between a bottom surface of the rigid connecting rod and a groove bottom surface of the pivot groove 121.

[0074] As shown in Figures 9 and 10, in a specific embodiment, the massage head 20 is assembled on the piston-type motion head 120 via a detachable connection unit 300.

[0075] In practice, the massage head 20 may take various shapes.

[0076] The detachable connection unit 300 comprises a plug 310, and the massage head 20 is detachably assembled on the plug 310; wherein the massage head 20 has a detachment groove 311, and a plurality of snap rings 312 are annularly disposed on the plug 310.

[0077] When the plug 310 is inserted into the detachment groove 311, the longitudinal relative position between the massage head 20 and the plug 310 is fixed by means of the plurality of snap rings 312, so that the massage head 20 will not easily fall off from the plug 310.

[0078] Along the longitudinal direction of the plug 310, a positioning groove 313 is recessed in the outer surface of the plug 310; the lateral relative position between the massage head 20 and the plug 310 can be fixed through the positioning groove 313, preventing the massage head 20 from rotating on the plug 310 to enhance the user experience.

[0079] The detachable connection unit 300 further comprises a front connection nozzle 320; the plug 310 is inserted into the front connection nozzle 320, and the front connection nozzle 320 is provided with an insertion hole 321 into which the plug 310 is inserted.

[0080] A connection sleeve assembly 330 is sleeved on the plug 310 and is positioned between the plug 310 and the insertion hole 321.

[0081] The insertion hole 321 has a smooth-surface hole inner wall, and the connection sleeve assembly 330 has a smooth-surface outer connection surface 331 corresponding to the smooth-surface hole inner wall.

[0082] The smooth-surface outer connection surface 331 and the smooth-surface hole inner wall are fitted together to form a vacuum connection relationship, thereby enhancing the stability of the plug 310 inserted in the front connection nozzle 320.

[0083] In a specific embodiment, the connection sleeve assembly 330 comprises a connection sleeve 332 and a connection ring 333; the outer surface of the connection sleeve 332 and the outer surface of the connection ring 333 constitute the smooth-surface outer connection surface 331.

[0084] As shown in Figures 3 to 10, a massage heat dissipation method for a muscle massager; said massager comprises a massager body 10, a massage head 20, a main handle 30, and an auxiliary handle 40, the main handle 30 and the auxiliary handle 40 being each connected to the massager body 10 such that the massager body 10, the main handle 30, and the auxiliary handle 40 are joined to form an integral unit; during massage, a user holds the main handle 30 and the auxiliary handle 40 simultaneously with both hands and presses the massage head 20 against a human body to perform massage; a smooth pressing-and-gripping surface 50 is formed at a junction where the massager body 10, the main handle 30, and the auxiliary handle 40 are connected, allowing the user to grip or press against the smooth pressing-and-gripping surface 50 to perform downward-pressure massage.

[0085] The massager further comprises a drive motor 110, a piston-type motion head 120, and a connecting rod assembly 130; the massager body 10 has a body internal cavity 61, the body internal cavity 61 having a motion opening 62; the main handle 30 has a main handle internal cavity 63, and the auxiliary handle 40 has an auxiliary handle internal cavity 64; the body internal cavity 61, the main handle internal cavity 63, and the auxiliary handle internal cavity 64 are in fluid communication with each other to form a ventilation and heat dissipation passage; the drive motor 110, the piston-type motion head 120, and the connecting rod assembly 130 are all disposed within the ventilation and heat dissipation passage; the massage head 20 is assembled on the piston-type motion head 120, and the piston-type motion head 120 is positioned within the motion opening 62; the connecting rod assembly 130 is connected between the drive motor 110 and the piston-type motion head 120; the drive motor 110 drives the piston-type motion head 120 to perform high-speed reciprocating motion within the motion opening 62 via the connecting rod assembly 130.

[0086] Through the reciprocating motion of the piston-type motion head 120, external air is drawn into the ventilation and heat dissipation passage via the motion opening 62; after absorbing heat within the passage, the air is expelled by the same reciprocating action, thereby dissipating heat from the components housed within the ventilation and heat dissipation passage.

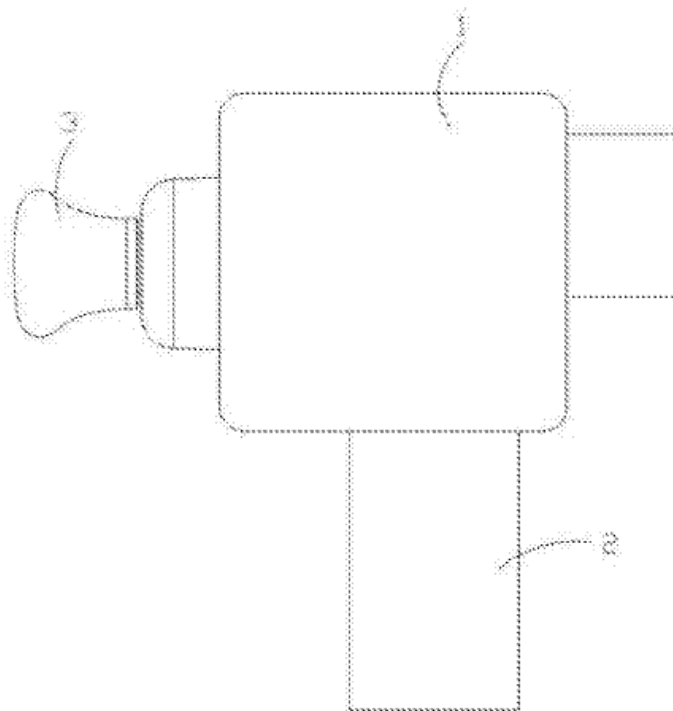


Figure 1

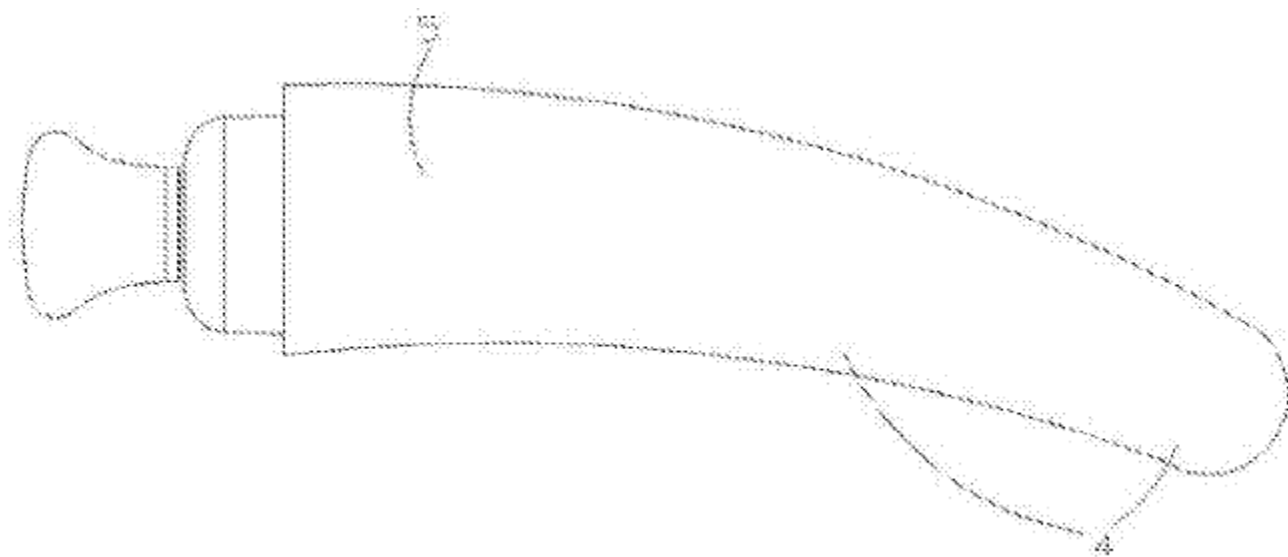


Figure 2

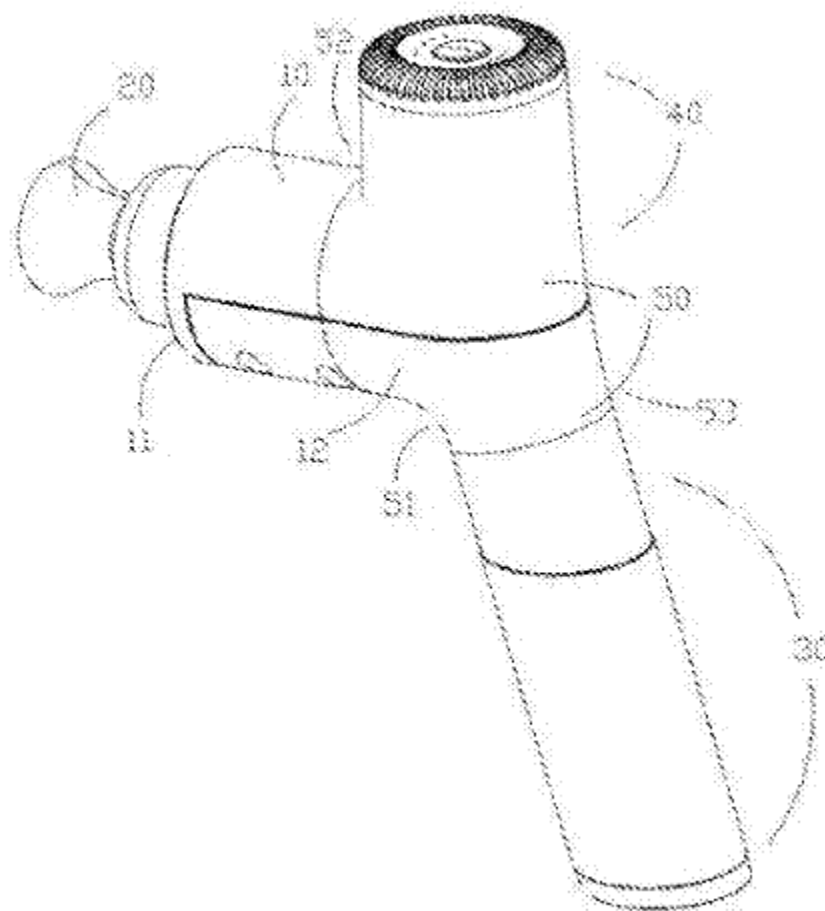


Figure 3

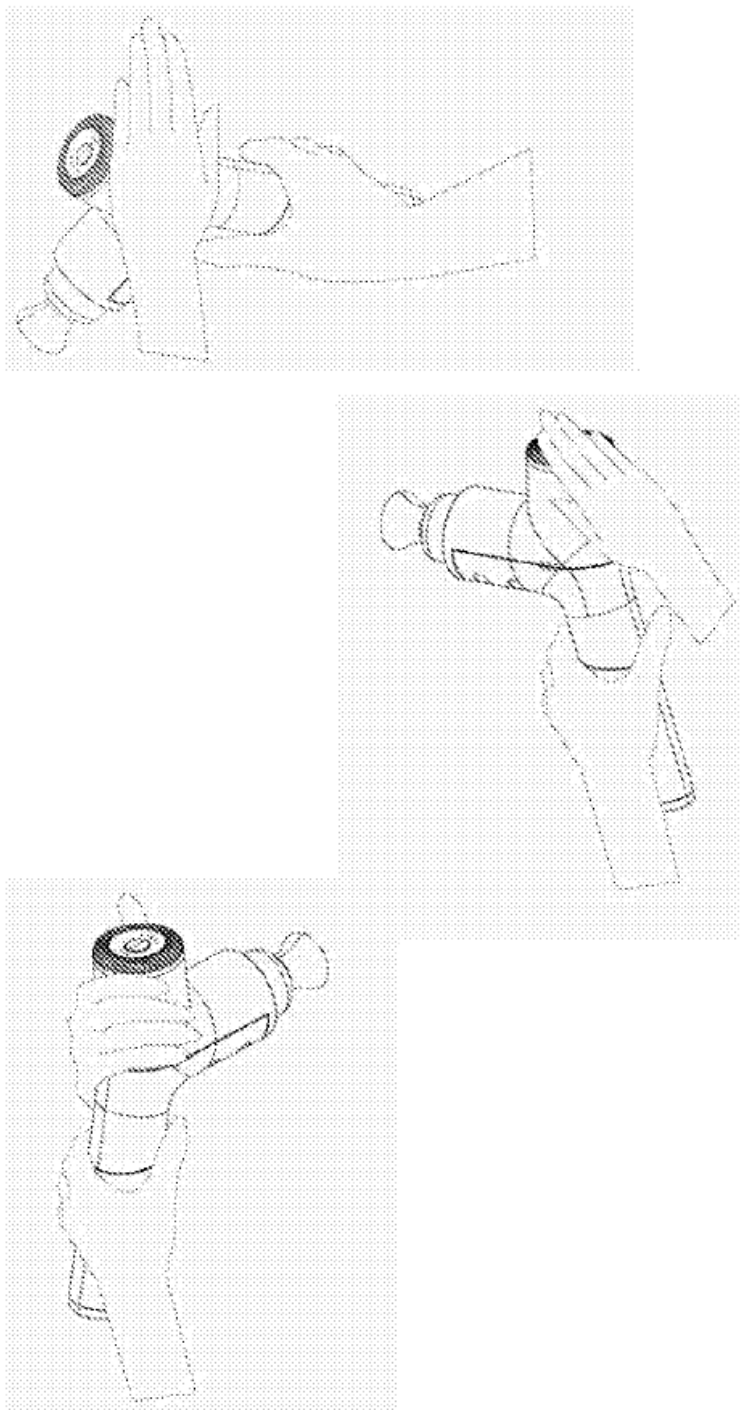


Figure 4

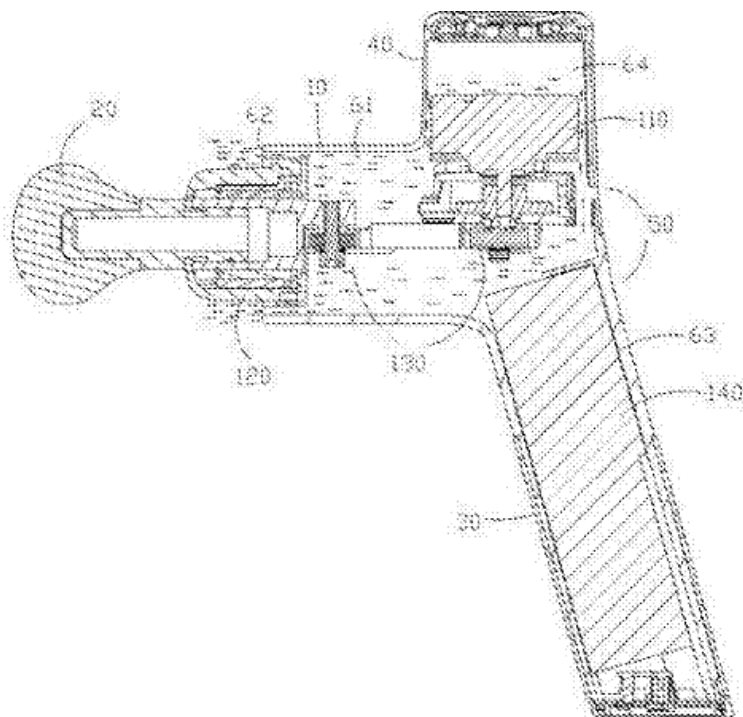


Figure 5

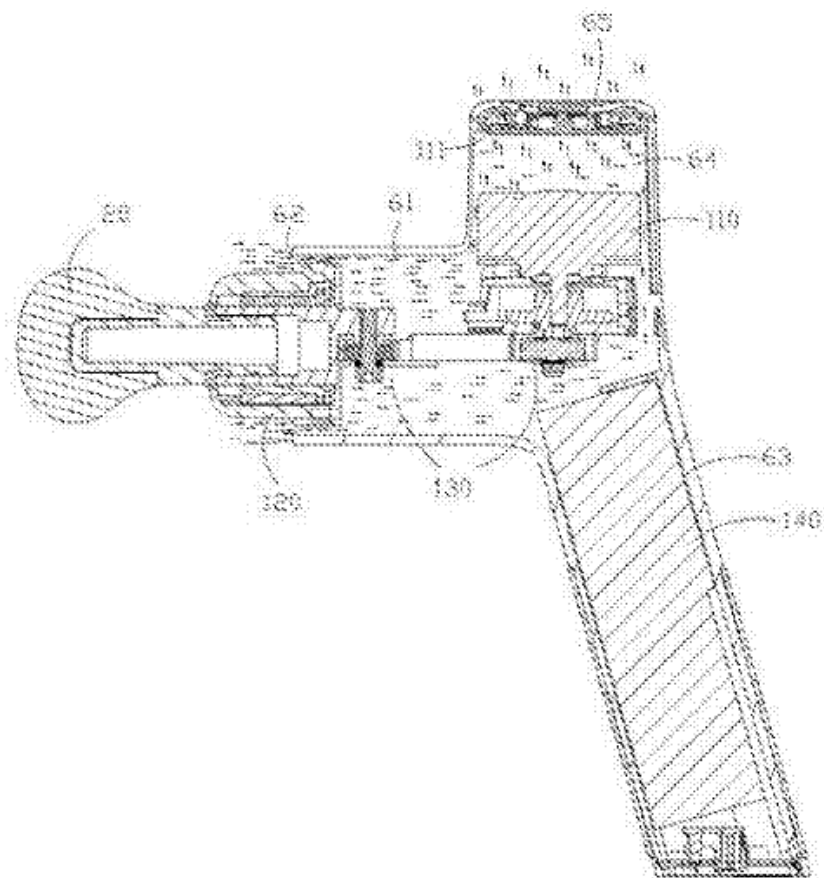


Figure 6

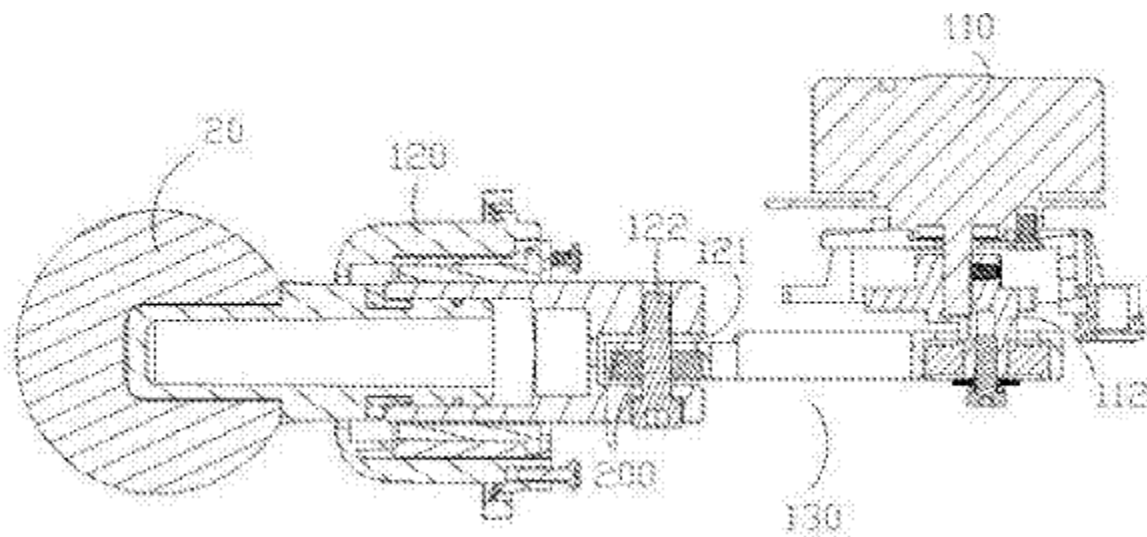


Figure 7

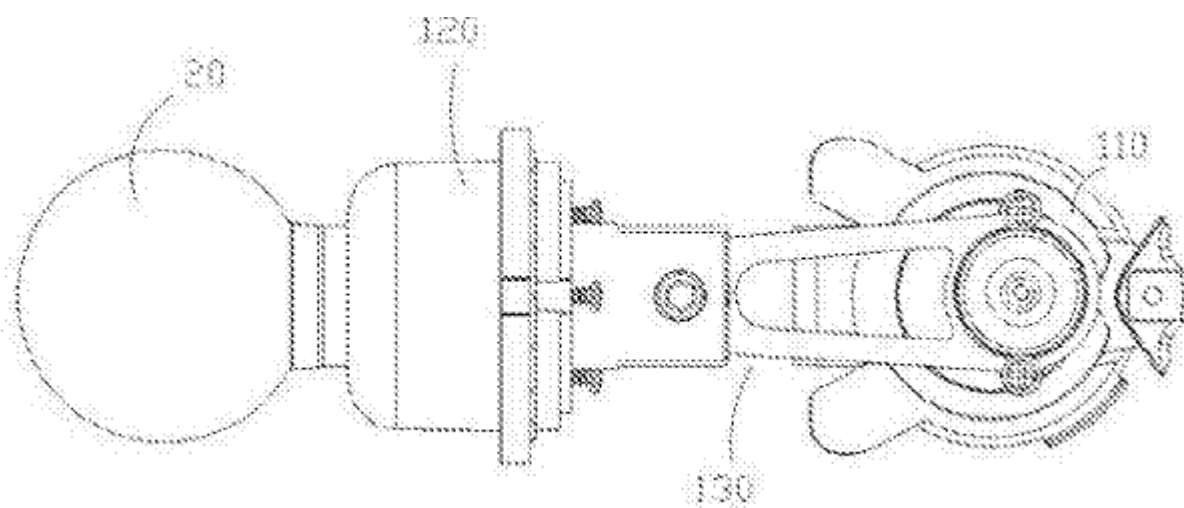


Figure 8

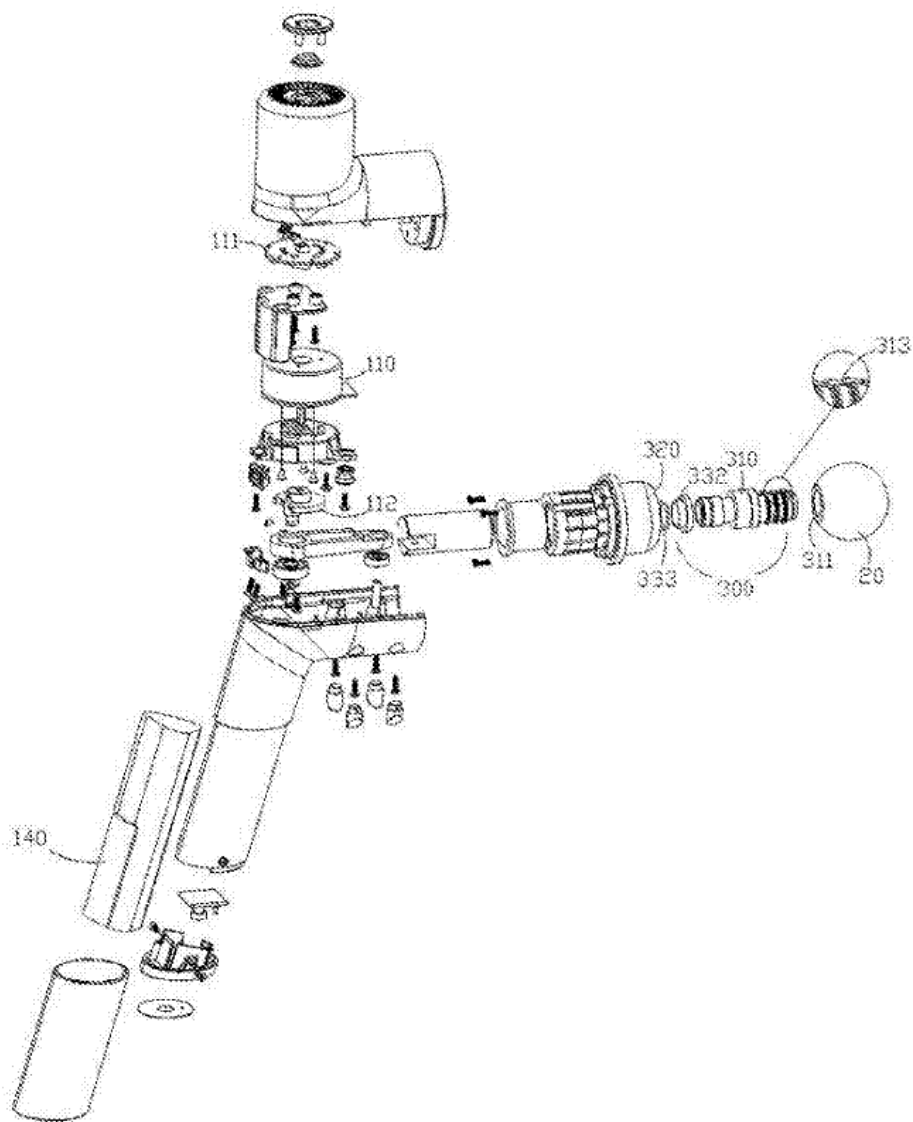


Figure 9

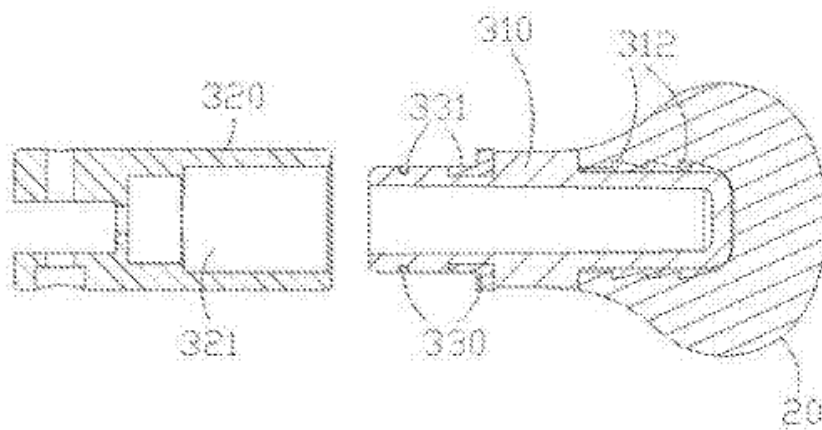


Figure 10