

(19) World Intellectual Property Organization,
International Bureau

(43) International Publication Date
7/23/2020 (23.07.2020)



(10) International Publication Number
WO 2020/147223 A1

(51) International patent classification:
A61H 7/00 (2006.01) *H05K 5/02* (2006.01)

(21) International application No.: PCT/CN2019/086962

(22) International application date: 5/15/2019 (15.05.2019)

(25) Language in application: Chinese

(26) Language in publication: Chinese

(30) Priority:
201910056372.9 1/18/2019 (18.01.2019) CN

(71) Applicant:
DONGGUAN XIQIN ELECTRICAL APPLIANCE CO., LTD. [CN/CN]: Huangyong Third Industrial Zone, Zhongtang Town, Dongguan City, Guangdong Province, China, 523075 (CN).

(72) Inventor: **Hu, Dashuai**; Huangyong Third Industrial Zone, Zhongtang Town, Dongguan City, Guangdong Province, China, 523075 (CN).

(74) Agent: **SHENGZHEN JAHONGBO INTELLECTUAL PROPERTY AGENT OFFICE**; Room 208, 2nd Floor, Tower A, Rongchao Yinglong Building, No. 5 Longfu Road, Longcheng Subdistrict, Longgang District, Shenzhen, Guangdong Province, China, 518172 (CN).

(81) Designated Countries (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX,

(54) Title: HANDHELD MUSCLE MASSAGER[

(54) HANDHELD MUSCLE MASSAGER

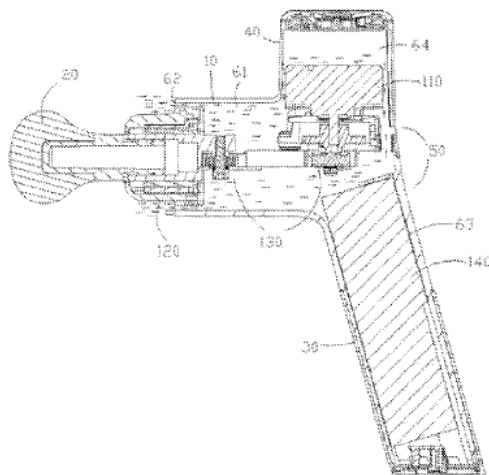


Figure 5

(57) Abstract: Provided is a handheld muscle massager, comprising a massage body (10), a massage head (20), a main holding handle (30) and a secondary holding handle (40), wherein the main holding handle (30) and the secondary holding handle (40) are simultaneously connected to a handle connecting end (12), the handheld muscle massager also comprises a driving motor (110), a piston type movement head (120) and a connecting rod assembly (130), the massage body (10) is provided with a body inner cavity (61) having a movement opening (62), the main holding handle (30) is provided with a main holding handle inner cavity (63), the secondary holding handle (40) is provided with a secondary holding handle inner cavity (64), the body inner cavity (61), the main holding handle inner cavity (63) and the secondary holding handle inner cavity (64) are communicated with one another to form a ventilation and heat dissipation passage.

(see next page)



MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated Countries (unless otherwise indicated, for every kind of national protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasia (AM, AZ, BY, KG, KZ, RU, TJ, TM), Europe (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

This International Publication:

- Includes the international search report (Article 21(3) of the Treaty).

(57) Abstract: Provided is a handheld muscle massager, comprising a massage body (10), a massage head (20), a main holding handle (30) and a secondary holding handle (40), wherein the main holding handle (30) and the secondary holding handle (40) are simultaneously connected to a handle connecting end (12), the handheld muscle massager also comprises a driving motor (110), a piston type movement head (120) and a connecting rod assembly (130), the massage body (10) is provided with a body inner cavity (61) having a movement opening (62), the main holding handle (30) is provided with a main holding handle inner cavity (63), the secondary holding handle (40) is provided with a secondary holding handle inner cavity (64), the body inner cavity (61), the main holding handle inner cavity (63) and the secondary holding handle inner cavity (64) are communicated with one another to form a ventilation and heat dissipation passage.

Handheld Muscle Massager

Technical field

The present invention relates to a massager, and particularly refers to a massager having a unique handheld manner and provided with a novel heat-dissipation structure.

Prior art

The massager is a new-generation health-care massage apparatus developed and designed on the basis of physics, bionics, bioelectricity, medicine, and many years of clinical practice. It utilizes a plurality of independent soft-touch massage heads, and can achieve the effects of relaxing muscles, soothing nerves, promoting blood circulation, enhancing cellular metabolism, and improving skin elasticity, and meanwhile it can also relieve fatigue, significantly reduce various chronic pain, acute pain, and muscle soreness, relax the body to reduce stress, and reduce skin wrinkles. Especially after people complete high-intensity muscle training, massage through the massager can greatly relieve human muscle soreness and repair muscle damage.

Among numerous massager products, handheld massagers are particularly widely used. As shown in Figures 1-2, two relatively typical handheld massagers are illustrated.

The handheld massager shown in Figure 1 mainly includes a body 1 and a handle 2, a massage head 3 being disposed at the front end of the body 1, and a motor, a battery, and other components being assembled in a concentrated manner in the body 1. During use, the user holds the handle 2 with one hand and presses the massage head 3 against the human body for massage. The handheld massager shown in Figure 1 still has many shortcomings during use, which are now described separately as follows. First, since during use the user can only hold the handle 2 with one hand to perform gripping and massaging, there inevitably exists a situation of insufficient gripping and pressing force, thereby affecting the massage effect. Second, since this type of massager has its main components all concentrated in the body 1, and the body 1 does not have a related heat-dissipation structure, overheating of the product often occurs during long-time use, thereby affecting product life and user experience.

Figure 2 shows a simplified handheld massager, in which a handle 4 and a body 5 are connected to form an integral structure. It also has the above-mentioned shortcomings of insufficient gripping and pressing force, poor massage effect, and unsatisfactory heat-dissipation performance.

It is worth emphasizing here that, to overcome the shortcoming of poor heat dissipation of massagers, traditional handheld massagers will form heat-dissipation holes in their bodies and handles to achieve ventilation and heat dissipation. However, in practice, most fitness users choose to use a massager to massage and relax muscle groups after intense exercise. At this time, a large amount of sweat remains on the user's body surface and palm area. The user's sweat often enters the massager through the heat-dissipation holes, thereby contaminating internal electronic components such as the motor, coil, and control board of the massager, resulting in failures such as short circuits and burnout, and also posing safety hazards.

Content of the invention

The present invention provides a handheld muscle massager, which includes a body, a massage head, and a driving rod, the body having an inner cavity and an opening, the opening being in communication with one end of the inner cavity, and a heat-dissipation airflow channel being formed at the opening. The present invention disposes the heat-dissipation airflow channel at the front end of the body, which can prevent sweat from entering the massager through heat-dissipation holes and contaminating internal electronic components such as the motor, coil, and control board of the massager, thereby avoiding failures such as short circuits and burnout, and eliminating safety hazards, and this is the main purpose of the present invention.

The present invention provides a handheld muscle massager, which includes a massage body, a massage head, a main holding handle, and a secondary holding handle, the massage body, the main holding handle, and the secondary holding handle being connected to form an integral structure. A smooth pressing and gripping surface is formed at the connection and intersection position of the massage body, the main holding handle, and the secondary holding handle. The user can grip the smooth pressing and gripping surface to perform downward pressing massage, and the user can also press downward with one hand on the smooth pressing and gripping surface to perform downward pressing massage. Through the design concept of the smooth pressing and gripping surface, the present invention avoids the structural design of a rear protruding boss at the rear end of a traditional massager, enabling the user's palm to comfortably press on the rear portion of the massager, improving the user experience while facilitating the user's application of force and enhancing the massage effect, and this is another purpose of the present invention.

The technical solution adopted by the present invention is as follows: A handheld muscle massager, which includes a massage body, a massage head, a main holding handle, and a secondary holding handle, wherein the massage body has a massage head mounting end and a handle connecting end, the massage head being mounted in the massage head mounting end, and the main holding handle and the secondary holding handle being simultaneously connected to the handle connecting end. The massage body, the main holding handle, and the secondary holding handle are connected to form an integral structure, and a smooth pressing and gripping surface is formed at the connection and intersection position of the massage body, the main holding handle, and the secondary holding handle, enabling the user to grip the smooth pressing and gripping surface to perform downward pressing massage.

A handheld muscle massager, which includes a body, a massage head, and a driving rod, the body having an inner cavity and an opening, the opening being in communication with one end of the inner cavity, the driving rod being disposed in the inner cavity, the massage head being connected to an end portion of the driving rod, and meanwhile, the massage head being located in the opening. The driving rod reciprocates and drives the massage head to reciprocate in the opening. A heat-dissipation airflow channel is formed at the opening, external air of the body being drawn into the inner cavity through the heat-dissipation airflow channel by the reciprocating movement of the driving rod and then discharged from the heat-dissipation airflow channel through the reciprocating movement of the driving rod.

The beneficial effects of the present invention are as follows: When the present invention is used, the user simultaneously grips the main holding handle and the secondary holding handle and presses the massage head against the human body for massage, and the user may also grip the main holding handle or the secondary holding handle with one hand to perform massage. Meanwhile, the user can grip the smooth pressing and gripping surface to perform downward pressing massage, and the user can also press downward with one hand on the smooth pressing and gripping surface to perform downward pressing massage. Through the design concept of the smooth pressing and gripping surface, the present invention avoids the structural design of a rear protruding boss at the rear end of a traditional massager, enabling the user's palm to comfortably press on the rear portion of the massager, improving the user experience while facilitating the user's application of force and enhancing the massage effect.

In addition, through the reciprocating movement of the piston type movement head, the present invention draws external air from the movement opening into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head pumps the external air out of the ventilation heat-dissipation passage, so as to achieve the effect of dissipating heat for each component in the ventilation heat-dissipation passage.

Meanwhile, the present invention has an adaptive adjustment structural gap at the connection position of the connecting rod assembly and the piston type movement head. When the driving motor drives the piston type movement head to move through the connecting rod assembly, first, the driving motor drives the connecting rod assembly to move, and at the same time, the connecting rod assembly drives the piston type movement head to move. At this moment, the driving force applied by the connecting rod assembly to the piston type movement head automatically adjusts the adaptive adjustment structural gap, enabling the connecting rod assembly and the piston type movement head to naturally adjust the positional relationship of the connection between the two by means of the driving force, thereby achieving a smoother overall transmission relationship and avoiding occurrences such as jamming and hard friction heating.

Brief description of the drawings

Figures 1-2 are structural schematic diagrams of a traditional massager.

Figure 3 is a three-dimensional structural schematic diagram of the present invention.

Figure 4 is a schematic diagram of the use state of the present invention.

Figure 5 is a heat-dissipation schematic diagram of ventilation heat-dissipation passage mode one of the present invention.

Figure 6 is a heat-dissipation schematic diagram of ventilation heat-dissipation passage mode two of the present invention.

Figure 7 is a sectional structural schematic diagram of the driving motor, the piston type movement head, and the connecting rod assembly of the present invention.

Figure 8 is a top view of the driving motor, the piston type movement head, and the connecting rod assembly of the present invention.

Figure 9 is a three-dimensional exploded schematic diagram of the present invention.

Figure 10 is a structural schematic diagram of the detachable connection unit of the present invention.

Figure 11 is a schematic diagram of the working principle of the heat-dissipation airflow channel of the present invention.

Figures 12-14 are positional schematic diagrams of embodiments of the heat-dissipation airflow channel of the present invention.

Figure 15 is a structural schematic diagram of the driving rod and the sleeve of the present invention.

Detailed description of embodiments

As shown in Figures 3 to 10, a handheld muscle massager includes a massage body 10, a massage head 20, a main holding handle 30, and a secondary holding handle 40.

As shown in Figures 3 to 4, the massage body 10 has a massage head mounting end 11 and a handle connecting end 12.

In specific implementation, the massage head mounting end 11 and the handle connecting end 12 are respectively located at the front and rear end portions of the massage body 10.

The massage head 20 is mounted in the massage head mounting end 11.

The main holding handle 30 and the secondary holding handle 40 are simultaneously connected to the handle connecting end 12, and the massage body 10, the main holding handle 30, and the secondary holding handle 40 are connected to form an integral structure.

As shown in Figure 4, during use, the user simultaneously grips the main holding handle 30 and the secondary holding handle 40 and presses the massage head 20 against the human body for massage. The user may also grip the main holding handle 30 or the secondary holding handle 40 with one hand to perform massage.

A smooth pressing and gripping surface 50 is formed at the connection and intersection position of the massage body 10, the main holding handle 30, and the secondary holding handle 40, enabling the user to grip the smooth pressing and gripping surface 50 to perform downward pressing massage, and enabling the user to press downward with one hand on the smooth pressing and gripping surface 50 to perform downward pressing massage.

Through the design concept of the smooth pressing and gripping surface 50, the present invention avoids the structural design of a rear protruding boss at the rear end of a traditional massager, enabling the user's palm to comfortably press on the rear portion of the massager, improving the user experience while facilitating the user's application of force and enhancing the massage effect.

A main included angle 51 is formed between the massage body 10 and the main holding handle 30, a secondary included angle 52 is formed between the massage body 10 and the secondary holding handle 40, and a handle included angle 53 is formed between the main holding handle 30 and the secondary holding handle 40.

In practice, the overall structure of the product may be specifically defined by changing the angles defining the above three included angles, and a preferred embodiment is described as follows.

The main included angle 51 is greater than ninety degrees and less than or equal to one hundred thirty-five degrees, the secondary included angle 52 is ninety degrees, and the handle included angle 53 is greater than one hundred thirty-five degrees and less than or equal to one hundred eighty degrees.

In specific implementation, the handle included angle 53 is equal to one hundred eighty degrees, and the smooth pressing and gripping surface 50 is a vertical surface, for example, an outer surface of a cylindrical body.

As shown in Figures 3 to 9, the handheld muscle massager further includes a driving motor 110, a piston type movement head 120, and a connecting rod assembly 130. The massage body 10 has a body inner cavity 61, and the body inner cavity 61 has a movement opening 62. The main holding handle 30 has a main holding handle inner cavity 63, and the secondary holding handle 40 has a secondary holding handle inner cavity 64.

The body inner cavity 61, the main holding handle inner cavity 63, and the secondary holding handle inner cavity 64 are in communication with one another to form a ventilation heat-dissipation passage.

The driving motor 110, the piston type movement head 120, and the connecting rod assembly 130 are simultaneously disposed in the ventilation heat-dissipation passage.

The massage head 20 is mounted on the piston type movement head 120, and the piston type movement head 120 is located in the movement opening 62.

The connecting rod assembly 130 is connected between the driving motor 110 and the piston type movement head 120, and the driving motor 110 drives the piston type movement head 120 to reciprocate at high speed in the movement opening 62 through the connecting rod assembly 130.

Through the reciprocating movement of the piston type movement head 120, external air is drawn from the movement opening 62 into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head 120 pumps the external air out of the ventilation heat-dissipation passage, so as to achieve the effect of dissipating heat for each component in the ventilation heat-dissipation passage.

In specific implementation, the handheld muscle massager further includes a battery assembly 140, and the battery assembly 140 is also disposed in the ventilation heat-dissipation passage.

In specific implementation, the driving motor 110 may be disposed in the main holding handle inner cavity 63 or the secondary holding handle inner cavity 64, and the battery assembly 140 may also be disposed in the main holding handle inner cavity 63 or the secondary holding handle inner cavity 64, while the piston type movement head 120 and the connecting rod assembly 130 are disposed in the body inner cavity 61.

In specific implementation, ventilation and heat dissipation using the ventilation heat-dissipation passage may be performed through the following specific modes.

As shown in Figure 5, in mode one, the movement opening 62 simultaneously serves as the air inlet and the air outlet of the ventilation heat-dissipation passage. Through the reciprocating movement of the piston type movement head 120, external air is drawn from the movement opening 62 into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head 120 pumps the external air out from the movement opening 62 again, so as to achieve the effect of dissipating heat for each component in the ventilation heat-dissipation passage.

As shown in Figure 6, in mode two, the movement opening 62 serves as the air inlet of the ventilation heat-dissipation passage, and the ventilation heat-dissipation passage has an air outlet 65, the air outlet 65 being disposed on the main holding handle 30 or the secondary holding handle 40.

Through the reciprocating movement of the piston type movement head 120, external air is drawn from the movement opening 62 into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head 120 pumps the external air out from the air outlet 65, so as to achieve the effect of dissipating heat for each component in the ventilation heat-dissipation passage.

In specific implementation, the air outlet 65 is disposed at the top of the secondary holding handle 40, and the driving motor 110 is disposed in the secondary holding handle inner cavity 64, so that the ventilation heat-dissipation passage mainly dissipates heat for the driving motor 110.

Meanwhile, a main circuit board 111 is also disposed in the secondary holding handle inner cavity 64, and in a preferred embodiment, the main circuit board 111 is disposed above the driving motor 110 and fixedly connected below the air outlet 65.

In mode three, the movement opening 62 serves as the air inlet of the ventilation heat-dissipation passage, and the ventilation heat-dissipation passage has an air outlet 65, the air outlet 65 being simultaneously disposed on the main holding handle 30 and the secondary holding handle 40.

Through the reciprocating movement of the piston type movement head 120, external air is drawn from the movement opening 62 into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head 120 pumps the external air out from the air outlet 65, so as to achieve the effect of dissipating heat for each component in the ventilation heat-dissipation passage.

In specific implementation, a preferred embodiment is that the air outlet 65 is disposed at the top of the secondary holding handle 40, and meanwhile, the air outlet 65 is also disposed on one side of the main holding handle 30.

The air outlet 65 may also be disposed at the top of the secondary holding handle 40, and meanwhile, the air outlet 65 may be disposed at the bottom end of the main holding handle 30.

The air outlet 65 may further be simultaneously disposed on the side surfaces of both the main holding handle 30 and the secondary holding handle 40.

In modes one, two, and three, the driving motor 110 and the battery assembly 140 may be respectively disposed in the main holding handle 30 and the secondary holding handle 40, and the driving motor 110 and the battery assembly 140 may also be simultaneously disposed in the main holding handle 30 or the secondary holding handle 40.

As shown in Figures 7 to 8, in specific implementation, the connecting rod assembly 130 is connected between the driving motor 110 and the piston type movement head 120, and the driving motor 110 drives the piston type movement head 120 to reciprocate at high speed in the movement opening 62 through the connecting rod assembly 130.

An adaptive adjustment structural gap 200 is provided at the connection position of the connecting rod assembly 130 and the piston type movement head 120.

When the driving motor 110 drives the piston type movement head 120 to move through the connecting rod assembly 130, first, the driving motor 110 drives the connecting rod assembly 130 to move, and at the same time, the connecting rod assembly 130 drives the piston type movement head 120 to move. At this moment, the driving force applied by the connecting rod assembly 130 to the piston type movement head 120 automatically adjusts the adaptive adjustment structural gap 200, enabling the connecting rod assembly 130 and the piston type movement head 120 to naturally adjust the positional relationship of the connection between the two by means of the driving force, thereby achieving a smoother overall transmission relationship and avoiding occurrences such as jamming and hard friction heating.

In practice, if the adaptive adjustment structural gap 200 does not exist, the connecting rod assembly 130 and the piston type movement head 120 must be fixedly locked together. At this moment, if there is even a slight assembly error during assembly, hard friction caused by an unsmooth transmission relationship will inevitably occur, thereby generating extremely high operating noise that affects the user experience and greatly reduces product life.

In specific implementation, a cam 112 is sleeved on an output shaft of the driving motor 110, and 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 in the piston type movement head 120. The adaptive adjustment structural gap 200 is located at the position where the rigid connecting rod is pivotally connected to the piston type movement head 120.

In practice, one end of the piston type movement head 120 is provided with a pivot slot 121, the rigid connecting rod is inserted into the pivot slot 121, and a pivot bolt 122 pivotally connects the rigid connecting rod in the pivot slot 121.

The adaptive adjustment structural gap 200 is simultaneously located between the top surface of the rigid connecting rod and the top surface of the pivot slot 121, and between the bottom surface of the rigid connecting rod and the bottom surface of the pivot slot 121.

As shown in Figures 9 to 10, in specific implementation, the massage head 20 is mounted on the piston type movement head 120 through a detachable connection unit 300.

In practice, the massage head 20 may be a massage head of various shapes.

The detachable connection unit 300 includes a convenient plug 310, and the massage head 20 is detachably mounted on the convenient plug 310, wherein the massage head 20 has a detachment slot 311, and a plurality of snap rings 312 are annularly disposed on the convenient plug 310.

When the convenient plug 310 is inserted into the detachment slot 311, the plurality of snap rings 312 fix the longitudinal relative position between the massage head 20 and the convenient plug 310, so that the massage head 20 does not easily fall off from the convenient plug 310.

Along the longitudinal direction of the convenient plug 310, a positioning groove 313 is recessed on the outer surface of the convenient plug 310. Through the positioning groove 313, the transverse relative position between the massage head 20 and the convenient plug 310 can be fixed, so that the massage head 20 does not rotate on the convenient plug 310, thereby improving the user experience.

The detachable connection unit 300 further includes a front connection nozzle 320, and the convenient plug 310 is inserted into the front connection nozzle 320. An insertion hole 321 is provided in the front connection nozzle 320, and the convenient plug 310 is inserted into the insertion hole 321.

A connection sleeve assembly 330 is sleeved on the convenient plug 310, and the connection sleeve assembly 330 is located between the convenient plug 310 and the insertion hole 321.

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

The smooth-surface outer connection surface 331 fits against the smooth-surface inner wall to form a vacuum connection relationship, thereby improving the stability of the convenient plug 310 inserted in the front connection nozzle 320.

In specific implementation, the connection sleeve assembly 330 includes a connection sleeve 332 and a connection ring 333, and the outer surface of the connection sleeve 332 and the outer surface of the connection ring 333 together form the smooth-surface outer connection surface 331.

As shown in Figures 11 to 15, a handheld muscle massager includes a body 510, a massage head 520, and a driving rod 530, wherein the body 510 has an inner cavity 511 and an opening 512, and the opening 512 is in communication with one end of the inner cavity 511.

The driving rod 530 is disposed in the inner cavity 511, the massage head 520 is connected to an end portion of the driving rod 530, and meanwhile, the massage head 520 is located in the opening 512.

The driving rod 530 reciprocates and drives the massage head 520 to reciprocate in the opening 512, thereby achieving the effect of repeatedly striking the human body with the massage head 520 to perform human muscle massage.

A heat-dissipation airflow channel 600 is formed at the opening 512.

External air of the body 510 is drawn into the inner cavity 511 through the heat-dissipation airflow channel 600 by the reciprocating movement of the driving rod 530, and then discharged from the heat-dissipation airflow channel 600 through the reciprocating movement of the driving rod 530, thereby realizing circulating airflow and achieving ventilation and heat dissipation for components in the inner cavity 511 of the body 510.

In practice, most fitness users choose to use a massager to massage and relax muscle groups after intense exercise. At this time, a large amount of sweat remains on the user's body surface and palm area. The present invention disposes the heat-dissipation airflow channel 600 at the front end of the body 510, which can prevent sweat from entering the massager through heat-dissipation holes and contaminating internal electronic components such as the motor, coil, and control board of the massager, thereby avoiding failures such as short circuits and burnout, and eliminating safety hazards.

In specific implementation, an assisted air-intake and air-exhaust structure is provided on the driving rod 530. Through the assisted air-intake and air-exhaust structure, the air-intake and air-exhaust efficiency of the driving rod 530 can be improved, the airflow speed in the heat-dissipation airflow channel 600 and the inner cavity 511 can be increased, and the heat-dissipation effect can be enhanced.

In practice, multiple embodiments may support the function of the assisted air-intake and air-exhaust structure, which are now described separately as follows.

As shown in Figure 15, the assisted air-intake and air-exhaust structure may be a plurality of blades 531, and the plurality of blades 531 are divided into intake blades and exhaust blades. When the driving rod 530 moves inward and drives the massage head 520 to move inward, the intake blades can improve the air-intake efficiency of the driving rod 530. When the driving rod 530 moves outward and drives the massage head 520 to move outward, the exhaust blades can improve the air-exhaust efficiency of the driving rod 530.

The assisted air-intake and air-exhaust structure may also be a fin structure, a vane structure, a protruding-piece structure, a boss structure, and so on.

The assisted air-intake and air-exhaust structure may further be an airflow groove structure, a hole structure, and so on.

In specific implementation, the driving rod 530 performs forward and backward reciprocating movement in the inner cavity 511.

In specific implementation, the driving rod 530 is driven to reciprocate by a motor 550, and the driving rod 530 may also be driven by other driving devices, such as pneumatic cylinders, hydraulic cylinders, and so on.

In specific implementation, components such as a battery and a control circuit board are simultaneously disposed in the inner cavity 511.

In specific implementation, multiple embodiments may form the heat-dissipation airflow channel 600, as shown in Figures 11-14.

As shown in Figure 15, in specific implementation, a sleeve 540 is connected to the front end of the driving rod 530, and the massage head 520 is detachably inserted into the sleeve 540. During use, different massage heads 520 may be selected and inserted into the sleeve 540 as needed to achieve different massage effects. An exhaust hole 541 is formed on the sleeve 540. When the massage head 520 is inserted into the sleeve 540, the air in the sleeve 540 can be discharged through the exhaust hole 541, thereby facilitating installation and removal of the massage head 520.

Claims

1. A handheld muscle massager, characterized in that: it includes a massage body (10), a massage head (20), a main holding handle (30), and a secondary holding handle (40), wherein the massage body (10) has a massage head mounting end (11) and a handle connecting end (12), the massage head (20) being mounted in the massage head mounting end (11), and the main holding handle (30) and the secondary holding handle (40) being simultaneously connected to the handle connecting end (12). The massage body (10), the main holding handle (30), and the secondary holding handle (40) are connected to form an integral structure, and a smooth pressing and gripping surface (50) is formed at the connection and intersection position of the massage body (10), the main holding handle (30), and the secondary holding handle (40), enabling the user to grip the smooth pressing and gripping surface (50) to perform downward pressing massage.

2. The handheld muscle massager according to claim 1, characterized in that: the handheld muscle massager further includes a driving motor (110), a piston type movement head (120), and a connecting rod assembly (130). The massage body (10) has a body inner cavity (61), and the body inner cavity (61) has a movement opening (62). The main holding handle (30) has a main holding handle inner cavity (63), and the secondary holding handle (40) has a secondary holding handle inner cavity (64). The body inner cavity (61), the main holding handle inner cavity (63), and the secondary holding handle inner cavity (64) are in communication with one another to form a ventilation heat-dissipation passage.

The driving motor (110), the piston type movement head (120), and the connecting rod assembly (130) are simultaneously disposed in the ventilation heat-dissipation passage. The massage head (20) is mounted on the piston type movement head (120), and the piston type movement head (120) is located in the movement opening (62).

The connecting rod assembly (130) is connected between the driving motor (110) and the piston type movement head (120), and the driving motor (110) drives the piston type movement head (120) to reciprocate in the movement opening (62) through the connecting rod assembly (130).

Through the reciprocating movement of the piston type movement head (120), external air is drawn from the movement opening (62) into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head (120) pumps the external air out of the ventilation heat-dissipation passage.

3. The handheld muscle massager according to claim 2, characterized in that: the handheld muscle massager further includes a battery assembly (140), and the battery assembly (140) is also disposed in the ventilation heat-dissipation passage.

4. The handheld muscle massager according to claim 2, characterized in that: the movement opening (62) simultaneously serves as the air inlet and the air outlet of the ventilation heat-dissipation passage. Through the reciprocating movement of the piston type movement head (120), external air is drawn from the movement opening (62) into the ventilation heat-dissipation passage, and then, after the external air absorbs heat in the ventilation heat-dissipation passage, the reciprocating movement of the piston type movement head (120) pumps the external air out from the movement opening (62) again.

5. The handheld muscle massager according to claim 2 or claim 4, characterized in that: an adaptive adjustment structural gap (200) is provided at the connection position of the connecting rod assembly (130) and the piston type movement head (120).

When the driving motor (110) drives the piston type movement head (120) to move through the connecting rod assembly (130), first, the driving motor (110) drives the connecting rod assembly (130) to move, and at the same time, the connecting rod assembly (130) drives the piston type movement head (120) to move. At this moment, the driving force applied by the connecting rod assembly (130) to the piston type movement head (120) automatically adjusts the adaptive adjustment structural gap (200), enabling the connecting rod assembly (130) and the piston type movement head (120) to adjust the positional relationship of the connection between the two by means of the driving force.

6. The handheld muscle massager according to claim 5, characterized in that: a cam (112) is sleeved on an output shaft of the driving 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 in the piston type movement head (120). The adaptive adjustment structural gap (200) is located at the position where the rigid connecting rod is pivotally connected to the piston type movement head (120).

One end of the piston type movement head (120) is provided with a pivot slot (121), the rigid connecting rod is inserted into the pivot slot (121), and a pivot bolt (122) pivotally connects the rigid connecting rod in the pivot slot (121).

The adaptive adjustment structural gap (200) is simultaneously located between the top surface of the rigid connecting rod and the top surface of the pivot slot (121), and between the bottom surface of the rigid connecting rod and the bottom surface of the pivot slot (121).

7. The handheld muscle massager according to claim 2 or claim 4, characterized in that: the massage head (20) is mounted on the piston type movement head (120) through a detachable connection unit (300).

The detachable connection unit (300) includes a convenient plug (310), and the massage head (20) is detachably mounted on the convenient plug (310), wherein the massage head (20) has a detachment slot (311), and a plurality of snap rings (312) are annularly disposed on the convenient plug (310).

When the convenient plug (310) is inserted into the detachment slot (311), the plurality of snap rings (312) fix the longitudinal relative position between the massage head (20) and the convenient plug (310).

Along the longitudinal direction of the convenient plug (310), a positioning groove (313) is recessed on the outer surface of the convenient plug (310). Through the positioning groove (313), the transverse relative position between the massage head (20) and the convenient plug (310) can be fixed, so that the massage head (20) does not rotate on the convenient plug (310).

8. A handheld muscle massager, comprising a body (510), a massage head (520), and a driving rod (530), characterized in that:

The body (510) has an inner cavity (511) and an opening (512), and the opening (512) is in communication with one end of the inner cavity (511). The driving rod (530) is disposed in the inner cavity (511), the massage head (520) is connected to an end portion of the driving rod (530), and meanwhile, the massage head (520) is located in the opening (512). The driving rod (530) reciprocates and drives the massage head (520) to reciprocate in the opening (512), and a heat-dissipation airflow channel (600) is formed at the opening (512).

External air of the body (510) is drawn into the inner cavity (511) through the heat-dissipation airflow channel (600) by the reciprocating movement of the driving rod (530), and then discharged from the heat-dissipation airflow channel (600) through the reciprocating movement of the driving rod (530).

9. The handheld muscle massager according to claim 8, characterized in that: an assisted air-intake and air-exhaust structure is provided on the driving rod (530).

10. The handheld muscle massager according to claim 8, characterized in that: a sleeve (540) is connected to the front end of the driving rod (530), the massage head (520) is detachably inserted into the sleeve (540), and an exhaust hole 541 is formed on the sleeve (540).

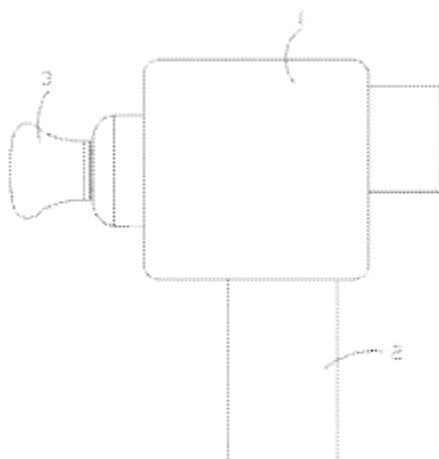


Figure 1



Figure 2

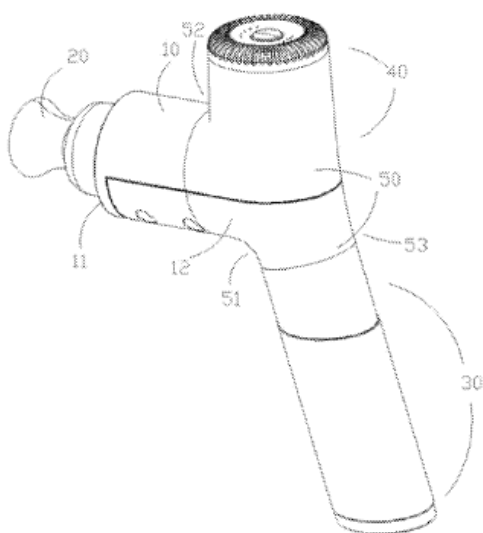


Figure 3



Figure 4

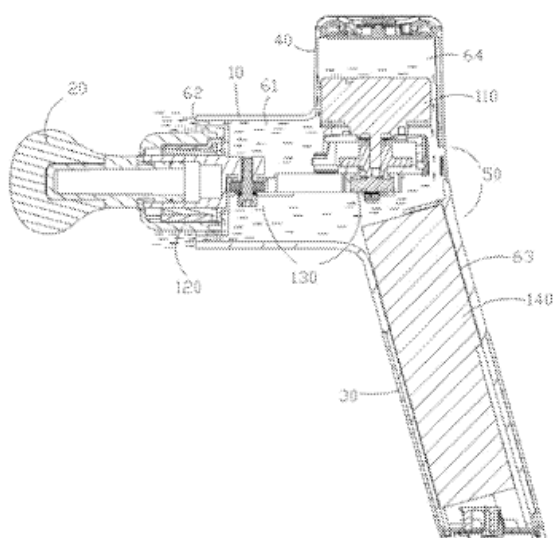


Figure 5

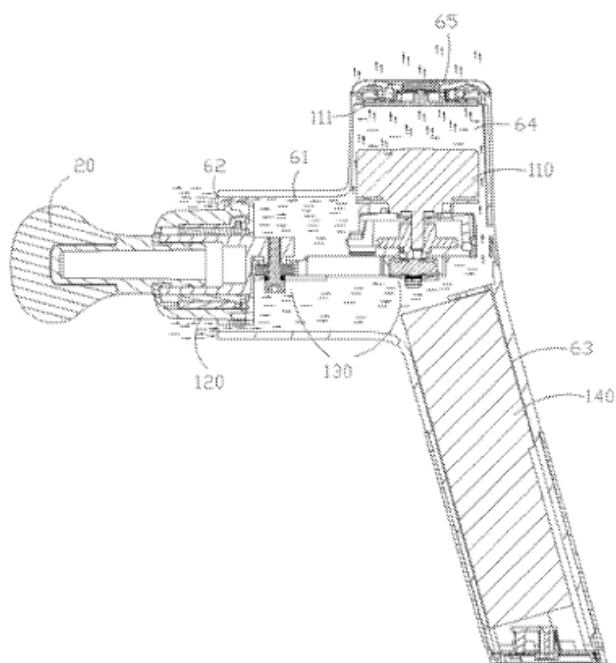


Figure 6

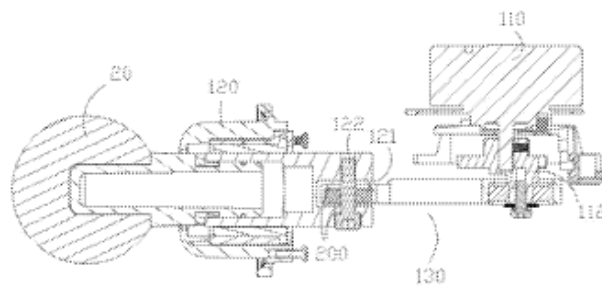


Figure 7

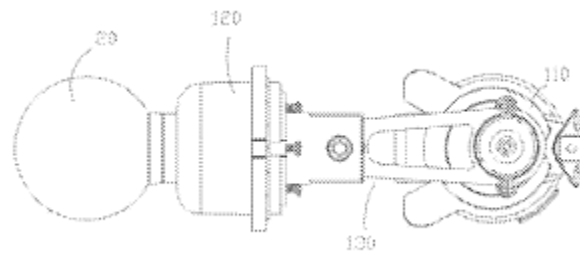


Figure 8

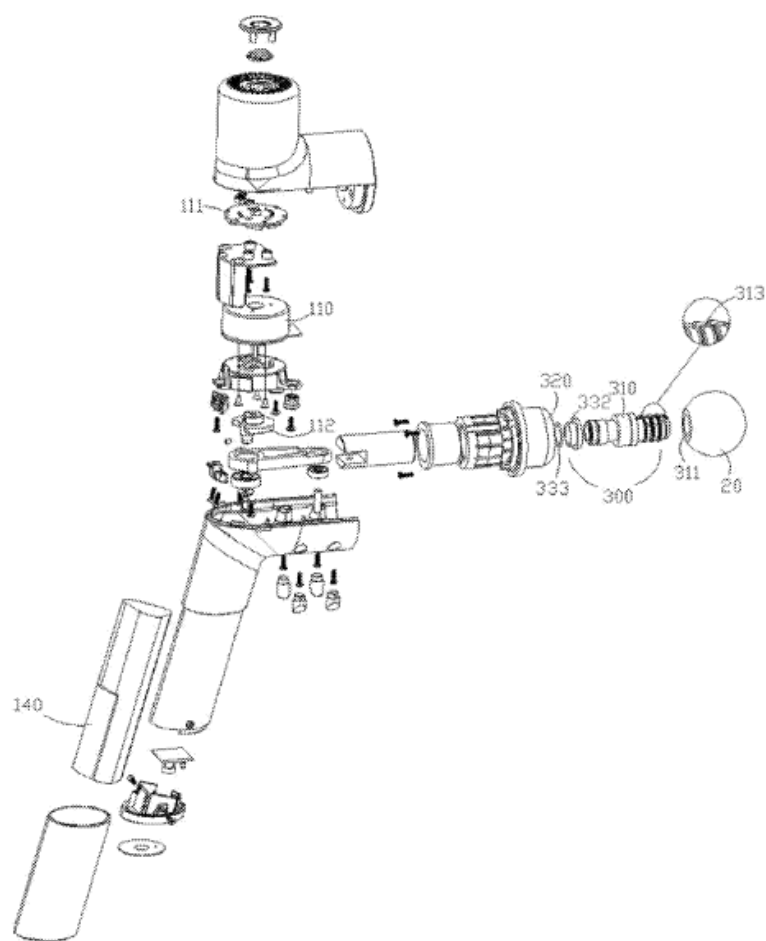


Figure 9

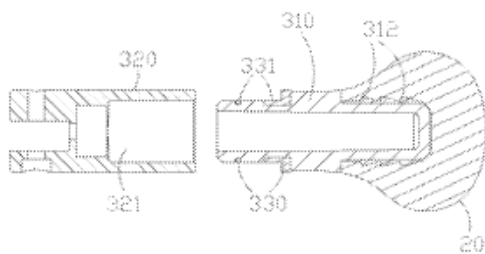


Figure 10

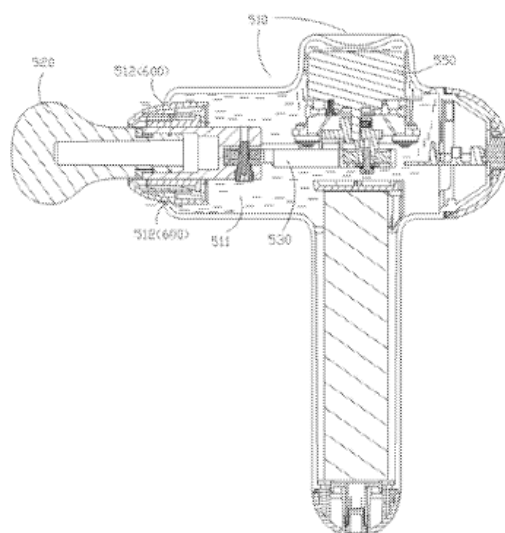


Figure 11

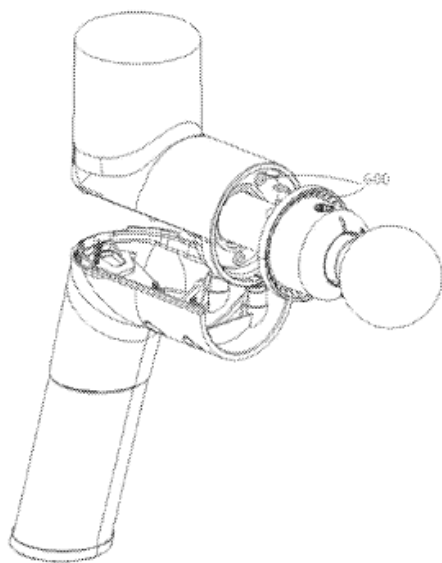


Figure 12

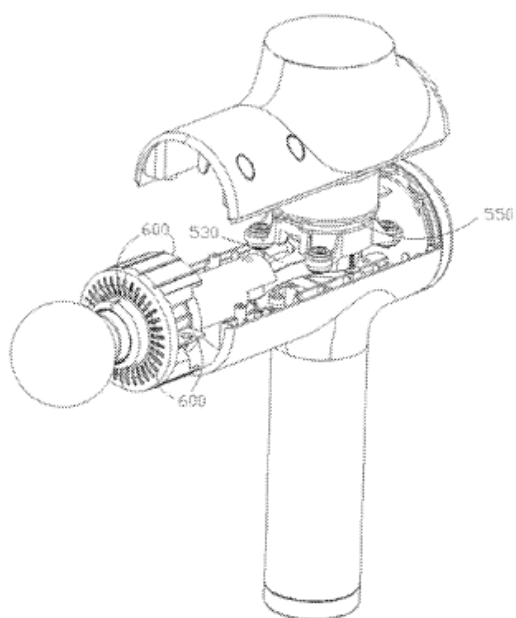


Figure 13

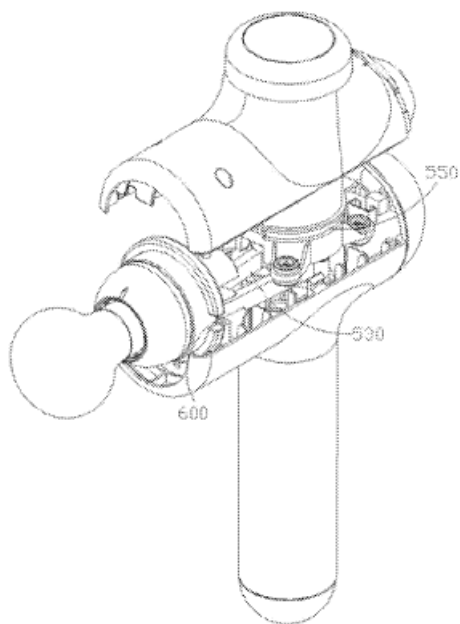


Figure 14

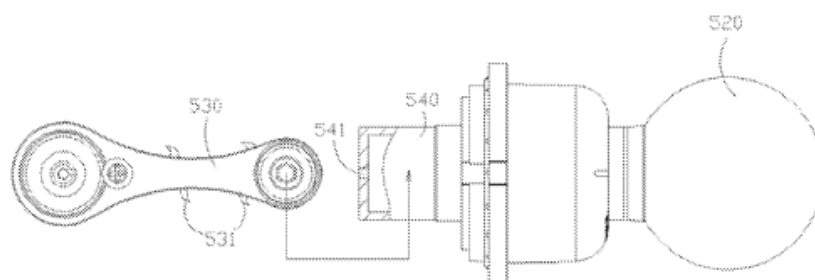


Figure 15

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/086962

A. CLASSIFICATION OF SUBJECT MATTER

A61H 7/00(2006.01)i; H05K 5/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61H H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, WPI, EPODOC, CNKI: 东莞市西芹电器有限公司, 按摩仪, 按摩器, 按摩, 手持, 手握, 按摩头, 内腔, 压, 下压, 伸缩, 反复, 往复, 运动, 肌肉, 副, 上, 手柄, 散热, massager, massage, heat, reject+, loss, ventilat+, hand, hold, held

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 2294049 Y (LV, Duxian) 14 October 1998 (1998-10-14) page 3, line 8 to page 4, line 14, and figures 1 and 2	1
Y	CN 2595360 Y (PUYUAN SCIENCE AND TECHNOLOGY CO., LTD., GUANGZHOU CITY) 31 December 2003 (2003-12-31) description, page 2, line 25 to page 4, line 4, and figure 1	1
A	CN 205814637 U (LUO, Yongzhen) 21 December 2016 (2016-12-21) entire document	1-10
A	CN 204684443 U (LIU, Yongfeng) 07 October 2015 (2015-10-07) entire document	1-10
A	CN 203017348 U (SHI, Weili) 26 June 2013 (2013-06-26) entire document	1-10
A	CN 2540948 Y (DONG, Jun) 26 March 2003 (2003-03-26) entire document	1-10
A	CN 205885777 U (CHONGQING EASY CONTROL TECH CO., LTD.) 18 January 2017 (2017-01-18) entire document	1-10

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 September 2019

Date of mailing of the international search report

15 October 2019

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Facsimile No. (86-10)62019451

Authorized officer

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/086962

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category ^{a)}	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 8777881 B2 (CAL, Mingwei) 15 July 2014 (2014-07-15) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/086962

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	2294049	Y	14 October 1998	None			
CN	2595360	Y	31 December 2003	None			
CN	205814637	U	21 December 2016	None			
CN	204684443	U	07 October 2015	None			
CN	203017348	U	26 June 2013	None			
CN	2540948	Y	26 March 2003	None			
CN	205885777	U	18 January 2017	None			
US	8777881	B2	15 July 2014	US	2010145242	A1	10 June 2010

Form PCT/ISA/210 (patent family annex) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/086962

A. CLASSIFICATION OF SUBJECT MATTER

A61H 7/00(2006.01)i; H05K 5/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61H H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, WPI, EPODOC, CNKI: 东莞市西芹电器有限公司, 按摩仪, 按摩器, 按摩, 手持, 手握, 按摩头, 内腔, 压, 下压, 伸缩, 反复, 往复, 运动, 肌肉, 副, 上, 手柄, 散热, massager, massage, heat, reject+, loss, ventilat+, hand, hold, held

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 2294049 Y (LV, Duxian) 14 October 1998 (1998-10-14) page 3, line 8 to page 4, line 14, and figures 1 and 2	1
Y	CN 2595360 Y (PUYUAN SCIENCE AND TECHNOLOGY CO., LTD., GUANGZHOU CITY) 31 December 2003 (2003-12-31) description, page 2, line 25 to page 4, line 4, and figure 1	1
A	CN 205814637 U (LUO, Yongzhen) 21 December 2016 (2016-12-21) entire document	1-10
A	CN 204684443 U (LIU, Yongfeng) 07 October 2015 (2015-10-07) entire document	1-10
A	CN 203017348 U (SHI, Weili) 26 June 2013 (2013-06-26) entire document	1-10
A	CN 2540948 Y (DONG, Jun) 26 March 2003 (2003-03-26) entire document	1-10
A	CN 205885777 U (CHONGQING EASY CONTROL TECH CO., LTD.) 18 January 2017 (2017-01-18) entire document	1-10

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

27 September 2019

Date of mailing of the international search report

15 October 2019

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/086962**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 8777881 B2 (CAL, Mingwei) 15 July 2014 (2014-07-15) entire document	1-10

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/086962

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	2294049	Y	14 October 1998	None			
CN	2595360	Y	31 December 2003	None			
CN	205814637	U	21 December 2016	None			
CN	204684443	U	07 October 2015	None			
CN	203017348	U	26 June 2013	None			
CN	2540948	Y	26 March 2003	None			
CN	205885777	U	18 January 2017	None			
US	8777881	B2	15 July 2014	US	2010145242	A1	10 June 2010

Form PCT/ISA/210 (patent family annex) (January 2015)