

SPECIFICATION

TITLE OF THE INVENTION: ATTACHMENT ATTACHABLE TO MASSAGE MACHINE
AND PERCUSSION MASSAGE MACHINE INCLUDING ATTACHMENT

TECHNICAL FIELD

[0001]

The present disclosure relates to a percussion massage machine that performs a percussion massage on a treatment target site of a user, and particularly to an attachment (accessory) for a percussion massage machine, the attachment being capable of changing amplitude or a moving direction of a percussion element of the percussion massage machine.

The present application claims priority to Japanese Patent Application No. 2023-151337 filed on September 19, 2023, the entire disclosure of which is hereby incorporated by reference.

BACKGROUND ART

[0002]

A massage machine suitable for performing a tapping massage on a treatment target site, particularly a handheld massage machine that is holdable by a user and is configured to apply percussion to a treatment target site has already been commercially available.

[0003]

A massage machine of this type typically includes a grip portion and a percussion element (tapping massage member) located on a distal end, a side surface, or the like of the grip portion so as to protrude away from or retract toward the distal end. In addition, a drive motor that serves as a drive source for the percussion element and a protrusion and retraction conversion mechanism that converts rotating motion of an output shaft of the drive motor into protruding and retracting motion of the percussion element are incorporated in a main body of

the massage machine (see Patent Literature 1 and Non Patent Literature 1).

CITATION LIST

[PATENT LITERATURE]

[0004]

PATENT LITERATURE 1: JP 2002-282322 A

[NON PATENT LITERATURE]

[0005]

NON PATENT LITERATURE 1: EXAGUN HYPER (REG-04BK) manufactured by Dream Factory Inc., <https://www.dr-air.com/jp/ja/products/exagun-hyper/>

SUMMARY OF THE INVENTION

[0006]

An attachment for a massage machine according to an aspect of the present disclosure is an attachment attachable to a massage machine including a reciprocating body configured to transmit reciprocating motion for performing a tapping massage on a treatment target site of a user, the attachment including: a treating body configured to move differently from the reciprocating body; and a conversion mechanism configured to convert movement of the reciprocating body into movement of the treating body.

BRIEF DESCRIPTION OF DRAWINGS

[0007]

FIG. 1 is a frontward perspective view illustrating an attachment according to a first embodiment and a massage machine main body to which this attachment is attachable.

FIG. 2 is a frontward perspective view illustrating the massage machine main body with

the attachment according to the first embodiment attached thereto.

FIG. 3 is a frontward perspective view illustrating an internal structure of the attachment according to the first embodiment.

FIG. 4 is a sectional view illustrating the internal structure of the attachment according to the first embodiment and movement of the attachment.

FIG. 5 is a frontward perspective view illustrating an attachment according to a second embodiment and a massage machine main body to which this attachment is attachable.

FIG. 6 is a frontward perspective view illustrating the massage machine main body with the attachment according to the second embodiment attached thereto.

FIG. 7 is a frontward perspective view illustrating an internal structure of the attachment according to the second embodiment.

FIG. 8 is a sectional view illustrating the internal structure of the attachment according to the second embodiment and movement of the attachment.

FIG. 9 is a downward perspective view illustrating an internal structure of the massage machine main body.

DETAILED DESCRIPTION

[0008]

<Problems to be solved by the present disclosure>

The conventional massage machine (percussion massage machine) described above is capable of performing a comfortable tapping massage on a stiff affected part, a site where fatigue has been accumulated, or the like. However, if a user is slim and has a less muscular body, vibrations by percussion propagate through the user's bones or internal organs. Consequently, the massage is occasionally too strong depending on a user.

[0009]

In view of this, for example, it is conceivable to develop a massage machine including a percussion element with small protrusion and retraction amplitude. However, the percussion massage machine with small protrusion and retraction amplitude is conversely insufficient for a user who desires strong stimulation in order to massage a stiff treatment target site.

[0010]

In addition, some percussion massage machines include a mechanism that causes a percussion element to apply vibrations by percussion to a treatment target site. However, massage machines need to meet various user requests. This percussion massage machine is also required to perform “a massage that repeatedly grabs and releases a treatment target site” in some cases. The massage machines disclosed in the citations list fail to meet the foregoing requests.

[0011]

In order to meet the various requests, it is conceivable to attach to a percussion massage machine an attachment (accessory) that changes the protrusion and retraction amplitude of a percussion element and makes the protruding and retracting direction of the percussion element changeable.

[0012]

The present disclosure has been made in view of the circumstances described above. An object of the present disclosure is to provide an attachment (an attachment for a percussion massage machine) that changes the protrusion and retraction amplitude of a percussion element and makes the protruding and retracting direction of the percussion element changeable in such a manner that a location where the percussion element protrudes and retracts is covered with the attachment like a cap.

[0013]

<Advantageous effect of the present disclosure>

By attaching an attachment of the present disclosure to a location, where a reciprocating body protrudes and retracts, of a percussion massage machine, it is possible to change the protrusion and retraction amplitude of the reciprocating body and make the protruding and retracting direction of a treatment element that performs treatment changeable. It is thus possible to meet requests of users who have various needs.

[0014]

<Outline of embodiments of the present disclosure>

An outline of below-listed embodiments of the present disclosure is described.

[0015]

In order to achieve the foregoing object, the present disclosure takes the following technical measures.

[0016]

(1) An attachment according to the present disclosure is an attachment attachable to a massage machine including a reciprocating body configured to transmit reciprocating motion for performing a tapping massage on a treatment target site of a user, the attachment including: a treating body configured to move differently from the reciprocating body; and a conversion mechanism configured to convert movement of the reciprocating body into movement of the treating body.

[0017]

(2) In (1) described above, the reciprocating body may reciprocate so as to freely protrude outward and retract inward, the treating body may freely protrude outward and retract inward so as to perform the tapping massage on the treatment target site of the user, and the conversion mechanism may reduce amplitude in protrusion and retraction of the reciprocating body to convert the reduced amplitude into amplitude of the treating body.

[0018]

(3) In (1) described above, the reciprocating body may reciprocate so as to freely protrude outward and retract inward, and the conversion mechanism may convert a moving direction of the treating body into a direction intersecting with a protruding and retracting direction of the reciprocating body.

[0019]

(4) In (2) described above, the conversion mechanism may include a lever portion having one end or a middle that is pivotally supported so as to freely turn in a protruding and retracting direction of the reciprocating body, the reciprocating body may engage with one end of the lever member in a turning direction of the lever member, the treating body may engage with another end of the lever member in the turning direction, and with regard to a distance SB from a pivot axial center of the lever portion to an engagement position of the reciprocating body and an engagement position SF from the pivot axial center of the lever member to the treating body, the distance SB and the distance SF may be different from each other.

[0020]

(5) In (4) described above, the distance SF may be shorter than the distance SB so that protrusion and retraction amplitude of the reciprocating body is reduced and converted into protrusion and retraction amplitude of the treating body.

[0021]

(6) In (3) described above, the conversion mechanism the conversion mechanism may include: a plurality of arm members; and an engagement member with which the reciprocating body engages, a plurality of the treating bodies may be disposed on distal ends of the arm members, and the reciprocating body may push the engagement member forward or pull the engagement member rearward to separate or bring proximal ends of the arm members from or close to each other and to bring or separate the distal ends of the arm members close to or from each other.

[0022]

(7) In (3) described above, the conversion mechanism may include: a plurality of arm members; an engagement member with which the reciprocating body engages; and a plurality of coupling members configured to couple the corresponding arm members and the engagement member together, a plurality of the treating bodies may be disposed on distal ends of the arm members, a proximal end of each arm member may engage with the engagement member via the corresponding coupling member such that the distal end and the proximal end of the arm member move in a form of a seesaw with a middle of the arm member pivotally supported so as to freely turn, and the reciprocating body may push the engagement member forward to separate the proximal ends of the arm members from each other and bring the distal ends of the arm members close to each other via the coupling members.

[0023]

(8) In (6) described above, the arm members may be provided at equal intervals around an axial center of the reciprocating body in a moving direction of the reciprocating body.

[0024]

(9) In (7) described above, the arm members may be provided at equal intervals around an axial center of the reciprocating body in a moving direction of the reciprocating body.

[0025]

(10) In any one of (1) to (9) described above, a first treatment element configured to perform the tapping massage on the treatment target site of the user may be attachable to the reciprocating body, and the treating body may serve as a second treatment element configured to move for performing a massage on the treatment target site of the user.

[0026]

(11) A percussion massage machine according to the present disclosure may include: a main body; a reciprocating body configured to protrude away from and to retract toward the

main body to perform a tapping massage on a treatment target site of a user; and the foregoing attachment attachable to the main body so as to cover the reciprocating body.

[0027]

(12) In (11) described above, a detection sensor may be disposed on each of or one of the main body and the attachment to detect that the attachment is fitted into the main body.

[0028]

(13) In (12) described above, the percussion massage machine may be configured to change an operating mode of the reciprocating body when the detection sensor detects that the attachment is fitted into the main body.

[0029]

<Details of embodiments of the present disclosure>

Details of embodiments of the present disclosure are described below with reference to the drawings. It should be noted that at least some of the embodiments described below may be arbitrarily combined with each other.

[0030]

With reference to the drawings, an embodiment of a massage machine according to the present disclosure is described below with a percussion massage machine 1 as an example.

[0031]

In the description of the present embodiment, a front-rear direction, a left-right direction, and an up-down direction indicated in the drawings are used. In the drawings, illustration of some components is omitted in consideration of viewability.

[0032]

As illustrated in FIG. 1, FIG. 2, and the like, a percussion massage machine 1 of the present embodiment (also referred to simply as a massage machine main body 1 below) includes a grip portion 3 that is formed in a round rod shape in sectional view and is dimensioned to allow

a user to hold the grip portion 3 with one hand, and a head portion 4 that is provided to horizontally extend forward from a middle of the grip portion 3. The head portion 4 is also formed in a round rod shape in sectional view, and is substantially equal in diameter to the grip portion 3. The head portion 4 is located at a height corresponding to approximately one-third of a length of the grip portion 3 from an upper end of the grip portion 3. The grip portion 3 and the head portion 4 are disposed so as to be substantially orthogonal to each other.

[0033]

A reciprocating body 9 that transmits reciprocating motion for performing a tapping massage is provided on a distal end of the head portion 4. A first treatment element 5 that serves as a tapping massage member is attached to the reciprocating body 9.

[0034]

The first treatment element 5 protrudes and retracts in the front-rear direction with amplitude of approximately 1 cm to perform a percussion massage on a treatment target site of a user. The grip portion 3 includes a hollow cylindrical member 26 in which a drive motor 6 that serves as a drive source for protruding and retracting motion of the first treatment element 5, a power supply 7 for the drive motor 6, and a protrusion and retraction conversion mechanism 8 (conversion mechanism) that converts rotating motion from an output shaft of the drive motor 6 into the protruding and retracting motion of the first treatment element 5 are provided. Various configurations can be adopted as a configuration of the protrusion and retraction conversion mechanism 8. An example of the configuration of the protrusion and retraction conversion mechanism 8 is described at the end of the present embodiment.

[0035]

As described above, the percussion massage machine 1 described above is capable of performing a comfortable tapping massage on a stiff affected part, a site where fatigue has been accumulated, or the like. However, if a user is slim and has a less muscular body, vibrations by

percussion propagate through the user's bones or internal organs. Consequently, the massage is occasionally too strong depending on a user. According to the percussion massage machine 1, the first treatment element 5 that applies vibrations by percussion to a treatment target site reciprocates to protrude away from and retract toward the main body 1. However, massage machines need to meet various user requests. The percussion massage machine 1 is also required to perform "a massage that repeatedly grabs and releases a treatment target site" in some cases.

[0036]

Hence, the applicant has developed an attachment 10 for reducing the amplitude of the first treatment element 5 (or the reciprocating body 9) or changing the direction of a massage by the first treatment element 5 (or the reciprocating body 9). A first embodiment describes the attachment 10 for reducing the amplitude of the first treatment element 5, and a second embodiment describes the attachment 10 for changing the moving direction of the first treatment element 5.

[0037]

[First Embodiment]

FIGs. 1 to 4 illustrate the attachment 10 according to the first embodiment.

[0038]

The attachment 10 is formed in a cubic shape having a length of approximately 5 cm in the up-down direction, a width of approximately 5 cm in the left-right direction, and a thickness of 4 cm in the front-rear direction. The attachment 10 has corners that are chamfered. A second treatment element 11 that is substantially equal in diameter to the first treatment element 5 is disposed at a relatively upper position on a wall surface of a front wall of the attachment 10. The second treatment element 11 freely protrudes away from and retracts toward the front wall of the attachment 10 in the front-rear direction. A hole 12 into which the first treatment

element 5 and a distal end of the head portion 4 can be inserted is formed at a relatively lower position in a wall surface of a rear wall of the attachment 10. By inserting the distal end of the head portion 4 into the hole 12, the attachment 10 is fixed to the distal end of the head portion 4 as illustrated in FIG. 2.

[0039]

As illustrated in FIGs. 3 and 4, an amplitude conversion mechanism 13 that changes amplitude of the first treatment element 5 is incorporated in the attachment 10. The amplitude conversion mechanism 13 includes a lever member 14 and a biasing member 15 that generates a biasing force by which the lever member 14 is pushed back to the distal end of the head portion 4 (in other words, toward the first treatment element 5).

[0040]

The lever member 14 is a plate-shaped member and is formed in a fan shape having an upper portion with a narrow width and a lower portion with a wide width. A lever turning shaft 28 causes an upper end of the lever member 14 to freely turn (swing) in the front-rear direction (the protruding and retracting direction of the first treatment element 5) on a shaft body extending in the left-right direction. The lever turning shaft 28 has two ends attached to a case body 20 that forms an outer shell of the attachment 10.

[0041]

A width of the lever member 14 in the left-right direction from a center to a lower end of the lever member 14 in the up-down direction is slightly wider than a diameter of the first treatment element 5. The lever member 14 has a recessed thin interior that is defined by an edge and a front wall (not illustrated) of the lever member 14. The reason why the interior has a recessed shape is described later. A rod-shaped member 17 is extended across a lower end of the lever member 14 so as to pass through the lower end in the left-right direction. The rod-shaped member 17 is disposed such that a head of the first treatment element 5 is brought into

contact with a rear side of the rod-shaped member 17 (one side in the turning direction).

[0042]

A helical spring is wound around the lever turning shaft 28A that supports the upper end of the lever member 14. The helical spring is the foregoing biasing member 15. The helical spring biases the lever member 14 rearward, so that the rod-shaped member 17 is always in contact with a distal end of the first treatment element 5.

[0043]

On the other hand, a hemispherical projection 16 projecting rearward is formed on a rear surface of the second treatment element 11. The hemispherical projection 16 is brought into contact with a front wall surface of the lever member 14 (a front side of the lever member 14, in other words, another side in the turning direction) at a height corresponding to approximately half of a length of the lever member 14 in the up-down direction. That is, a distance SB from an axial center of the lever turning shaft 28A to the portion with which the first treatment element 5 is brought into contact is approximately twice a distance SF from the axial center of the lever turning shaft 28A to the portion with which the second treatment element 11 is brought into contact.

[0044]

FIG. 4 illustrates a state in which the amplitude conversion mechanism 13 of the attachment 10 converts the amplitude of the first treatment element 5.

[0045]

First, when a switch on the grip portion 3 of the massage machine main body 1 is turned on, the first treatment element 5 starts to protrude and retract. The first treatment element 5 thus moves back and forth with amplitude of approximately 1 cm.

[0046]

In a case where the attachment 10 of the first embodiment is attached to the distal end of

the head portion 4 as illustrated in (a) of FIG. 4, the first treatment element 5 protrudes so as to push the lower end of the lever member 14, that is, the rod-shaped member 17 forward as illustrated in (b) of FIG. 4, so that lever member 14 is pushed forward about the lever turning shaft 28A. At this time, the lever member 14 moves like a seesaw, so that a portion (SF) where a radius of turn from the axial center of the lever turning shaft 28A is approximately half is pushed forward by a distance corresponding to approximately half of the movement distance of the first treatment element 5. That is, the lever member 14 pushes the second treatment element 11 by approximately half (approximately half of the amplitude of the first treatment element 5) with the semispherical member interposed between the lever member 14 and the second treatment element 11, to reduce the amplitude of the second treatment element 11.

[0047]

As described above, the rear side of the lever member 14 is recessed, where only the edge is present (not illustrated). Therefore, when the first treatment element 5 protrudes to push the rod-shaped member 17 as illustrated in (b) of FIG. 4, the recess can reliably avoid the rear wall surface of the lever member 14 and the first treatment element 5 from interfering with each other. The recess can thus achieve smooth operation of the amplitude conversion mechanism 13.

[0048]

Thereafter, when the first treatment element 5 retracts as illustrated in (a) of FIG. 4, the lever member 14 turns on the lever turning shaft 28 such that the lever member 14 is pushed rearward by the biasing member 15. The contact of the rod-shaped member 17 with the first treatment element 5 is thus maintained.

[0049]

When the first treatment element 5 of the massage machine main body 1 protrudes forward and retracts rearward, the state illustrated in (a) of FIG. 4 and the state illustrated in (b)

of FIG. 4 are repeated. As a result, the amplitude of the second treatment element 11 becomes smaller than that of the first treatment element 5, so that the amplitude is reduced. By attaching or detaching the attachment 10 (accessory), the amplitude of the first treatment element 5 can be changed (reduced) with ease in this way. It is thus possible to provide the percussion massage machine 1 capable of reliably meeting various user requests. It should be noted that in order to further reduce the amplitude of the second treatment element 11, the position where the lever member 14 is in contact with the second treatment element 11 may be brought close to the lever turning shaft 28 so as to reduce the radius of turn (distance SB > distance SF).

[0050]

[Second Embodiment]

Next, a second embodiment of an attachment 10 (accessory) according to the present disclosure is described below.

[0051]

The attachment 10 of the second embodiment is also attachable to the massage machine main body 1 in which the first treatment element 5 reciprocates back and forth to apply vibrations by percussion to a treatment target site. However, massage machines need to meet various user requests. The percussion massage machine 1 is also required to perform “a massage that repeatedly grabs and releases a treatment target site” in some cases.

[0052]

In view of this, by attaching the attachment 10 of the second embodiment to the massage machine main body 1, the moving direction of the first treatment element 5 can be changed. That is, the attachment 10 of the second embodiment is configured to change percussive motion of the first treatment element 5 in the front-rear direction to grabbing motion (movement in the left-right direction and the up-down direction) of a grabbing treatment element 21 (a second treatment element 11). The attachment 10 includes a direction conversion

mechanism 25.

[0053]

FIGs. 5 and 6 illustrate the attachment 10 according to the second embodiment.

[0054]

The attachment 10 includes a case body 20 as an outer shell. The case body 20 has a trefoil shape in front view. An area of a rear surface of the case body 20 is approximately half an area of a front surface of the case body 20. The rear surface of the case body 20 has a round shape. The case body 20 has an outer shell shape that is tapered from the front surface toward the rear surface.

[0055]

Three grabbing treatment elements 21 are provided on the case body 20 so as to project from the front surface of the case body 20. The three grabbing treatment elements 21 are spaced away from each other by 120° along a peripheral edge of the attachment 10, and are disposed to project forward through three holes 22 formed in the front surface. Specifically, long arm members 23 project forward through the holes 22, and the grabbing treatment elements 21 (second treatment elements) are attached to distal ends of the arm members 23.

[0056]

It should be noted that the number of the arm members 23 may be four or five as long as a plurality of the arm members 23 are disposed. In FIGs. 5 and 6, a cover body that covers the second treatment elements 11 is not illustrated. In practice, a cover body made of cloth or silicone rubber may be provided so as to entirely cover the second treatment elements 21 and the arm members 23. Only the second treatment elements may project from the cover body.

[0057]

In the case illustrated in FIGs. 5 and 6, each grabbing treatment element 21 has an approximately spherical shape, and is made of a material, such as plastic or rubber, that applies

no load onto a treatment target site. A proximal end of each arm member 23 is connected to the direction conversion mechanism 25 incorporated in the attachment 10, and serves as a member constituting a part of the direction conversion mechanism 25. Operation of the direction conversion mechanism 25 allows the distal ends of the arm members 23, that is, the three treatment elements to be separated from and brought close to each other substantially along a plane including straight lines extending in the up-down direction and the left-right direction (this plane is referred to as a vertical plane below).

[0058]

A hole 12 into which the first treatment element 5 and the distal end of the head portion 4 in the massage machine main body 1 can be inserted is formed in the rear surface of the case body 20 of the attachment 10. By inserting the distal end of the head portion 4 into the hole 12, the attachment 10 is fixed to the distal end of the head portion 4 as illustrated in FIG. 6.

[0059]

As illustrated in FIGs. 7 and 8, the direction conversion mechanism 25 is incorporated in the attachment 10 to change protruding and retracting motion of the first treatment element 5 to motion of the grabbing treatment elements 21 to be brought close to and separated from each other.

[0060]

The direction conversion mechanism 25 includes the rod-shaped arm members 23, a cylindrical member 26 that includes a round bottom plate 27 (engagement member) with which the head of the first treatment element 5 is brought into contact, and a biasing member 15 that always biases the cylindrical member 26 toward the first treatment element 5. The direction conversion mechanism 25 also includes rod-shaped coupling lever members 30 that couple the arm members 23 and the cylindrical member 26 together.

[0061]

Specifically, as illustrated in FIGs. 7 and 8, the cylindrical member 26 is disposed such that a center of the bottom plate 27 is brought into contact with the head of the first treatment element 5 of the massage machine main body 1. An opposite side of the cylindrical member 26 to the bottom plate 27 is open, and the cylindrical member 26 is a hollow member. A diameter of the cylindrical member 26 in sectional view is substantially the same as or slightly smaller than the diameter of the first treatment element 5.

[0062]

The three coupling lever members 30, which are spaced away from each other by 120° , are attached to a peripheral edge of the bottom plate 27 of the cylindrical member 26. Each coupling lever member 30 has a rod shape that is slightly shorter in length than the corresponding arm member 23. A proximal end of each coupling lever member 30 is attached to the peripheral edge of the bottom plate 27 of the cylindrical member 26 so as to freely turn. Specifically, the proximal end of each coupling lever member 30 freely turns on a tangent that is in contact with the peripheral edge of the bottom plate 27 (i.e., the round engagement member) of the cylindrical member 26.

[0063]

In a middle of each coupling lever member 30, a lever turning shaft 28B is provided so as to pass through the coupling lever member 30. The lever turning shaft 28B has two ends fixed to the case body 20 constituting the outer shell of the attachment 10. Therefore, each coupling lever member 30 also freely turns on an axial center of the corresponding lever turning shaft 28B. Also in a middle of each arm member 23, an arm turning shaft 29 is provided so as to pass through the arm member 23. The arm turning shaft 29 has two ends fixed to the case body 20 constituting the outer shell of the attachment 10. Therefore, each arm member 23 freely turns on an axial center of the corresponding arm turning shaft 29.

[0064]

A proximal end of each arm member 23 is coupled to a distal end of the corresponding coupling lever member 30 so as to freely turn. In addition, a distal end of each arm member 23 projects forward through the corresponding hole 22 formed in the case body 20 of the attachment 10, and the corresponding grabbing treatment element 21 is provided on the distal end.

[0065]

The biasing member 15 including a helical spring is disposed within the cylindrical member 26 described above. A rear end of the biasing member 15 is in contact with the bottom plate 27 of the cylindrical member 26. A front end of the biasing member 15 projects through the open side of the cylindrical member 26 and is in contact with an inner side of the front surface of the case body 20.

[0066]

The direction conversion mechanism 25 having the foregoing configuration is capable of converting the motion of the first treatment element 5 in the front-rear direction into the grabbing motion (motion in the up-down direction and the left-right direction) of the grabbing treatment element 21.

[0067]

Specifically, when the first treatment element 5 in the state illustrated in (a) of FIG. 8 protrudes forward, the first treatment element 5 pushes the cylindrical member 26 forward via the bottom plate 27 of the cylindrical member 26 as illustrated in (b) of FIG. 8. At this time, the helical spring, that is, the biasing member 15 contracts. When the bottom plate 27 is pushed forward, the proximal ends of the coupling lever members 30 are also pushed forward, so that the distal ends of the coupling lever members 30 move rearward like a seesaw about the axial centers of the lever turning shafts 28B, and are separated from each other. The proximal ends of the arm members 23, which are coupled to the distal ends of the coupling lever members 30 so as to freely turn, also move rearward and are separated from each other. Each arm member 23

is pivotally supported at its middle by the corresponding arm turning shaft 29, and therefore operates like a seesaw. The distal ends of the arm members 23 thus move slightly rearward and are brought close to each other. As a result, the three grabbing treatment elements 21 move so as to gather at the center, that is, inward as seen from the front side.

[0068]

Thereafter, when the first treatment element 5 in the state illustrated in (b) of FIG. 8 retracts toward the head portion 4, the biasing member 15 pushes the cylindrical member 26 rearward as illustrated in (a) of FIG. 8. When the proximal ends of the coupling lever members 30 are pulled rearward, the coupling lever members 30 turn on the axial centers of the lever turning shafts 28B, so that the distal ends of the coupling lever members 30 move toward a central axial center (an axial center passing the center of the first treatment element 5 and extending in the front-rear direction). As a result, the proximal ends of the arm members 23 also turn on the axial centers of the arm turning shafts 29 like a seesaw while moving toward the central axial center, so that the grabbing treatment elements 21 on the distal ends of the arm members 23 move away from the central axial center. That is, the three grabbing treatment elements 21 are separated from each other as seen from the front surface.

[0069]

Also in the case where the number of the arm members 23 is two or more (e.g., four or five), when the first treatment element 5 protrudes forward, the distal ends of all the arm members 23 move inward and are brought close to each other. As a result, the plurality of grabbing treatment elements 21 are gathered at the center (the center of the case body 20) as seen from the front side.

[0070]

It should be noted that the direction conversion mechanism 25 may have such a structure that the coupling lever members 30 are eliminated, the proximal ends of the arm

members 23 are engaged with the bottom plate 27, and the second treatment elements 21 are provided on the distal ends of the arm members 23. Specifically, long grooves are formed in the disk-shaped bottom plate 27 so as to extend to the center of the bottom plate 27. Each long groove has a structure for preventing the proximal end of the corresponding arm member 23 from coming out of the long groove. When the first treatment element 5 pushes the bottom plate 27 forward, the proximal ends of the arm members 23 slide along the long grooves and move toward the center of the bottom plate 27 (the central axial center described above). As a result, the distal ends of the arm members 23 can be separated outward from each other.

[0071]

Alternatively, the first treatment element 5 may have at its distal end a magnetizing member or a hook member for allowing engagement with the bottom plate 27. In this engagement state, when the bottom plate 27 is pulled rearward, the proximal ends of the arm members 23 move away from the center of the bottom plate 27 (the central axial center described above). As a result, the distal ends of the arm members 23 can be brought close to each other.

[0072]

As described above, the direction conversion mechanism 25 incorporated in the attachment 10 of the second embodiment is capable of converting “the movement, in the front-rear direction,” of the first treatment element 5 corresponding to a first treatment element into “the movement, in the left-right direction and the up-down direction,” of each grabbing treatment element 21 corresponding to a second treatment element, that is, “the direction intersecting with the protruding and retracting direction of the first treatment element 5”. If the movement of the treatment element can be converted with ease, the percussion massage machine 1 can reliably meet various user requests, for example, a request to perform “a massage that repeatedly grabs and releases a treatment target site”.

[0073]

Meanwhile, when the first treatment element 5 protrudes and retracts in short cycles so as to be specialized for a percussion massage, the movement of each grabbing treatment element 21 converted by the attachment 10 of the second embodiment becomes too fast, so that it is occasionally difficult to attain a desired effect of treatment (a grabbing massage by the grabbing treatment elements 21). Preferably, the grabbing motion of the three grabbing treatment elements 21 is relatively slow.

[0074]

In view of this, the following mechanism may be provided. Specifically, a small permanent magnet is embedded in the vicinity of the hole 12 in the attachment 10 of the second embodiment. In addition, a magnetic sensor such as a Hall sensor is disposed on the head portion 4 at a position corresponding to the permanent magnet. When the magnetic sensor detects magnetism, it becomes clear that the attachment 10 attached to the head portion 4 is the attachment 10 of the second embodiment and includes a mechanism for performing treatment using the grabbing treatment elements 21. It is therefore possible to achieve comfortable movement of the grabbing treatment elements 21, that is, a comfortable grabbing massage by, for example, reducing the rotation speed of the drive motor 6 of the massage machine main body 1 so as to change the number of amplitudes or vibrations of the first treatment element.

[0075]

Specifically, the massage machine main body 1 has various operating modes and operating patterns. For example, in order to effectively massage a stiff treatment target site, the massage machine main body 1 has an operating mode 1 “of vibrating the first treatment element 5 (reciprocating body 9) at low vibration and low amplitude for an initial certain period of time, then vibrating the first treatment element 5 (reciprocating body 9) at high vibration and high amplitude, and finally vibrating the first treatment element 5 (reciprocating body 9) at low vibration and low amplitude for the purpose of cooling down”. The user can select the

operating mode 1 by selecting one of automatic functions of the massage machine main body 1. At this time, when the magnetic sensor detects that the attachment 10 of the second embodiment has been attached, the massage machine main body 1 can change the operating mode 1 to another operating mode such as an operating mode 2 “of causing the first treatment element 5 (reciprocating body 9) to protrude and retract at fixed vibration and fixed amplitude from the beginning to the end”.

[0076]

It should be noted that a sensor to be attached is not limited to a magnetic sensor, and may be a mechanical sensor.

[0077]

[Massage machine main body]

Each of the attachments 10 according to the foregoing two embodiments is attachable to the percussion massage machine 1. However, the structure and shape of the percussion massage machine 1 to which each of the foregoing attachments 10 is attached are not particularly limited.

[0078]

FIG. 9 illustrates an example of the percussion massage machine 1, that is, the massage machine main body 1.

[0079]

As illustrated in FIG. 9, the massage machine main body 1 suitable for each of the attachments 10 of the present disclosure includes the grip portion 3 that is dimensioned to allow the user to hold the grip portion 3 with one hand, and the head portion 4 that is provided to horizontally extend forward from the middle of the grip portion 3. The grip portion 3 and the head portion 4 are disposed so as to be substantially orthogonal to each other. The first treatment element 5 (first treatment element) is provided on the distal end of the head portion 4.

[0080]

The grip portion 3 includes the hollow cylindrical member 26 in which the drive motor 6 that generates a driving force for the protruding and retracting motion of the first treatment element 5 is disposed. The drive motor 6 is located on an upper side of the grip portion 3. The axial center of the drive motor 6 is oriented downward.

[0081]

The first treatment element 5 is connected to a distal end of a crank arm 40 having a long rod shape, with a crank pin so as to freely turn. A proximal end of the crank arm 40 is eccentrically attached to a rotating shaft of the foregoing drive motor 6 with an eccentric member. On the other hand, the first treatment element 5 is attached to the distal end of the crank arm 40 so as to freely turn. Therefore, when the drive motor 6 rotates, the rotating shaft rotates, so that the proximal end of the crank arm 40 eccentrically rotates. This involves “piston and crank motion” of the crank arm 40. As a result, the first treatment element 5 corresponding to a piston reciprocates back and forth in short cycles. In order to restrict unnecessary vibrations owing to this piston and crank motion, the eccentric member is provided with a counterweight at a position opposite the eccentric position of the proximal end of the crank arm 40.

[0082]

The power supply 7 for driving the drive motor 6 is provided in the grip portion 3. The power supply 7 is located on a lower side of the grip portion 3. The power supply 7 is preferably a rechargeable battery.

[0083]

It should be noted that the foregoing configuration of the massage machine main body 1 is merely exemplary and is not limited as long as the first treatment element is the first treatment element 5 that moves back and forth and the attachment 10 is attached to the first treatment

element 5. In addition, the first treatment element is not limited to one that performs a percussion massage.

[0084]

It should be understood that embodiments disclosed herein are illustrative and not restrictive in all respects. In particular, as matters that are not explicitly described in the embodiments disclosed herein, such as activating conditions or operating conditions, and dimensions, weights, and the like of constituents, matters are adopted that can be easily conceived by a person skilled in the art without departing from the scope of ordinary implementations by a person skilled in the art.

REFERENCE SIGNS LIST

[0085]

- 1 massage machine main body (percussion massage machine)
- 3 grip portion
- 4 head portion
- 5 first treatment element
- 6 drive motor
- 7 power supply
- 8 protrusion and retraction conversion mechanism
- 9 reciprocating body
- 10 attachment
- 11 second treatment element (treating body)
- 12 hole
- 13 amplitude conversion mechanism
- 14 lever member

- 15 biasing member
- 16 projection
- 17 rod-shaped member
- 20 case body
- 21 grabbing treatment element (second treatment element)
- 22 hole
- 23 arm member
- 25 direction conversion mechanism
- 26 cylindrical member
- 27 bottom plate (engagement member)
- 28A lever turning shaft
- 28B lever turning shaft
- 29 arm turning shaft
- 30 coupling lever member
- 40 crank arm
- 41 eccentric member
- 42 counterweight

CLAIMS

[Claim 1] An attachment attachable to a massage machine including a reciprocating body configured to transmit reciprocating motion for performing a tapping massage on a treatment target site of a user,

the attachment attachable to the massage machine, comprising:

a treating body configured to move differently from the reciprocating body; and

a conversion mechanism configured to convert movement of the reciprocating body into movement of the treating body.

[Claim 2] The attachment attachable to the massage machine according to claim 1, wherein

the reciprocating body reciprocates so as to freely protrude outward and retract inward,

the treating body freely protrudes outward and retracts inward so as to perform the tapping massage on the treatment target site of the user, and

the conversion mechanism converts protrusion and retraction of the reciprocating body into protrusion and retraction of the treating body and changes amplitude of the reciprocating body to amplitude of the treating body.

[Claim 3] The attachment attachable to the massage machine according to claim 1, wherein

the reciprocating body reciprocates so as to freely protrude outward and retract inward,

and

the conversion mechanism converts a moving direction of the treating body into a direction intersecting with a protruding and retracting direction of the reciprocating body.

[Claim 4] The attachment attachable to the massage machine according to claim 2,
wherein

the conversion mechanism includes a lever portion having one end or a middle that is
pivotally supported so as to freely turn in a protruding and retracting direction of the
reciprocating body,

the reciprocating body engages with one end of the lever member in a turning direction
of the lever member,

the treating body engages with another end of the lever member in the turning direction,
and

with regard to a distance SB from a pivot axial center of the lever portion to an
engagement position of the reciprocating body and an engagement position SF from the pivot
axial center of the lever member to the treating body, the distance SB and the distance SF are
different from each other.

[Claim 5] The attachment attachable to the massage machine according to claim 4,
wherein the distance SF is shorter than the distance SB so that protrusion and retraction
amplitude of the reciprocating body is reduced and converted into protrusion and retraction
amplitude of the treating body.

[Claim 6] The attachment attachable to the massage machine according to claim 3,
wherein

the conversion mechanism includes:

a plurality of arm members; and

an engagement member with which the reciprocating body engages,

a plurality of the treating bodies are disposed on distal ends of the arm members, and

the reciprocating body pushes the engagement member forward or pulls the engagement member rearward to separate or bring proximal ends of the arm members from or close to each other and to bring or separate the distal ends of the arm members close to or from each other.

[Claim 7] The attachment attachable to the massage machine according to claim 3, wherein

the conversion mechanism includes:

a plurality of arm members;

an engagement member with which the reciprocating body engages; and

a plurality of coupling members configured to couple the corresponding arm members and the engagement member together,

a plurality of the treating bodies are disposed on distal ends of the arm members,

a proximal end of each arm member engages with the engagement member via the corresponding coupling member such that the distal end and the proximal end of the arm member move in a form of a seesaw with a middle of the arm member pivotally supported so as to freely turn, and

the reciprocating body pushes the engagement member forward to separate the proximal ends of the arm members from each other and bring the distal ends of the arm members close to each other via the coupling members.

[Claim 8] The attachment attachable to the massage machine according to claim 6, wherein the arm members are provided at equal intervals around an axial center of the reciprocating body in a moving direction of the reciprocating body.

[Claim 9] The attachment attachable to the massage machine according to claim 7,

wherein the arm members are provided at equal intervals around an axial center of the reciprocating body in a moving direction of the reciprocating body.

[Claim 10] The attachment attachable to the massage machine according to any one of claims 1 to 9, wherein

 a first treatment element configured to perform the tapping massage on the treatment target site of the user is attachable to the reciprocating body, and

 the treating body serves as a second treatment element configured to move for performing a massage on the treatment target site of the user.

[Claim 11] A percussion massage machine comprising:

 a main body;

 a reciprocating body configured to protrude away from and to retract toward the main body to perform a tapping massage on a treatment target site of a user; and

 the attachment according to any one of claims 1 to 10, the attachment being attachable to the main body so as to cover the reciprocating body.

[Claim 12] The percussion massage machine according to claim 11, wherein a detection sensor is disposed on each of or one of the main body and the attachment to detect that the attachment is fitted into the main body.

[Claim 13] The percussion massage machine according to claim 12, wherein an operating mode of the reciprocating body is changed when the detection sensor detects that the attachment is fitted into the main body.