ARTICLE OF MANUFACTURE FOR ASSISTING A USER TO ENGAGE A HANDLE

Disclosed is an article of manufacture for assisting a user in engaging a handle or a clip connection or a string. In one embodiment, the article of manufacture comprises a body, a securing member attached to the body, and an elongated hollow member attached to the body, wherein the article of manufacture is designed to allow the user to position his or her limb in the article of manufacture so that the securing member secures the user's limb to the article of manufacture and the elongated hollow member can be slipped over the handle to secure it to the body.
ARTICLE OF MANUFACTURE FOR ASSISTING A USER TO ENGAGE A HANDLE

CROSS-REFERENCE TO RELATED APPLICATION


FIELD OF THE INVENTION

[0002] This invention relates to exercise aids useful in, for example, exercise of the upper extremities or shoulder girdle muscles of a patient. The invention aids the patient in gripping the exercise equipment. The invention can also aid the patient in gripping other devices such as a safety device.

BACKGROUND OF THE INVENTION

[0003] In the United States, stroke affects more than 700,000 individuals annually. A stroke, which is sometimes referred to as a “cerebrovascular accident” or “brain attack,” is a sudden interruption in blood flow in the brain. The cause of a stroke can sometimes be a blockage or a rupture in a blood vessel in, or leading to, the brain. As a result of the stroke, there is an interruption of blood flow to the brain and as a result, there is a disruption of oxygen and other essential nutrients carried by the blood.

[0004] After only four to five minutes without sufficient oxygen, many cells of the brain suffer permanent damage or die. As a result, for stroke survivors, there may be impairment or destruction of function(s) of the brain that controls motor skills, thus jeopardizing the stroke victim’s ability to walk, talk, or even perform basic physical tasks such as gripping any device.

[0005] Survivors of a stroke, or any other medical condition, disease or accident in which motor functions are affected, are often required to go through a number of therapeutic and rehabilitative processes. An important element of the overall rehabilitative process is physical therapy ("PT") and occupational therapy ("OT"). PT often involves re-learning functions such as transferring objects from one area to another, walking, and other motor functions. OT often involves exercises and training to help the patient perform every day activities such as eating, drinking, dressing, reading and writing. As is apparent, such rehabilitative processes will involve a degree of gripping so as to manipulate the exercise aid.

[0006] Therefore, there exists the need to provide individuals who have difficulties using the muscles in their extremities, or any user, the ability to engage in a full range of exercise options for a most effective physical therapy or rehabilitation.

SUMMARY OF THE INVENTION

[0007] In one aspect, this invention relates to an article of manufacture for assisting a user in engaging a handle or a clip connection or a string. In one embodiment, the article of manufacture comprises a body, a securing member attached to the body, and an elongated hollow member attached to the body, wherein the article of manufacture is designed to allow the user to position his or her limb in the article of manufacture so that the securing member secures the user’s limb to the article of manufacture and the elongated hollow means can be slipped over the handle to secure it to the body.

[0008] In one embodiment, this invention is directed to an article of manufacture for assisting a user to engage a handle of a device wherein the article comprises a body having a proximal end and a distal end, wherein the body comprises x-, y- and z-directions each of which is perpendicular to each other; (b) at least one securing member attached to said body for securing the body to at least a portion of a limb of the user; (c) a tubular member positioned at or near the distal end of said body wherein the tubular member comprises a first and a second end, wherein at least one of said ends is open and fits into and engages said handle of said exercise equipment.

[0009] In a particular embodiment, the article of manufacture further comprises a gripping member which is positioned on the z-axis at a point intermediate between said distal end and said proximal end of said body. This gripping member permits the patient to orient his/her hand in a gripping fashion to maximize the therapy as necessary for recovery of muscular tone.

[0010] In another particular embodiment, the tubular member is rotatable around the y and z axis of the body to permit ready alignment of the tubular member with said handle of said exercise equipment.

[0011] In another embodiment, the present invention is directed to an article of manufacture for assiting a user to engage a handle, wherein the article comprises a proximal end and a distal end, and (a) a body, wherein the body comprises x-, y- and z-directions each of which is perpendicular to each other; (b) at least one securing member for securing the body to at least a portion of a limb of the user; and (c) an attaching member for attaching to a detachable tubular member at the distal end of the article which tubular member is for engaging a handle or a clip connection. In some embodiments, the tubular member comprises a first and a second end, wherein at least one of said ends is open and fits into and engages said handle of said exercise equipment. In some embodiments, the tubular member further comprises a complementary attaching member for attaching to the article at the distal end of the article.

[0012] In another embodiment, the invention relates an article of manufacture for assisting a user to engage a handle and/or clip connection, wherein the article comprises a proximal end and a distal end, and: (a) a body, wherein the body comprises x-, y- and z-directions each of which is perpendicular to each other; b) at least one securing member for securing the body to at least a portion of a limb of the user; and c) an attaching member for attaching to a detachable tubular member; wherein tubular member is positioned at or near the distal end of said body, wherein the tubular member comprises a first end and a second end, wherein at least one of said ends is open and engages said handle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1A is a perspective view of an exemplary embodiment of the article of manufacture 10 of the present invention.

[0014] FIG. 1B is a perspective view of an exemplary embodiment of the article of manufacture 10 of the present invention.

[0015] FIG. 1C is a perspective view of an exemplary embodiment of the article of manufacture 10 of the present invention.
FIG. 2A is a perspective view of an exemplary embodiment of the securing member 30 of the article of manufacture 10 of the present invention.

FIG. 2B is a perspective view of an exemplary embodiment of the securing member 30 of the article of manufacture 10 of the present invention.

FIG. 2C is a perspective view of an exemplary embodiment of the securing member 30 of the article of manufacture 10 of the present invention.

FIG. 2D is a perspective view of an exemplary embodiment of the securing member 30 of the article of manufacture 10 of the present invention.

FIG. 2E is a perspective view of an exemplary embodiment of the securing member 30 of the article of manufacture 10 of the present invention.

FIG. 2F is a perspective view of an exemplary embodiment of the securing member 30 of the article of manufacture 10 of the present invention.

FIG. 3A is a cross-sectional view of the exemplary embodiment of the article of manufacture 10 of FIG. 1A taken along line 3A-3A.

FIG. 3B is a cross-sectional view of the exemplary embodiment of the article of manufacture 10 of FIG. 1A taken along line 3B-3B.

FIG. 4 is a perspective view of an exemplary embodiment of the article of manufacture 10 of the present invention as it may be used with an exemplary piece of exercise equipment 50.

FIG. 5 is a perspective view of an exemplary embodiment of the article of manufacture 10 of the present invention as it may be used to engage the handle 51 of an exemplary piece of exercise equipment 50.

FIG. 6 is a top view of an exemplary embodiment of the article of manufacture 10 of the present invention wherein the tubular member 40 is rotatable and which comprises a gripping member 76.

FIG. 7 is a perspective view of an exemplary embodiment of the article of manufacture 10 of the present invention wherein the tubular member 40 is rotatable and which comprises a gripping member 76.

FIG. 8 is a cross-sectional view of the distal portion of an exemplary embodiment of a rotatable connection of the present invention wherein the tubular member 40 is rotatable.

FIG. 9 is a perspective view of the distal portion of an exemplary embodiment of article of manufacture 10 of the present invention comprising an attaching member 44 for attaching to a detachable tubular member 40, and a detachable tubular member 40 having a complementary attaching member 45 for connecting to the article of manufacture 10.

INTEGRATION BY REFERENCE

All publications and patent applications (if any) mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference.

DETAILED DESCRIPTION OF THE INVENTION

As used herein, certain terms have the following defined meanings.

As is used herein, “patient” or “user” refers to a human subject that may have suffered from a stroke, or any other medical condition, disease or accident in which their motor functions are affected. In one embodiment, the patient, or user, is either incapable or less than capable of adequate gripping onto a handle or similar means or unable to perform pronation and/or supination movements due to loss of muscular control over one, or both, of their hands or arms.

As is used herein, “securing member” or “securing means” refers to any method or device that may be used to secure the article of manufacture of the present invention to the patient or user. Non-limiting exemplary embodiments of securing member or means are described infra.

As is used herein, “exercise equipment” refers to any device, object (particularly weighted object) or piece of machinery that may be used by a human subject to strengthen, tone, or train one or more muscle groups, as well as mobility equipment—a walker, a wheelchair, etc. In one embodiment, the exercise equipment that may be used with the article of manufacture of the present invention may have, or be adapted to have, one or more handles or similar means, for the patient or user to engage while using the piece of exercise equipment.

In one embodiment, the article of manufacture may be used to assist a person who has limited use of an extremity in exercising their muscles. The article of manufacture may be especially useful to patients who have difficulty or inability in gripping the handle portion of a piece of exercise equipment and/or performing pronation and/or supination movements. The article of manufacture of the invention can also be used to assist a user to use other devices such as, a safety device, for example a handrail in a bath tub or shower, a handrail on a bus or a train, etc. In addition to aiding stroke victims, the article of manufacture is useful for patients having a variety of infirmities, including, but not limited to, arthritis in the hands, congenital birth defects, brain or neuromuscular problems, cancer, cerebral palsy (CP), etc., subjects born with malformed hands, and subjects with fractured hands or forearms.

Without the use of the exercise equipment, patients suffering from the infirmities mentioned supra are often limited in their ability to perform isometric based exercises. Surprisingly, it has been discovered that many patients who have difficulties using the muscles in their extremities can benefit from performing exercises that go beyond the range of isometric-based exercises. Even more surprisingly, it has been found that by providing the users with an article of manufacture of this invention that assists the user to engage a handle, the user is then able to perform a wider variety of exercises and reap a greater number of benefits from physical therapy.

Article of Manufacture for Use

In one aspect, this invention relates to an article of manufacture for assisting a user in engaging a handle or a clip connection or a string. In one embodiment, the article of manufacture comprises a body, a securing member attached to the body, and a tubular member attached to the body, wherein the article of manufacture is designed to allow the user to position his or her limb in the article of manufacture so that the securing member secures the user’s limb to the article of manufacture and the elongated hollow means can be slipped over the handle to secure it to the body.

The elongated hollow member comprises a first and a second end, wherein at least one of said ends is open thus causing at least a portion of the core of the elongated hollow member to be hollow, and wherein the cross-section of the elongated hollow member may be in any shape suitable for
engaging in a handle. For example, the cross-section of the elongated hollow member may also be in a triangle, oval, rhombus, tetragon, pentagon, etc., or in an irregular shape. It is to be understood that the dimensions of the cross-section of the elongated hollow member may be smaller or greater than, or substantially the same as the length of the elongated hollow member defined from the first end to the second end. For example, the diameter of the cross-section of an elongated hollow member having a circular cross-section or the diagonal of the cross-section of an elongated having a rectangle or square cross-section may be smaller or larger than, or substantially equal to the length of the elongated hollow member.

In some embodiments, the elongated hollow member is a tubular member. In the following detailed description of certain embodiments of the present invention, a tubular member is often used as an example of the elongated hollow member. It is to be understood that any shaped elongated hollow member suitable for engaging a handle or a clip connection is encompassed by the invention and can replace the tubular member.

In one embodiment, this invention relates to an article of manufacture (10) for assisting a user to engage a handle (51) and/or clip connection, wherein the article (10) comprises a proximal end (22) and a distal end (21), and:

a) a body, wherein the body (20) comprises x-, y- and z-directions each of which is perpendicular to each other;

b) at least one securing member (30) for securing the body (20) to at least a portion of a limb of the user; and

c) a tubular member (40) positioned at or near the distal end (21) of said body (20); wherein the tubular member comprises a first end (41) and a second end (42), wherein at least one of said ends is open and engages said handle (51).

In another embodiment, the invention relates to an article of manufacture (10) for assisting a user to engage a handle and/or clip connection, wherein the article (10) comprises a proximal end (22) and a distal end (21), and:

a) a body (20), wherein the body comprises x-, y- and z-directions each of which is perpendicular to each other;

b) at least one securing member (30) for securing the body to at least a portion of a limb of the user; and

c) an attaching member (44) for attaching to a detachable tubular member (40); wherein the attaching member (44), wherein tubular member (40) positioned at or near the distal end (21) of said body (20), wherein the tubular member (40) comprises a first end (41) and a second end (42), wherein at least one of said ends is open and engages said handle (51).

In some embodiments, at least one securing member is adjustable.

In some embodiments, securing member is a sleeve through which the arm of the user fits.

In some embodiments, the second end of the tubular member is open. In some embodiments, the tubular member is hollow. In some embodiments, the tubular member is not rotatable. In some embodiments, the tubular member is rotatable.

In some embodiments, the body is rigid.

In some embodiments, the limb is an arm. In some embodiments, the limb is a forearm.

In some embodiments, the article further comprises a clearance between the body and the tubular member such that the user may grasp the tubular member.

In some embodiments, the article further comprises a ring.

In some embodiments, the body is cushioned. In some embodiments, the body further comprises a layer of padding.

In some embodiments, the article further comprises a gripping member attached to the body for being grasped by a hand of the user.

FIG. 1A shows an exemplary embodiment of the article of manufacture 10 of the present invention. The article of manufacture 10 comprises a body 20 wherein the body 20 has a proximal end 22 that, when being used in its prescribed manner, is closer to the torso of the patient or user, and a distal end 21 that is relatively further away from the torso of the patient or user. The body 20 may be oriented according to an x-direction, which may be substantially parallel with the length of the body 20, and a y-direction and a z-direction, which x-, y- and z-directions are perpendicular to each other. The article of manufacture 10 also comprises at least one securing member (or securing means) 30 attached to the body 20 for securing the body 20 of the article of manufacture 10 to at least a portion of a limb of the user. In one embodiment the limb of the user is the arm of the user. In another embodiment the limb of the user is the leg of the user.

The body 20 of the article of manufacture 10 may be made of any material that is suitable for providing adequate support to the patient or user using the article of manufacture 10. Non-limiting examples of materials that may be used to construct the article of manufacture include: cotton, wool, leather, synthetic fiber, plastic, fiberglass, metal, wood, PVC, polycarbonate, rubber, and the like, as well as combinations thereof. In one embodiment, the body 20 is rigid. In some embodiments, the body 20 of the article of manufacture 10 may be contoured to the shape of the limb that the user will be using with the article of manufacture 10. Without wishing to be limited by theory, it is thought that by contouring the body 20 of the article of manufacture this will provide ergonomic support to the patient or user. In another embodiment, the body 20 may be cushioned, e.g., the body may comprise a layer of padding, to provide additional comfort to the patient or user. An embodiment comprising a layer of padding 37 is exemplified in FIG. 1B.

The securing member 30 may be, but is not limited to, an armband, strap, or sleeve that may be adjustable to fit around at least a portion of the limb of the patient or user. In one embodiment, the securing member 30 comprises at least one strap that secures the limb of the patient to the article of manufacture 10 with a ladder lock-type strap, button, draw-string, buckle, brace, clamp, clasp, hook, rivet, or zipper, or the like. In one embodiment, the securing member 30 may be fastened and/or adjusted using at least one hook-and-loop fastener strap, such as a VELCRO® or DURA GRIP™ fastener. In some embodiments, the securing member 30 may be elastic. In some embodiments, there may be more than one securing members 30 used in combination. When multiple securing members 30 are employed, the different securing members 30 used may or may not be of the same type.

Non-limiting examples of securing member are shown in FIGS. 2A-2F. One of skill in the art may appreciate that any means suitable for securing the article of manufacture 10 to the limb of the user may be employed.

In FIG. 2A the securing member 30 of the article of manufacture 10 comprises a sleeve that may fit around the limb of the user. In one embodiment, the armband or sleeve comprises a stretchable material such as spandex (or elas-tane).
[0062] In FIG. 2B the securing member 30 comprises a first strap 31 and a second strap 32. In the exemplary embodiment shown in FIG. 2B the second strap 32 comprises a free-end wherein the second strap 32 may be looped through, and then secured, in a ladder-lock-type mechanism 31b of the first strap 31. In the embodiment shown in FIG. 2B, the securing member 30 may be adjusted to different degrees of tightness when used to secure the article of manufacture 10 to the user.

[0063] In FIG. 2C the securing member 30 comprises a first strap 31 and a second strap 32. In the exemplary embodiment shown in FIG. 2C the securing member 30 further comprises hook-and-loop fastener, such as VELCRO® fastener, areas 31c on the complementary surfaces of the first strap 31 and second strap 32, respectively. In one embodiment the hook-and-loop fastener areas 31c are provided such that the straps 31 and 32 may be provided to different degrees of tightness when used to secure the article of manufacture 10 to the user.

[0064] In FIG. 2D the securing member 30 comprises a first strap 31 and a second strap 32. In the exemplary embodiment shown in FIG. 2D the securing member 30 further comprises snaps or buttons 31d on the complementary surfaces of the first strap 31 and second strap 32, respectively. In one embodiment a number of snaps or buttons 31d are provided such that the straps 31 and 32 may be provided to different degrees of tightness when used to secure the article of manufacture 10 to the user.

[0065] In FIG. 2E the securing member 30 comprises a first strap 31 and a second strap 32. In the exemplary embodiment shown in FIG. 2E the securing member 30 further comprises loops 31e on the first strap 31 and second strap 32, respectively. In one embodiment a number of loops 31e are provided such that the straps 31 and 32 may be provided to different degrees of tightness when used to secure the article of manufacture 10 to the user.

[0066] In FIG. 2F the securing member 30 comprises a first strap 31 and a second strap 32. In the exemplary embodiment shown in FIG. 2F the securing member 30 further comprises a clamping mechanism 32 that may be used to secure the first strap 31 and second strap 32 together. In one embodiment the clamping mechanism 32 is provided such that the straps 31 and 32 may be provided to different degrees of tightness when used to secure the article of manufacture 10 to the user.

[0067] It is to be understood that the number of straps of the securing member 30 may vary. In some embodiments, the securing member comprises at least one strap which is of sufficient length to wrap around the limb of the patient and to secure the limb by connecting to the body with a ladder lock-type strap, button, drawstring, buckle, brace, clamp, clasp, hook, rivet, hook-and-loop fastener, or zipper, or the like or combinations thereof. In some embodiments, the securing member comprises at least two straps on the opposite sides of the body which can be connected with each other with a ladder lock-type strap, button, drawstring, buckle, brace, clamp, clasp, hook, rivet, hook-and-loop fasteners, or zipper, or the like or combinations thereof to secure the limb of a patient. FIGS. 2A-2F show certain embodiments of the article of manufacture having two straps on the opposite sides (25 or 26 as shown in, for example FIGS. 2B and 2C) of the body 20. The securing member 30 may comprise one strap on one side (e.g. 25) of the body 20 and two or more straps, preferably of smaller width, on the other side (e.g. 26) of the body 20, wherein the strap on side 25 is connected to the two or more straps on side 26 to secure the limb of the patient. It is contemplated that the securing member can also be other configurations so long as it can secure the limb of the patient to the article of manufacture 10 when the patient is engaging in an excise or physical movement in which the article of manufacture 10 is useful.

[0068] A number of ways can be employed to form the body 20 with the securing member 30. For example, the body and the securing member may be one piece. For example, a piece of a material may be cut into a cross shape or a “T” shape to form the body 20 with the securing member comprising two straps. Or a piece of a material may be cut into a “T” shape to form the body 20 with a securing member 30 comprising one strap. Alternatively the securing member 30 may be attached to the body 20 by applying stitches, adhesives, pins, button, drawstring, buckle, brace, clamp, clasp, hook, hook-and-loop fastener, rivet, or zipper, or the like or combinations thereof. Other attachment methods known to those skilled in the art are also encompassed by this invention.

[0069] The article of manufacture 10 further comprises at least one elongated hollow member, such as tubular member 40 (FIG. 1A). In one embodiment, the tubular member 40 may be used to engage the handle 51 of an exercise equipment (FIG. 4). In one embodiment, the tubular member 40 may be attached to the body 20 at the distal end 21 of the body 20. In another embodiment the tubular member 40 is attached to the body 20 at the distal end 21 of the body 20 in such a way that the tubular member 40 may engage a handle, such as a handle on a piece of exercise equipment. In some embodiments, the tubular member 40 is detachable. In another particular embodiment, the tubular member 40 is rotatable around the y and z axis of the body 20 to permit ready alignment of the tubular member 40 with said handle 51 of said exercise equipment 50. Examples of rotatable tubular member 40 are shown in FIGS. 6-8. In some embodiments, for example as shown in FIGS. 6 and 7, the article of manufacture 10 further comprises a gripping member 76 which is positioned on the z-axis at a point intermediate between said distal end 21 and said proximal end 22 of said body 20. This gripping member 76 permits the patient to orient his/her hand in a gripping fashion to maximize the therapy as necessary for recovery of muscular tone. The gripping member 76 can be made of a variety of materials, such as wool, leather, synthetic fibers, plastic, resin, fiberglass, metal, wood, polyvinylchloride, polycarbonate, and rubber, etc. It can be made of the same material as or a different material from that of the body. The holding bar is preferably rigid.

[0070] In an alternative embodiment, the article of manufacture 10 comprises an attaching member 44 wherein the attaching member 44 attaches a detachable tubular member 40. In one embodiment the attaching member is attached at or close to the distal end 21 of the body 20. The attaching member 44 may comprise any of the following: a ladder lock-type strap, button, drawstring, buckle, brace, clamp, clasp, hook, rivet, string, hook-and-loop fastener, or zipper, or the like or combinations thereof. For example, in FIG. 1C, the attaching member comprises two straps that can be inserted through the hollow core 43 (FIG. 3A) of the tubular member 40 and connected to each other so that the tubular member 40 can be attached to the body 20. In some embodiments, the detachable tubular member 40 has at least one complementary attaching member so that it can be attached to the body 20. For example, in FIG. 9, the attaching member 44 comprises a female connector which can attach to a complement-
In some embodiments, the attaching member 44 comprising a male connector on a detachable tubular member 40 can rotate and permit ready alignment of the tubular member 40 with the handle 51 of the exercise equipment 50 without need of the user to rotate his or her limb. An exemplary attaching member 40 having a rotatable connection is shown in FIG. 7. In FIG. 7, the rotatable connection comprises a swivel 61 located on a rigid board 72 extending perpendicularly from the distal end 21 of the body 20. In some embodiments, the swivel 71 comprises a cylindrical rod 73 comprising a proximal end 74 connecting the rigid board 72 and a distal end 75 connecting the tubular member 40 (as shown in FIG. 6 & FIG. 8). The cylindrical rod 73 can turn relative to the rigid board 72 and/or the tubular member 40. Preferably, the rod 73 is prevented from slipping out of the rigid board 72 and/or the tubular member 40 by a nut, washer on the proximal end 74 and/or the distal end 75 of the rod or thickening of the proximal end 74 and/or the distal end 75 the rod 73.

In some embodiments, a single article of manufacture 10 may be used with multiple tubular members 40. For example, a first tubular member 40 may be detached from the article of manufacture 10 and replaced with a second tubular member 40 which may be of different size, shape, elasticity, etc. than the first tubular member 40 and may be used to perform a different function or be used with a different piece of exercise equipment or safety equipment or other devices than the first tubular member 40.

In an alternative embodiment, the tubular member 40 may be adjustable in size or shape to accommodate different sized or types of handles of different pieces of exercise equipment or safety equipment or other devices.

Still another embodiment, the tubular member 40 may be fitted with inserts such that the outer diameter of the inserts fits securely within the tubular member 40 and the inner diameters of the inserts accommodate different sized or types of handles of different pieces of exercise equipment or safety equipment or other devices.

The tubular member 40 comprises a first end 41, and a second end 42. FIG. 3A shows a cross-sectional view of an exemplary embodiment of the article of manufacture 10 of FIG. 1 taken along line 3A-3A. In one embodiment, the first end 41 is open such that the tubular member 40 may engage with a handle, grip, or other part of a piece of exercise equipment. In the embodiment shown in FIG. 3A, the second end 42 of the tubular member 40 is also open. Also in the embodiment shown in FIG. 3A, the core 43 of the tubular member 40 is hollow. FIG. 3B shows an alternative exemplary embodiment of the tubular member 40 of FIG. 1A taken along line 3B-3B. In the embodiment shown in FIG. 3B the core 43 of the tubular member 40 is provided such that the second end 42 of the tubular member 40 is closed. In the embodiment shown in FIG. 3B the core 43 of the tubular member 40 is not hollow the entire length of the tubular member 40, but the core 43 is provided such that there is an opening in the first end 41 such that the tubular member 40 may engage the handle, grip, or other part of a piece of exercise equipment or safety equipment or other devices.

The tubular member 40 may be attached to the body 20 of the article of manufacture 10 using any means known in the art. Non-limiting examples of suitable means for attachment include snaps, hook and loop fastener, such as VELCRO®, interlocking joints, buttons, zippers, straps, pins, bolts, shaft, screw, and the like. In one embodiment the tubular member 40 is attached to the body 20 of the article of manufacture 10 such that there is a small clearance space 35 (FIGS. 3A-3B) between the tubular member 40 and the body 20. It is thought that by providing a small amount of clearance, the user may be able to insert their fingers or hand into the clearance space to allow for improved stability and/or control of the article of manufacture 10 during use by allowing the user the opportunity to grasp the tubular member 40.

In some embodiments, the article of manufacture 10 may be used with multiple tubular members 40. For example, a first tubular member 40 may be detached from the article of manufacture 10 and replaced with a second tubular member 40 which may be of different size, shape, elasticity, etc. than the first tubular member 40. Without wishing to be limited by theory, it is thought that by providing an article of manufacture capable of using multiple tubular members 40, the patient or user may have the advantage of being able to use multiple pieces of exercise equipment without having to constantly readjust the securing member of the article of manufacture 10.

In some embodiments, the article of manufacture 10 may further comprise at least one ring 23 to provide a clip connection, which is a connection mechanism to a cable, a clip, or an elastic string, such as a rubber band, either as part of an exercise equipment or as a stand alone exercise equipment. For example, a rubber band may be fixed to a structure, such as a wall of a room, a tree, or a pole, or the like, and be connected to the ring 23 of the article of manufacture 10, so that a person may engage in an exercise in pulling the rubber band. In one embodiment, the ring 23 is positioned on the site opposite to the securing member 30 and the tubular member 40 or the attaching member 44. In some embodiments the article of manufacture 10 may comprise at least one ring 24 on the tubular member 44. FIG. 1A shows an article of manufacture 10 comprises both ring 23 and ring 24. The ring 23 or 24 may be made of any suitable material, preferably having the strength to hold the string, cable or clip when being pulled by the user without being broken. In some embodiments, the ring 23 or 24 is made of metal.

In another embodiment, the present invention is directed to an article of manufacture for assisting a user to engage a handle, wherein the article comprises a proximal end 22 and a distal end 21, and (a) a body 20, wherein the body comprises x-, y- and z-directions, each of which is perpendicular to each other; (b) at least one securing member 30 for securing the body 20 to at least a portion of a limb of the user; and (c) an attaching member 44 for attaching to a detachable tubular member 40 at the distal end 21 of the article 10 for engaging a handle 51 or a clip connection. In some embodiments, the tubular member 40 comprises a complementary attaching member 45 for attaching to the article 10 at the distal end 21 of the article 10, a first end 41 and a second end 42, wherein at least one of said ends is open and engages said handle 51.

Exemplary Method of Making

The article of manufacture of the present invention may be constructed using any means or materials that are suitable. For example, body and/or tubular member may be made from a plastic or polymeric material, such as polyvinyl chloride (PVC) and polycarbonate, or other materials described herein. Further, the different components of the article of manufacture may be made with a single unit, or the
different components may be made from separate components and then attached using adhesive, bolts, fasteners, or any other suitable means that is known to those of skill in the art.

In one embodiment, construction of the article of manufacture may begin by creating a template to fit the dimensions of the subject. A first flat piece of plastic is cut to the approximate length and width of the intended user’s forearm. For example, in some embodiments the first plastic piece may have a length (from the proximal end 22 to the distal end 21) of from about 10 inches to about 16 inches and a width (from side 25 to side 26) of from about 1.5 inches to about 4 inches. An elastic sleeve unit which may fit snugly around the forearm of the user and which has a length that is less than or approximately equal to the length of the forearm of the user may be provided and adhesively attached such that the length of the sleeve is substantially parallel to the length of the first piece of plastic. In embodiments wherein a strap-type securing member is employed, the strap may be made of the same piece of material that constitutes the body or adhesively attached to the body of the article of manufacture 10, although one of skill in the art may appreciate that the strap may be fastened to the body 20 using buttons, locks, pins, hook-and-loop fastener or any other suitable fastening means.

In some embodiments, a user may be provided with two or more tubular members 40 on each arm wherein the tubular members 40 on each article of manufacture 10 is oriented such that the tubular member 40 of the article of manufacture 10 being used on the left arm may engage the left-side of the handle 51 and the tubular member 40 of the article of manufacture 10 being used on the right arm may engage the right-side of the handle 51. In cases where the tubular member 40 is rotatable, the tubular member can engage different types of exercise equipment 50 having handles 51 in different orientations without requiring the user to rotate his or her limb.

Non-limiting examples of exercise equipments 50 that are contemplated for use with the article of manufacture 10 of the present invention include, but are not limited to, curl machine, triceps extension machine, chest press, shoulder extension, lateral and side raises, lateral pulldown machine, row machine, low-row machine, and stationary bicycle. The present invention is envisioned to be useable with any piece of exercise equipment 50 or other device, such as a safety device that has a handle 51, cable, rubber band, or clip connections, or similar means.

FIG. 5 shows an exemplary embodiment of the article of manufacture 10 of the present invention as it may be used to engage a handle 51 of a piece of exercise equipment. In the embodiment shown in FIG. 5, the tubular member 40 has an open first end 41 and the dimensions of the opening of the first end 41 are such that the handle 51 may be fit into the opening of the first end 41 in such a way that the article of manufacture 10 secures the handle 51. It is thought that an appropriate, but not excessive, amount of clearance may be desirable between the opening of the first end 41 and the handle 51. One of skill in the art may appreciate that the amount of clearance that is appropriate will vary from one exercise machine to another and be heavily dependent on the type of exercise being performed.

Described and illustrated herein are several embodiments of an article of manufacture for assisting a patient or user to engage a handle or similar means. While particular embodiments of the invention have been described, it is not intended that the invention be limited thereto, as it is intended that the invention be as broad in scope as the art will allow and that the specification be read likewise. It will therefore be appreciated by those skilled in the art that yet other modifications could be made to the invention described herein without deviating from its spirit and scope as so claimed.

What is claimed is:

1. An article of manufacture for assisting a user in engaging a handle, which article of manufacture comprises a body, a securing member attached to the body, and an elongated hollow member attached to the body, wherein the article of manufacture is designed to allow the user to position his or her limb in the article of manufacture so that the securing member secures the user’s limb to the article of manufacture and the elongated hollow member can be slipped over the handle to secure it to the body.

2. The article according to claim 1, wherein the elongated member is a tubular member comprising a first and a second end, wherein at least one of said ends is open and engages said handle.
3. The article of manufacture of claim 1 for assisting a user to engage a handle and/or clip connection, wherein the article comprises a proximal end and a distal end, and:
   a) a body, wherein the body comprises x-, y- and z-directions each of which is perpendicular to each other;
   b) at least one securing member for securing the body to at least a portion of a limb of the user; and
   c) a tubular member positioned at or near the distal end of said body, wherein the tubular member comprises a first and a second end, wherein at least one of said ends is open and engages said handle.

4. The article according to claim 2, wherein the second end of the tubular member is open.

5. An article according to claim 1, wherein the elongated hollow member is not rotatable.

6. The article according to claim 1, wherein the elongated hollow member is rotatable.

7. The article according to claim 1, wherein at least one securing member is adjustable.

8. The article according to claim 1, wherein the body is rigid.

9. The article according to claim 1, further comprising a clearance between the body and the elongated hollow member such that the user may grasp the tubular member.

10. The article according to claim 1, wherein the article further comprises a ring.

11. The article according to claim 1, further comprising a gripping member attached to the body for being grasped by a hand of the user.

12. A method of engaging in a handle and/or clip connection by a user comprising:
   securing a portion of a limb of the user with the securing member of the article of claim 1;
   connecting the elongated hollow member of the article to the handle and/or clip connection;
   and engaging in pulling the handle and/or clip connection.

13. A method of engaging in a cable or an elastic string by a user comprising:
   securing a portion of a limb of the user in the securing member of the article of manufacture of claim 10;
   connecting the ring of the article to the cable or the elastic string;
   and engaging in pulling the cable or the elastic string.

14. An article of manufacture for assisting a user to engage a handle and/or clip connection, wherein the article comprises a proximal end and a distal end, and:
   a) a body, wherein the body comprises x-, y- and z-directions each of which is perpendicular to each other;
   b) at least one securing member for securing the body to at least a portion of a limb of the user; and
   c) an attaching member for attaching to a detachable elongated hollow member, wherein attaching member is positioned at or near the distal end of said body, wherein the elongated hollow member comprises a first and a second end, wherein at least one of said ends is open and engages said handle.

15. The article according to claim 14, wherein the elongated member is a tubular member.

16. The article according to claim 14, wherein the elongated hollow member is rotatable.

17. The article according to claim 14, wherein the securing member is adjustable.

18. The article according to claim 14, wherein the article further comprises a ring.

19. The article according to claim 14, further comprising a gripping member attached to the body for being grasped by a hand of the user.

20. A method of engaging in a handle and/or clip connection by a user comprising:
   attaching an elongated hollow member to the article;
   securing a portion of a limb of the user with the securing member of the article of claim 14;
   connecting the elongated hollow member of the article to the handle and/or clip connection; and engaging in pulling the handle and/or clip connection.

21. A method of engaging in a cable or an elastic string by a user comprising:
   securing a portion of a limb of the user in the securing member of the article of manufacture of claim 18;
   connecting the ring of the article to the cable or the elastic string;
   and engaging in pulling the cable or the elastic string.

22. An article of manufacture for assisting a user to engage a cable or an elastic string, wherein the article comprises a proximal end and a distal end, and:
   a) a body, wherein the body comprises x-, y- and z-directions, each of which is perpendicular to each other;
   b) at least one securing member for securing the body to at least a portion of a limb of the user; and
   c) at least one ring for connecting to the cable or the elastic string.

23. A method of engaging in a cable or an elastic string by a user comprising:
   securing a portion of a limb of the user in the securing member of the article of manufacture of claim 22;
   connecting the ring of the article to the cable or the elastic string;
   and engaging in pulling the cable or the elastic string.

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