ABSTRACT OF THE DISCLOSURE

A tubular torsion bar of rolled metal of an optimum length and girth with a bipartite wall having a longitudinal slit extending from end to end for optimum torsional resilience. Hand grips are provided on each end to permit the bar to be gripped and operated torsionally as an exercise apparatus for isotonic contraction and relaxation of muscles of the arms and shoulders by the repeated application and release of manual forces sufficient to substantially stress the bar torsionally in either one of both directions equally.

BACKGROUND OF THE INVENTION

A wide variety of manual exercise devices have been provided of physical and neurological values which serve in varying degrees to promote isotonic contraction and relaxation of the muscles of the fingers, wrists, forearms, elbows, upper arms and the shoulders of a person's body. Examples of the prior art would include coiled heavy spring wire having handles gripped by one hand and squeezing therby exercising the muscles of the hand, wrist and forearm. The movement is substantially planar. Resilient stretch devices with hand grips at each end are generally stretched in a direction laterally from the body to exercise the pectoralis and deltoid muscles and also the biceps brachii and triceps brachialis muscles of the upper extremity. Weight pulling and weight lifting devices generally including cords and pulleys, to exercise the triceps brachialis muscles, and, a variety of barbells, etc., raised to various heights and at various angles from the body only require an effort of constant magnitude throughout their movement.

All of these have limited application, or require extensive or built-in equipment and most are inconvenient for casual and repeated moments of use during the day. None of them have the quick appeal and interest of being taken from a table or drawer and used personally or competitively even in the middle of conferences with other people, dictation, or thoughtful relaxation. The abstraction of muscle movement even unconsciously, such as the wiggling of a foot while in thought, assists concentration and attentiveness essentially because of assisting blood circulation by muscle contraction and relaxation.

It is well known that muscle contraction is a series of "twitches" induced neurologically by rapidly recurrent impulses transmitted by motor nerves related to sensory perception, the duration and strength of which determines the extent and effort of contraction. In the present invention, all of the muscles mentioned are exercised in the repeated application of a manual force sufficient to subject the tubular bar embodying the invention to a substantial torsional stress in either direction, and alternately in both directions, within the capabaility of the bar without permanent deformation thereof. The longitudinal slit herein mentioned which gives the bar this property by permitting the edges defining the slit to move relative to each other in a planar-helical complex that is parallel to the longitudinal axis of the bar when the bar is subjected to torsional stress, distorts any given C cross section through the bar form a resting planar orientation to a helical three dimensional orientation under resilient tension. The edges defining the slit slide engage each other longitudinally and the C sectional form of the bar maintains them against off-setting and over-lapping each other against weakening of the bar under applied torsional stresses. The exercise bar provides an uncomplicated structure with minimum components and is completely safe for use by anyone. It further offers both ease and low cost of manufacture, as well as ease in packaging. Similarly, its light weight and its streamlined, compact form and size makes it easy to store and handle.

SUMMARY OF THE INVENTION

This invention relates to a tubular member of sheet metal strip roll-formed to a modified C cross-sectional shape with work hardened transversely stiffened corners or ribs of a girth comfortable to grip and of optimum length and resilience to handle. Hand grips are secured on each end and a straight-line longitudinal slit on one side only, extending from end to end, permit the edges defining the slit to slide relative to each other in a plane parallel to the longitudinal axis of the member when such member is twisted in either direction, the total relative rotation being within the range of 180° and depending on the effort exerted by the user in the application of a manual torsional force. The device is adapted for use as an apparatus for the exercise of the muscles of the upper extremity by promoting their isotonic contraction and relaxation.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the torsion bar exercise apparatus in its resting position illustrating the longitudinal slit from end to end;

FIG. 2 is a similar view of the torsion bar exercise apparatus in a tensioned position;

FIG. 3 is a cross-sectional view of the torsion bar exercise apparatus;

FIG. 4 is a cross-sectional view of an alternative embodiment of the torsion bar exercise apparatus;

FIG. 5 is a detailed view of a hand grip disposed on end of the torsion bar exercise apparatus;

FIG. 6 is a vertical sectional view taken along the line 6-6 of FIG. 5; and

FIG. 7 is a plan view of a torsion scale employed with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In describing the invention, an optimum length is approximately the overall distance between the shoulders of the user, and an optimum torsional resilience is the capability of the bar to withstand up to 180° total deflection from end to end without permanent deformation, the essential working rotational angle being that which the hands gripping the handles are capable of inducing when the forearms remain parallel.

In FIG. 1 the tubular bar 10 is shown in its resting position as gripped by fingers and hands 12 ready for exercising. The bar may be gripped with any side up but for convenience of description is shown with the side 14 observable which has the slit 20 defined by the side edges 16 extending the full length of the bar. For purposes of illustration and for competitive scoring, if desired, index marks 22 are shown as placed on opposite sides of the slit 20. In the resting position of the bar the marks are in registration with each other as shown. The single line index marks are representative of comparison scales 44 (FIG. 7) supplied on the article itself either by embossing or by decals 48 in which a center line 50 locates the
3,510,130
3 decal which then is severed therealong by a knife edge following the slit.

The longitudinal slit 20 is defined by the side edges 16 which permits the bar to be twisted about the longitudinal axis by the edges defining the slit sliding longitudinally relative to each other. The edges 16 abut and slide against each other and the extent of the longitudinal displacement of the edges is a measure of the extent the bar is twisted and the torsional effort exerted by the user.

The preferred cross-sectional form is shown in FIG. 3 which is essentially hexagonal with four major walls 24, including the wall 14 having the slit in it, and four minor walls 26 in the nature of recess mitered corners which provide work hardened ribs 28 in the form rolling thereof. The walls and corners cross-sectionally define a rectangular or square C-shaped rigidified by the work hardening against relative lateral displacement of the edges 16 in use. By way of example, a strip of .028" thick quarter-hard, cold-rolled steel strip approximately .259" wide is rolled to the shape shown in FIG. 3.

With moderate effort an average person can twist the bar to the extent shown in FIG. 2. The bar 10 shown in FIG. 4 has four instead of eight work hardened ribs 28, but dimensionally both provide a grip that is comfortable to grip for exercise and an excellent radius of gyration factor which prevents a bending of the bar, either under the end thrusts or laterally applied moments of force.

Although the bar can be gripped and twisted as described thus far, and is completely safe to handle in this form because the work hardened ribs will hold the sliding edges in abutting relation without permitting them to overlap under torsional stress, it is preferred to provide handles 30 as shown in FIGS. 5 and 6 for ease of gripping without slipping. The handles are of flexible material and are molded to provide “checkered” type gripping surfaces 32 to prevent slippage of the hand both in pulling and twisting. Annular ribs 36 and 38 provided at the ends of the handles assist in locating and holding the hands in proper position for all muscular exercises indicated and the outer ends 40 of the handles are closed by an integral end wall to protect both the hands and the bar ends against injury and damage.

Moreover, it will be observed that the tubular structure of the invention cannot be physically bent by the hands during muscular exercise, the radius of gyration being infinitely greater in preventing this than that which would be present with lesser girth and the same cross-sectional area of the metal present if the metal is present in the form of rod stock having a diameter approximately .300".

While the invention has been described in terms of a preferred embodiment and a modification thereof, its scope is not intended to be limited by the precise embodiment herein shown; and it is understood that details of the structures shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

What is claimed is:

1. An exercise bar for the muscles of the upper extremity comprising a tubular member of rolled metal of optimum length and resilience and of a girth, capable of being easily gripped manually at opposite ends, said member having at least four circumferentially spaced walls bordered by work hardened corners, one wall including opposing edges defining a slit between them extending longitudinally from end to end of said one wall to permit the member to be twisted in either direction equally about its longitudinal axis by the application of a manual torsional force at the opposite ends of said member with the opposing edges movable relative to each other, and means rigidifying said member against bending and holding said opposing edges in registry with each other comprising said plurality of corners.

2. An exercise bar as defined in claim 1 including hand grips of a resilient material enclosing the ends of said member and provided with an external checkered hand grip portion.

3. An exercise bar as defined in claim 1 wherein the edges defining the longitudinal slit are opposing each other in a common plane in abutting longitudinally sliding relationship to permit such member to be twisted from one position of relative rotation to an opposite position of relative rotation through a substantial angular deflection.

4. An exercise bar as defined in claim 1 wherein the edges defining the longitudinal slit abut each other against overlapping under torsional stress.

5. An exercise bar as defined in claim 1 wherein the metal comprising the rolled tubular member is quarter-hard cold-rolled steel strip with the crystal lattice constituting the work hardened corners oriented in a direction transverse to the grain of the strip.

6. An exercise bar as defined in claim 1 wherein the member is comprised of flat sides bordered by work hardened longitudinal ribs.

7. An exercise bar as defined in claim 1 including hand grips of a resilient material enclosing the end portions of said member, and resilient adhesive means securing said grips to said member for accommodating said relative movement of said opposing edges.

8. The exercise bar as defined in claim 1 wherein said opposing edges comprise the edges of cold-rolled steel strip and said member cross-sectionally defines an essentially octagonal form with four major walls and four minor walls in the nature of recess mitered corners which marginally provide work hardened ribs extending longitudinally of the member, said slit being in one of said major walls.

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