

(19) **DANMARK**

(10) **DK/EP 3525895 T3**



(12)

Oversættelse af europæisk patentskrift

Patent- og
Varemærkestyrelsen

-
- (51) Int.Cl.: **A 63 B 21/078 (2006.01)** **A 63 B 21/06 (2006.01)** **A 63 B 21/062 (2006.01)**
A 63 B 21/072 (2006.01) **A 63 B 21/075 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2021-09-06**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2021-07-21**
- (86) Europæisk ansøgning nr.: **17860885.7**
- (86) Europæisk indleveringsdag: **2017-10-09**
- (87) Den europæiske ansøgnings publiceringsdag: **2019-08-21**
- (86) International ansøgning nr.: **US2017055735**
- (87) Internationalt publikationsnr.: **WO2018071326**
- (30) Prioritet: **2016-10-13 US 201662407623 P**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
- (73) Patenthaver: **Hoist Fitness Systems, Inc., 11900 Community Road, Poway, CA 92064, USA**
- (72) Opfinder: **MEREDITH, Jeffrey, 13952 Mango Drive, Del Mar, California 92014, USA**
HOCKRIDGE, Bruce, 4963 Greenbrier Avenue, San Diego, California 92120, USA
- (74) Fuldmægtig i Danmark: **Zacco Denmark A/S, Arne Jacobsens Allé 15, 2300 København S, Danmark**
- (54) Benævnelse: **Rørstel til anvendelse med en træningsmaskine**
- (56) Fremdragne publikationer:
GB-A- 2 181 637
US-A- 2 643 170
US-A- 2 941 775
US-A- 3 707 273
US-A- 3 960 275
US-A- 4 527 797
US-A- 5 011 141
US-A- 5 170 898
US-A- 5 346 448
US-A- 5 472 103
US-A1- 2009 127 413
US-A1- 2010 213 149

DESCRIPTION

Technical Field:

[0001] The present system relates to rack-outs for use with weight-lifting exercise machines or weight-lifting bar storage racks.

Background Of The Invention:

[0002] An exercise machine and/or an exercise storage rack may include rack-outs for holding exercise equipment including free weights and/or assisted exercise bars. For example, rack-outs may be used on exercise storage racks for holding free weight equipment such as dumbbells and/or barbells. The use of rack-outs allow users to keep free weight equipment organized and helps to avoid hazards associated with equipment lying around on the floor. Rack-outs may also be used on exercise machines having assisted exercise equipment where exercise bars are physically attached to the exercise machine. In these configurations, use of rack-outs allow a user to rest an assisted bar on the rack-outs when the user is finished using it.

[0003] Whether the rack-outs are used for free weights or assisted weights, the rack-outs are subject to wear due to a high frequency of equipment placed on and off of them. Over time this can lead to damage of the covers that are placed over the rack-outs. There are many types of rack-outs on the market today, and they may use different configurations. However, most of them use polyurethane covers positioned over the edges of a laser cut steel plate. Unfortunately, these steel plates typically have high manufacturing costs as they are too thick to stamp out. In addition, these steel plates can often damage the polyurethane covers over time due to the high frequency of equipment placement upon the minimal edge surface area of the steel plates.

[0004] Accordingly, the need exists for a new rack-out design that helps to minimize damage to the polyurethane covers. In addition, the need exists for a cost-effective retail price point to allow integration of the rack-out designs into home and/or light commercial exercise machines.

[0005] US 3707273 discloses a shelf bracket cover, intended to be slipped over a shelf bracket after the shelf bracket has been secured to a support member.

[0006] US 5170898 discloses an I-beam fixture system including lockable bracket assemblies.

[0007] US2009/0127413 discloses a vertically stabilized shelf bracket assembly. A cover is provided in order to aesthetically enhance the shelf bracket assembly.

[0008] GB 2181637 discloses supporting post and bracket assemblies, intended principally for the field of merchandise display.

[0009] US 5472103 discloses a segmented shelving construction to be attached to a standard upright gondola construction.

Summary Of The Invention:

[0010] In a first aspect, the present system provides a weight exercise rack-out support apparatus as set out in independent claims 1 and 2.

[0011] In various embodiments, the rectangular cross sections are square cross sections, and the hollow support structure is positioned vertically. In the first aspect, the angled tubular member projects horizontally away from the hollow support structure.

[0012] In the first aspect, the cover has a downwardly shaped curved portion that is received over the upwardly curved free end of the tubular member. The cover may optionally be secured to the hollow support structure with screws.

[0013] In the first aspect, the support structure has a pair of slots on a side opposite to the aperture and the angled tubular member has end notches that are received into these slots. Preferably, the angled tubular member is welded into the aperture in the support structure, and/or the end notches on the angled tubular member are welded into the slots in the support structure. In alternate embodiments, an end cap can be disposed over the second aperture in the hollow support structure such that the end cap covers the open first end of the angled tubular member.

[0014] The present rack-out system has numerous advantages. First, the present rack-out system adds to the lifetime of an exercise machine and/or exercise equipment storage rack by providing a wide contact area between the cover and the solid top surface of the angled tubular member supporting the cover. This wide contact area helps to prevent tears to the polyurethane covers. Secondly, the present system is more cost effective for home and/or light commercial exercise machines and/or exercise equipment storage racks. This is due to the fact that each angled support member and associated rack-out cover can be separately attached to the vertical support member. In contrast, existing systems typically use large saw-tooth shaped cut out steel panels that stretch along the full height of the rack-out system. The present system completely advantageously avoids such large saw-tooth shaped laser cut out steel panels.

[0015] Also, the present system has rounded surface edges that are less likely to tear the covering materials upon impact with the edges. In addition, the present system offers the benefits of easier and cheaper manufacturing. For example, an angled tubular member as described herein is much easier to bend and cut as compared to a conventional cut-out steel

panel rack-out configuration. In a conventional rack-out configuration, the rack-outs are usually formed thick plates that may be 0.5 inches thick and must be laser cut as they are too thick to stamp out. In the above examples, the tubes are cheaper, easier to manufacture, better for maintaining covers, and may be used with home exercise equipment, and larger or smaller commercial equipment.

[0016] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the subject matter, nor is it intended to be used as an aid in determining the scope of the subject matter.

Brief Description of the Drawings:

[0017]

Fig. 1 is an exploded perspective view of an embodiment of the present tube rack-out system having a square hollow support structure and a square angled tubular member.

Fig. 2 is an assembled perspective view corresponding to Fig. 1 showing a first end of the angled tubular member received into the square aperture in the hollow support structure.

Fig. 3 is a front perspective view of the angled tubular member of Figs. 1 and 2.

Fig. 4 is a rear perspective view of the angled tubular member of Fig. 3.

Fig. 5A is a rear perspective view of an embodiment of the present tube rack-out system showing a pair of vertical slots on the hollow support structure into which are received a pair of notches on the angled tubular member.

Fig. 5B is a cross-sectional top view of the embodiment of the present tube rack-out system of Fig. 5A.

Fig. 6 is a rear perspective view of an embodiment of the present tube rack-out system having end caps over apertures in the back wall of the hollow support structure.

Fig. 7 is an exploded front perspective view of the present tube rack-out system showing a cover passing over the angled tubular member and attached onto the hollow support structure.

[0018] Throughout the drawings and the detailed description, unless otherwise described, the same drawing reference numerals will be understood to refer to the same elements, features, and structures. The relative size and depiction of these elements may be exaggerated for clarity, illustration, and convenience.

Detailed Description Of The Drawings:

[0019] The foregoing summary, as well as the following detailed description, will be better understood when read in conjunction with the appended drawings. For the purpose of illustration, certain embodiments of the present invention are shown in the drawings. It should be understood, however, that the invention is not limited to the precise arrangements and embodiments shown. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate an implementation of systems, apparatuses, and methods consistent with the present description and, together with the description, serve to explain advantages and principles consistent with the invention.

[0020] The embodiments of the present invention will now be described more fully with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. The following detailed description is provided to assist the reader in gaining a comprehensive understanding of the methods, apparatuses, and/or systems described herein. This invention may, however, be embodied in many different forms and should not be construed as limited to the illustrated embodiments set forth herein. Accordingly, various changes, modifications, and equivalents of the systems, apparatuses and/or methods described herein will be suggested to or understood by those of ordinary skill in the art. Also, descriptions of well-known functions and constructions may be omitted for increased clarity and conciseness.

[0021] In the following description, like reference characters designate like or corresponding parts throughout the figures. It is to be understood that the phraseology and terminology used in the following description are used for the purpose of description and enablement, and should not be regarded as limiting. Additionally, in the following description, it is understood that terms such as "top," "bottom," "side," "front," "back," "inner," "outer," and the like, are words of convenience and are not to be construed as limiting terms.

[0022] Figs. 1 and 2 are perspective views of an embodiment of the present tube rack-out system 100 comprising a support structure 102 and an angled tubular member 101. Optionally, support structure 102 and angled tubular member 101 are both square in cross-section as illustrated. However, it is to be understood that the present system is not so limited and that other hollow rectangular shapes or non-rectangular shapes may also be used instead.

[0023] Support structure 102 may have a first exterior wall 103 which preferably has a first mount hole 104 an aperture 105 and a second mount hole 106, positioned as shown. Fig. 1 shows an exploded perspective view and Fig. 2 shows an assembled perspective view (in which a first end of angled tubular member 101 is received into aperture 105). Subsequent to its insertion, angled tubular member 101 may be held in position by welding along first weld line 200.

[0024] Figs. 3 and 4 show front and rear perspective views of the angled tubular member 101 of Figs. 1 and 2. As seen in Fig. 3, angled tubular member 101 has a first end 300 and a

second (free, angled) end 301. The first end 300 is preferably straight and may preferably extend horizontally, or perpendicular to, support structure 102. The second end 301 is curved upwardly as shown such that second end 301 may be positioned higher from the ground than first end 300. It is to be understood that the angle of curvature of upwardly curved end 301 need not be exactly as shown. Specifically, the angle of curvature may be more or less than the illustrated embodiment, and the bend may be smooth and curvilinear as shown or may change direction at a more abrupt angle. Preferably as well, angled tubular member 101 may have rounded edges 302 onto which covers (701 in Fig. 7) are placed.

[0025] In preferred configurations, support structure 102 is positioned vertical to the ground and the first end 300 of angled tubular member 101 will therefore be positioned horizontal to the ground. It is to be understood, however, that the present system is not so limited. For example, support structure 102 may instead be tilted backwardly somewhat such that free end 301 of angled tubular member 101 will be positioned even higher than it would have been positioned above first end 300 if support structure 102 were simply vertical.

[0026] As seen in Fig. 4, angled tubular member 101 may also have vertical notches 400 and 401. Fig. 5A shows a pair of vertical slots 502 and 503 on support structure 102 into which vertical notches 400 and 401 can optionally be received. Fig. 5B is a cross-sectional top view also showing how vertical notches 400 and 401 (Fig. 4) can be received into vertical slots 502 and 503, respectively. As also seen in Figs. 5A and 5B, the vertical support member can itself have a non-rectangular cross-section with opposite straight walls 301 and 501 with curved side walls therebetween. As can also be seen, subsequent to the insertion of vertical notches 400 and 401 into vertical slots 502 and 503, the first end 300 of angled tubular member 101 will be flush with the exterior of side wall 501. Optionally, welding may be performed along vertical slots 502 and 503 in order to secure angled tubular member 101 into support structure 102.

[0027] Fig. 6 is a rear perspective view of an alternate embodiment of the present tube rack-out system 600 having end caps 603 positioned over the apertures in the back wall 601 of the hollow support structure 106. Specifically, hollow support structure 106 may have a second aperture (not shown, found immediately behind end cap 603). In this configuration, first end 301 of angled tubular member 101 may be inserted into aperture 105 and project out of the second aperture on hollow support structure 106. Next, end cap 603 may be inserted into the open tubular end of first end 301 of angled tubular member 101, or end cap 603 may simply cover the open tubular end of first end 301 of angled tubular member 101. Optionally, end cap 603 may be welded into position along weld line 604. In other embodiments, end cap 603 may simply be a plastic insertion piece.

[0028] Fig. 7 is an exploded front perspective view of the present tube rack-out system 700 showing a cover 701 passing over the angled tubular member 101 and attached onto the hollow support structure 106. Cover 701 optionally has a first cover mount hole 702 and a semicircular cover mount hole 703. Cover 701 passes over the upper surface of the angled tubular member 101, and cover 701 is connected directly onto the hollow support structure 106. As can be seen, cover 701 preferably has a downwardly shaped curved portion that is

received over the upwardly curved free end of angled tubular member 101. As such, when a weight bar (e.g.: barbell or a dumbbell) is placed on top of cover 701, the weight bar is fully supported by the upper surface of angled tubular member 101 immediately below cover 701. Optionally, cover 701 can be made of polyurethane, or other suitable material.

[0029] The first cover mount hole 702 may preferably align with the first mount hole 104 of the first exterior wall 103 of support structure 102. Securing mechanism 704 may be inserted through first cover mount hole 702 and first mount hole 104 to secure rack-out cover 701 to the first exterior wall 103 of support structure 102. A second, similar securing mechanism (not shown) may also be inserted through semicircle cover mount hole 703 and second mount hole 106 to further secure rack-out cover 701 to the first exterior wall 103 of support structure 102.

[0030] In various exemplary embodiments, the cross section of the angled tubular member 101 may be a 1 inch squared cross section. However, the cross sectional shape of angled tubular member 101 is not limited thereto. For example, the cross sectional dimensions may include at least 0.5 square inches, at least 1 square inch, at least 1.5 square inches, at least 2 square inches, at least 2.5 square inches, at least 3 square inches, at most 0.5 square inches, at most 1 square inches, at most 1.5 square inches, at most 2 square inches, at most 2.5 square inches, or at most 3 square inches.

[0031] In other examples, members 101 and 106 may each have cross-sections that are rectangular, rather than a square, with sides that have at least a 1.5:1 ratio, at least a 2:1 ratio, at least a 2.5:1 ratio, at least a 3:1 ratio, at least a 3.5:1 ratio, at least a 4:1 ratio, at least a 4.5:1 ratio, at least a 5:1 ratio, at most a 1.5:1 ratio, at most a 2:1 ratio, at most a 2.5:1 ratio, at most a 3:1 ratio, at most a 3.5:1 ratio, at most a 4:1 ratio, at most a 4.5:1 ratio, or at most a 5:1 ratio.

List of Reference Numerals:

[0032]

- 100
 - rack-out system
- 101
 - angled tubular member
- 102
 - support structure
- 103
 - first exterior wall
- 104
 - first mount hole
- 105
 - aperture

- 106
 - second mount hole
- 200
 - first weld line
- 300
 - first end of angled tubular member
- 301
 - second end of angled tubular member
- 302
 - round edge of angled tubular member
- 400
 - first vertical notch on angled tubular member
- 401
 - second vertical notch on angled tubular member
- 501
 - second slotted exterior wall on support structure
- 502
 - first vertical slot on support structure
- 503
 - second vertical slot on support structure
- 600
 - end cap rack-out assembly
- 601
 - second exterior wall of support structure
- 602
 - second rack hole of support structure
- 603
 - end cap
- 604
 - second weld line
- 700
 - cover mounting assembly
- 701
 - rack-out cover
- 702
 - first cover mount hole of support structure
- 703
 - semicircle cover mount hole of support structure
- 704
 - securing mechanism

[0033] The list of reference numerals is provided for convenience and is intended to aid

understanding of the illustrated examples described above. The examples of the present invention may be described in many different forms and should not be construed as limited to the illustrated examples. Likewise, the list above setting forth the reference numerals and associated components comprising the illustrated examples do not limit the scope of the invention.

[0034] One of skill in the art will recognize that the examples described above are not limited to any particular size, and the size of the exercise machine will depend upon the particular application and intended components. It will be appreciated by those skilled in the art that changes could be made to the examples described above without departing from the broad inventive concept thereof. It is understood, therefore, that the invention disclosed herein is not limited to the particular examples disclosed, and is intended to cover modifications of the present invention.

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US3707273A **[0005]**
- US5170898A **[0006]**
- US20090127413A **[0007]**
- GB2181637A **[0008]**
- US5472103A **[0009]**

Patentkrav

1. Vægttræningsstel-understøtningsindretning (100) omfattende:

en hul støttestruktur (102) med en åbning (105) deri;

5 et vinklet element (101), hvor det vinklede element (101) har en første ende, der modtages i åbningen (105) i den hule støttestruktur (102) og en anden ende, der er vinklet opad; og

en afdækning (701), der går hen over en øvre flade af det vinklede element (101), hvor afdækningen (701) er direkte forbundet med den hule støttestruktur (102),

10 **kendetegnet ved, at** det vinklede element er et vinklet rørformet element, og den hule støttestruktur (102) har et par spalter (502, 503) på en side modsat åbningen (105), og det vinklede rørformede element (101) har indhak (400, 401) derpå, der modtages i spalterne (502, 503),

15 hvor den første ende af det vinklede rørformede element er lige, hvor den første ende strækker sig horisontalt fra, eller vinkelret på, den hule støttestruktur (102), og den anden ende af det vinklede rørformede (101) er en opadgående krum fri ende, således at den anden ende under anvendelse er positioneret højere over jorden end den første ende,

20 hvor afdækningen (701) har en nedadgående formet krum del, der modtages over den opadgående krumme frie ende af det vinklede rørformede element (101), og

25 en vægtstang er under anvendelse placeret oven på afdækningen, og vægtstangen understøttes fuldstændig af den øvre overflade af det vinklede rørformede element lige under afdækningen.

2. Vægttræningsstel-understøtningsindretning (100) omfattende:

en hul støttestruktur (102) med en åbning (105) deri;

30 et vinklet element (101), hvor det vinklede element (101) har en første ende, der modtages i åbningen (105) i den hule støttestruktur (102) og en anden ende, der er vinklet opad; og

en afdækning (701), der går hen over en øvre flade af det vinklede element (101), hvor afdækningen (701) er direkte forbundet med den hule støttestruktur (102),

kendetegnet ved, at

5 det vinklede element er et vinklet rørformet element (101), og
den hule støttestruktur (102) har en anden åbning modsat den første åbning
(105), endvidere omfattende en endekappe (603), der er anbragt over den an-
den åbning og forbundet med den første ende af det vinklede rørformede ele-
ment (101), hvor den første ende af det vinklede rørformede element er lige,
hvor den første ende strækker sig horisontalt fra, eller vinkelret på, den hule
10 støttestruktur (102), og den anden ende af det vinklede rørformede (101) er en
opadgående krum fri ende, således at den anden ende under anvendelse er
positioneret højere over jorden end den første ende,
hvor afdækningen (701) har en nedadgående formet krum del, der modtages
over den opadgående krumme frie ende af det vinklede rørformede element
(101), og en vægtstang under anvendelse er placeret oven på afdækningen,
og vægtstangen understøttes fuldstændig af den øvre overflade af det vinklede
15 rørformede element lige under afdækningen.

3. Indretning ifølge krav 1 eller 2, hvor støttestrukturen (102) har et rektangu-
lært tværsnit.

20 **4.** Indretning ifølge krav 1 eller 2, hvor støttestrukturen (102) er et vertikalt ele-
ment.

5. Indretning ifølge krav 1 eller 2, hvor det vinklede rørformede element (101)
har et rektangulært tværsnit.

25 **6.** Indretning ifølge krav 5, hvor åbningen (105) i støttestrukturen (102) er rek-
tangulær.

7. Indretning ifølge krav 1 eller 2, hvor det vinklede rørformede element (101)
30 er svejset ind i åbningen (105) i støttestrukturen (102).

8. Indretning ifølge krav 1 eller 2, hvor den første ende af det vinklede rørfor-
mede element (101) er vinkelret på den hule støttestruktur (102).

9. Indretning ifølge krav 1 eller 2, hvor den første ende af det vinklede rørformede element (101) er horisontalt og den hule støttestruktur (102) er vertikal.

10. Indretning ifølge krav 1 eller 2, hvor afdækningen (701) er fremstillet af polyurethan.

DRAWINGS

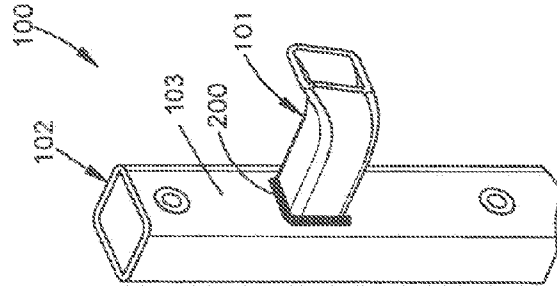


Fig.2

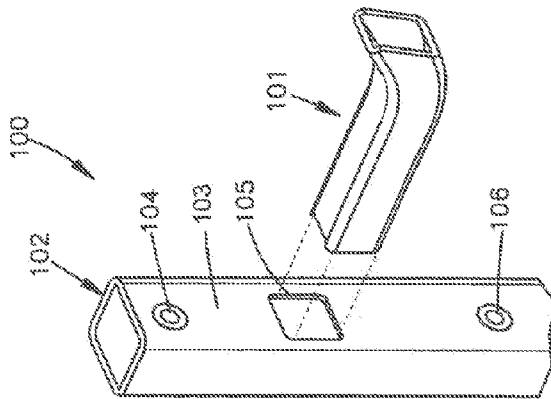


Fig.1

