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(54) **SUPPORTING MODULE FOR SUPPORTING AT LEAST AN ANNULAR REEL OF A BAND, SUPPORT GROUP COMPRISING SAID MODULE AND KIT FOR MOVING AT LEAST ONE ANNULAR REEL OF A BAND**

(57) Supporting module for supporting at least one annular reel (2) of a band, comprising a main body (7) provided with a housing seat (8), which comprises at least two supporting elements (20) arranged at a given dis-

tance (D) from each other and configured to support respective portions of an outer annular peripheral edge (6) of at least one reel (2).

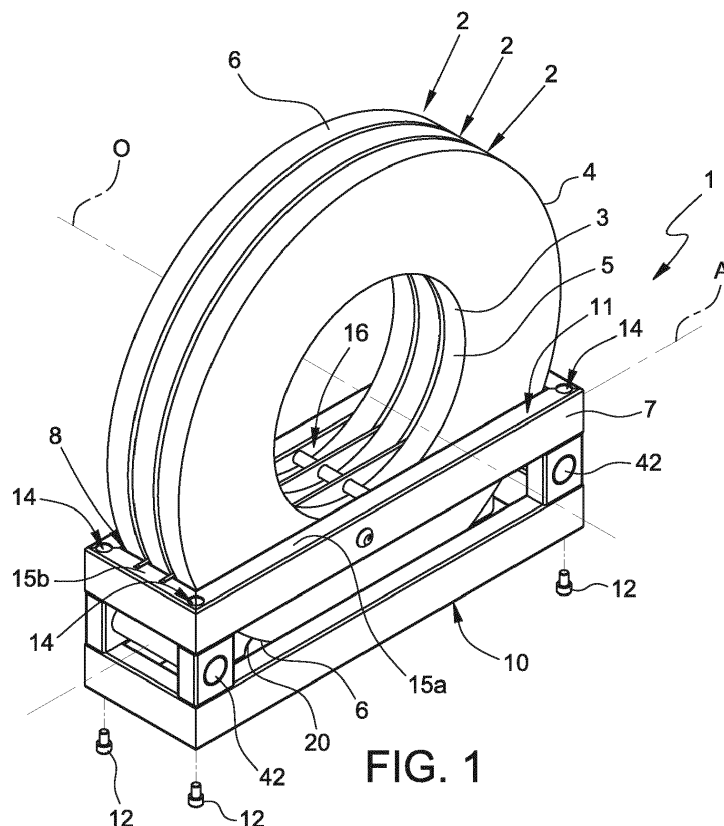


FIG. 1

Description

PRIORITY CLAIM

[0001] *This application claims priority from Italian patent application no.102017000051185 filed on 11/05/2017.*

DESCRIPTION

[0002] The present invention relates to a supporting module for supporting at least one annular reel of a band and a supporting assembly comprising said module.

[0003] The present invention also relates to a kit for moving at least one annular reel of a band.

[0004] In particular, the present invention is suitably used with reels of a specific band, commonly known as a strap or "strapping".

[0005] Straps are strips made of metal or of resistant plastic, generally used to fasten one or more loads, e.g. on a pallet, or to close a package for fastening it or for anti-theft security purposes.

[0006] Normally, this type of band is sold and marketed in the form of annular reels. Basically, the reel of a band is defined by an annular core around which the band (or strap) is wound.

[0007] The reels of a band can have different size and weight.

[0008] Some reels of a band have considerable weight and size, especially if the band is made of metallic material. In these cases, moving the reels of a band is difficult and can also prove to be dangerous for the operators moving them.

[0009] It is therefore an object of the present invention to provide a supporting module for supporting at least one reel of a band, which is easily manoeuvrable and which, at the same time, guarantees the safety of the operators moving the reels.

[0010] In accordance with these aims, the present invention relates to a supporting module for supporting at least one annular reel of a band comprising a main body provided with a housing seat, which comprises at least two supporting elements arranged at a given distance from each other, and configured to support respective portions of an outer annular peripheral edge of at least one reel.

[0011] It is a further object of the present invention to provide a supporting assembly, which is also easily manoeuvrable and which simplifies the moving operations of the reels of the band.

[0012] In accordance with these aims, the present invention relates to a supporting assembly as claimed in claim 9. Finally, it is a further object of the present invention to provide a kit for moving at least one annular reel of a band, which simplifies the moving operations of the reels of band.

[0013] In accordance with these aims, the present invention relates to a kit for moving at least one annular

reel of a band as claimed in claim 12.

[0014] Further characteristics and advantages of the present invention will clearly appear from the following description of a non-limiting embodiment thereof, with reference to the figures of the accompanying drawings, in which:

- Figure 1 is a schematic perspective view, with parts removed for clarity's sake, of a supporting module for at least one reel of a band according to the present invention;
- Figure 2 is a schematic perspective view, with parts removed for clarity's sake, of the module of Figure 1 shown from a different angle;
- Figure 2a is a schematic perspective view, with parts removed for clarity's sake, of a supporting module for at least one reel of a band according to a variant of the present invention;
- Figure 3 is a sectional view of a detail of the module of Figure 1 and of Figure 2;
- Figure 4 is a perspective view of a supporting assembly, with parts removed for clarity's sake, according to the present invention;
- Figure 5 is a schematic perspective view of a kit for moving at least one annular reel of a band according to the present invention according to a first embodiment and a first operating configuration;
- Figure 6 is a schematic perspective view of the kit for moving at least one annular reel of a band of Figure 5 in a second operating configuration;
- Figure 7 is a schematic perspective view of a kit for moving at least one annular reel of a band according to the present invention according to a second embodiment.

[0015] In Figure 1, reference number 1 indicates a supporting module 1 to support at least a reel of a band 2 according to the present invention.

[0016] In the non-limiting example here described and shown, the supporting module 1 is configured to support three reels 2 arranged side by side, as described in more detail below.

[0017] Each reel 2 comprises an annular core 3 around which a band 4 is wound. The annular core 3 extends around a main axis O.

[0018] The core 3 defines an inner annular peripheral edge 5 of the reel 2, while the last wrapped band layer 4 defines an outer annular peripheral edge 6 of the reel 2.

[0019] The module 1 comprises a main body 7, which is provided with a housing seat 8, which at least partially houses a reel 2.

[0020] With reference to Figure 1 and to Figure 2, the main body 7 is substantially shaped like a parallelepiped and has an elongated shape along a longitudinal axis A.

[0021] The main body 7 has a bottom face 10 (not clearly shown in the attached figures) and a top face 11.

[0022] The bottom face 10 is a substantially supporting face and is preferably provided with four legs 12 (partially

shown in Figure 1) arranged substantially at the corners of the bottom face 10.

[0023] The top face 11 is preferably provided with four holes 14, substantially arranged at the corners of the top face 11. Preferably, the holes 14 are arranged and shaped so as to be engaged by the respective legs 12 of a further module 1. Basically, the legs 12 and the holes 14 allow a stable and secure stacking of the modules 1.

[0024] This allows obtaining a storage of the modules 1, which is comfortable, safe and aimed at reducing to a minimum the overall dimensions.

[0025] Furthermore, the legs 12 also allow a stable support on a plane and/or the coupling with other elements, as described hereinafter.

[0026] The housing seat 8 is formed in the main body 7, is substantially delimited by two axial walls 15a and by two side walls 15b, which are substantially orthogonal to the axial walls 15a, and has an opening 16 along the top face 11.

[0027] Preferably, the housing seat 8 has a further opening 17 along the bottom face 10. Basically, in the non-limiting example here described and shown, the housing seat 8 is defined by a slit passing through the main body 7 from the top face 11 to the bottom face 10.

[0028] The housing seat 8 comprises at least two supporting elements 20 (better shown in Figure 2) arranged at a given distance D from each other and configured to support respective portions of the outer annular peripheral edge 6 of at least one reel 2 (partially shown in Figure 1).

[0029] In detail, each supporting element 20 is defined by a pin, preferably having a circular section, which extends substantially orthogonal to the longitudinal axis A between the axial walls 15a and is supported by the axial walls 15a.

[0030] Preferably, each supporting element 20 is provided with at least one roller 21 to allow the outer annular peripheral edge 6 of the reel 2 to slide on it.

[0031] In the non-limiting example here described and shown, the housing seat 8 is further provided with at least one partition element 24, which axially divides the housing seat 8 into portions 25, each of which is configured to house a respective reel 2.

[0032] In the non-limiting example here described and shown, the housing seat 8 comprises two partition elements 24, which define three portions 25.

[0033] Each partition element 24 is defined by a plate removably coupled to the main body 7. Preferably, each partition element 24 engages respective grooves 26 formed along the side walls 15b of the housing seat 8.

[0034] The supporting elements 20 are aligned along an axis, which is arranged substantially horizontally when the module 1 is in use (i.e. when the module 1 is resting on a horizontal plane). In this way, the main axis O of the reel 2 supported by the module 1 is substantially horizontal too.

[0035] The main body 7 is further provided with a locking device 30, configured to selectively lock at least one

reel 2 in the housing seat 8.

[0036] In particular, the locking device 30 is arranged so as to cooperate with the inner annular peripheral edge 5 of the reel 2 to be locked.

[0037] In detail, the locking device comprises a locking pin 31, which extends along an axis B between the axial walls 15a of the main body inside the housing seat 8 and is fastened to the axial walls 15a.

[0038] Preferably, the ends of the locking pin 31 are housed in respective holes 33 (only one of which is shown in Figure 3) formed in the axial walls 15a of the housing seat 8.

[0039] In use, the locking pin 31 passes through the reel 2 or the reels housed in the housing seat 8. In this way, the reel 2 is locked in the housing seat 8.

[0040] Preferably, the axis B is substantially orthogonal to the axis A.

[0041] The locking device 30 is selectively removable to allow the removal and housing of the reels 2 inside the housing seat 8.

[0042] For example, the lock pin 31 can be pulled out of one of the holes 33. A variant not shown provides that the lock pin 31 has a telescopic portion.

[0043] Preferably, the locking device 30 is provided with a closing system 35 (better shown in Figure 3) configured to selectively prevent the removal of the locking device 30.

[0044] In the non-limiting example here described and shown in Figure 3, the closing system 35 comprises a lever 37, rotatable about an axis C parallel to the axis B and movable between a locking position, in which the lever 37 engages a respective groove 38 of the locking pin 31 to prevent its movements along the axis B, and a release position, in which the lever 37 does not engage the groove 38 and the locking pin 31 can freely move along the axis B. Preferably, the closing system 35 comprises a lock 40 to lock the lever 37 in the locked position.

[0045] With reference to Figure 1, the main body 7 is further provided with at least a pair of holes 42, formed along at least one outer face 43 of the axial walls 15a, which, as described in detail below, are configured to be engaged by respective coupling elements.

[0046] Figure 2a shows a variant of the module indicated by the reference number 100. Figure 2a uses the same reference numbers of Figures 1 and 2 to indicate same or similar parts. The module 100 differs from the module 1 for the presence of at least one wheel 101 along the bottom face 10. In the non-limiting example here described and shown, the bottom face 10 is provided with a pair of wheels 101 arranged side by side along one of the side walls 15b. A variant not shown provides that at least one further wheel is arranged on the other side wall 15b along the bottom face 10.

[0047] Advantageously, the wheels 101 on the bottom face 10 allow an agile transport of the module 100. In particular, the transport is even more agile if the module 100 is coupled to an accessory 110 provided with two hooking arms 112 and with at least one holding element

113.

[0048] As shown in Figure 2a, the hooking arms 112 engage two respective holes 14 (better shown in Figure 2) on the top face 11 and are shaped so that the holding element 113 does not obstruct the positioning of the reel (not shown in Figure 2a) in the housing seat 8. In other words, the hooking arms 112 are arranged so that the holding element 113 is not arranged above the housing seat 8 (loading/unloading and transport configuration). In use, the user grasps the holding element 113, slightly raises the module 100 and drags it to the desired location. Once in the desired place, the presence of only two wheels 101 guarantees a stable and secure support of the module 100.

[0049] The accessory 110 is preferably provided with hooking arms 112 that can also be coupled to the module so that the holding element 113 is arranged above the reel (not shown in Figure 2a) in a stable operating configuration (configuration represented with a dotted line).

[0050] In the non-limiting example shown in Figure 2a, moreover, the module 100 has no partition element in the housing seat 8. The absence of the partition elements makes the module 100 particularly suitable for housing plastic reels. Figure 4 shows a supporting assembly 50 for supporting a plurality of reels 2.

[0051] The supporting assembly 50 comprises a supporting structure 51 and at least one module 1 coupled to the supporting structure 51.

[0052] The supporting structure 51 comprises a preferably rectangular frame 53 and two supporting elements 54 coupled to the frame 53 and configured to rest on a supporting plane.

[0053] The frame 53 is provided with a supporting face 55, coupled to the supporting elements 54, and a coupling face 56, opposite the supporting face 55 and configured to be coupled to one or more supporting modules 1.

[0054] Along the coupling face 56, the frame 53 is provided with a plurality of first coupling elements 58, suitably arranged to cooperate with respective second coupling elements 12 of the modules 1.

[0055] In the non-limiting example here described and shown, the frame 53 is provided with a plurality of holes 58, suitably arranged to cooperate with the respective legs 12 of the modules 1.

[0056] Basically, the holes 58 are shaped so as to house the legs 12 of a plurality of modules 1 and are arranged so that the modules 1 are arranged side by side along the frame 53.

[0057] In particular, the holes 58 are divided into groups of four holes 58. Each group of holes 58 comprises four holes 58 arranged at the corners of a rectangle sized to reflect the position of the legs 12 of the modules 1.

[0058] The groups of holes 58 are arranged side by side along the frame 53.

[0059] In this way, in use, the supporting structure 51 supports a plurality of adjacent modules 1, permanently coupled to the supporting structure 51 as shown in Figure 5.

[0060] The modules 1 can be uncoupled one by one from the supporting structure 51, e.g. by means of a hooking device 60 (shown in Figures 5 and 6) and/or moved by means of a carriage 61.

[0061] The hooking device 60 is provided with two hooking arms 62 and with a holding element 63 configured to be coupled to a motorized moving device. For example, the holding element 63 can be coupled to the arms of a forklift (not shown in the attached figures for simplicity's sake).

[0062] The hooking arms 62 are shaped to engage, in use, the coupling holes 42 of the modules 1.

[0063] The holding element 63 is defined in the non-limiting example here described and shown by a hollow body provided with a through channel 65 configured to house at least one arm of the forklift.

[0064] As shown in Figure 6, the coupling between the module 1 and the hooking device 60 takes place by means of the hooking arms 62 and the module 1 is moved thanks to the forklift (not shown).

[0065] As an alternative to the forklift or in combination with it, each module 1 can also be coupled to the carriage 61 shown in Figure 7.

[0066] Advantageously, the carriage 61 is provided with two hooking elements 68, configured to engage the coupling holes 42, with at least two wheels 69 and with at least two grip knobs 70.

[0067] In the non-limiting example here described and shown, the carriage 61 is further provided with at least one box 71 for storing tools.

[0068] A variant, not shown, provides that the carriage 61 is further provided with a band cutting device 4.

[0069] Advantageously, the kit comprising the supporting assembly 50, the hooking device 60 and/or the carriage 61 allows an easy and safe movement of the reels 2 of the band 2, especially when the reels 2 are large and have a considerable weight.

[0070] Thanks to the kit according to the present invention and thanks to the fact that the module 1 supports the reels 2 with the main axis O horizontal, the operator must not lift weights or move each reel 2.

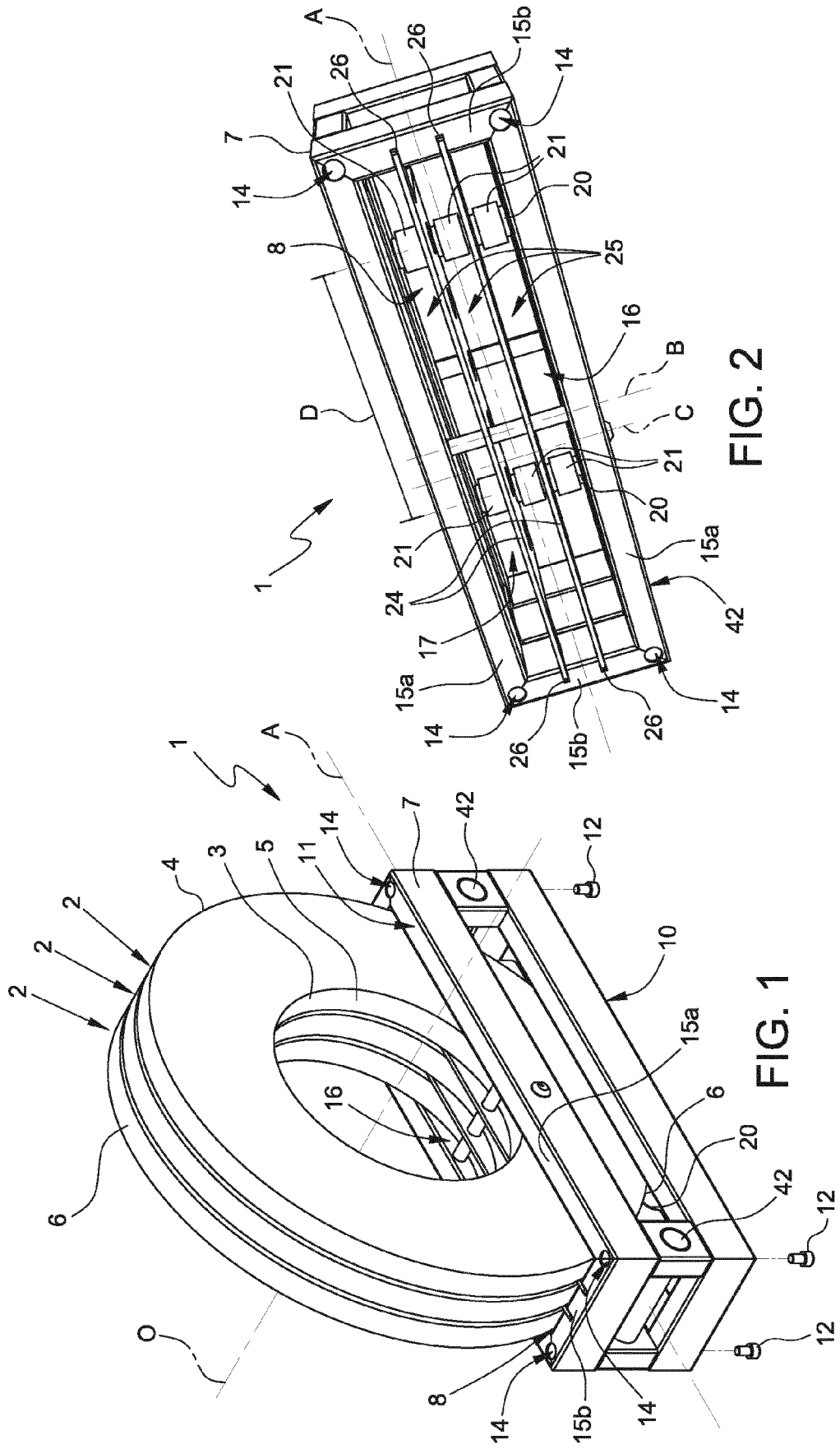
[0071] The supplier of reels 2 can in fact directly supply the modules 1 coupled to the reels 2 or even the supporting assemblies 50 coupled to the reels 2. In this way, the operator will move the reels 2 exclusively by means of the tools provided by the kit according to the present invention. This entails a considerable reduction in the risk of accidents at work for the operators.

[0072] Finally, it is clear that modifications and variations can be made to the apparatus and method herein described without departing from the scope of the appended claims.

55 Claims

1. Supporting module for supporting at least one annular reel (2) of a band (4), comprising a main body (7)

- provided with a housing seat (8), which comprises at least two supporting elements (20) arranged at a given distance (D) from each other and configured to support respective portions of an outer annular peripheral edge (6) of at least one reel (2). 5
2. The module according to claim 1, wherein each supporting element (20) is provided with at least one roller (21) to allow the outer annular peripheral edge (6) to slide on said roller (21). 10
 3. The module according to claim 1 or 2, wherein each supporting element (20) extends along a respective axis, which is substantially horizontal when the supporting module (1) is in use. 15
 4. The module according to any one of the preceding claims, wherein the main body (7) is provided with a locking device (30) configured to selectively lock at least one reel (2) in the housing seat (8). 20
 5. The module according to claim 4, wherein the locking device (30) is removable.
 6. The module according to claim 5, wherein the locking device (30) is provided with a closing system (35) configured to selectively prevent the removal of the locking device (30). 25
 7. The module according to any one of claims from 4 to 6, wherein the locking device (30) is arranged so as to cooperate with an inner annular peripheral edge (5) of the reel (2) housed in the housing seat (8). 30
 8. The module according to any one of the preceding claims, provided with a bottom face (11), which suitably faces a supporting plane of the module (1; 100), and with at least one wheel (101) arranged along the bottom face (11) . 35
 9. The module according to any one of the preceding claims, comprising at least one partition element (24), which divides the housing seat (8) in portions (25), each of which is shaped so as to house a respective reel (2). 40
 10. Supporting assembly comprising:
 - at least one supporting structure (51);
 - at least one supporting module (1) for supporting at least one annular reel (2) of a band (4) as claimed in anyone of the preceding claims; the supporting module (1) being coupled to the supporting structure (51). 45
 11. The assembly according to claim 10, comprising a plurality of supporting modules (1) arranged side by side and coupled to the supporting structure (51). 50
 12. The assembly according to claim 10 or 11, wherein the supporting structure (51) comprises a frame (53) provided with a coupling face (56) configured to be coupled to one or more supporting modules (1); the frame (53) being provided along the coupling face (56) with a plurality of first coupling elements (58), which are suitably arranged to cooperate with respective second coupling elements (12) of the modules (1). 55
 13. Kit for moving at least one annular reel (2) of a band (4) comprising: a supporting assembly (50) as claimed in any one of claims from 9 to 11; at least one hooking device (60) configured to hook at least one supporting module (1) of the supporting assembly (50); and/or at least one carriage (61) configured to be coupled to at least one supporting module (1) of the supporting assembly (50) and to move the supporting module (1) it is coupled to.
 14. The kit according to claim 12, wherein the hooking device (60) is provided with two hooking arms (62), shaped so as to engage, in use, respective coupling holes (42) of the supporting module (1) to be hooked, and with an holding element (63) configured to be coupled to a motorized moving device.



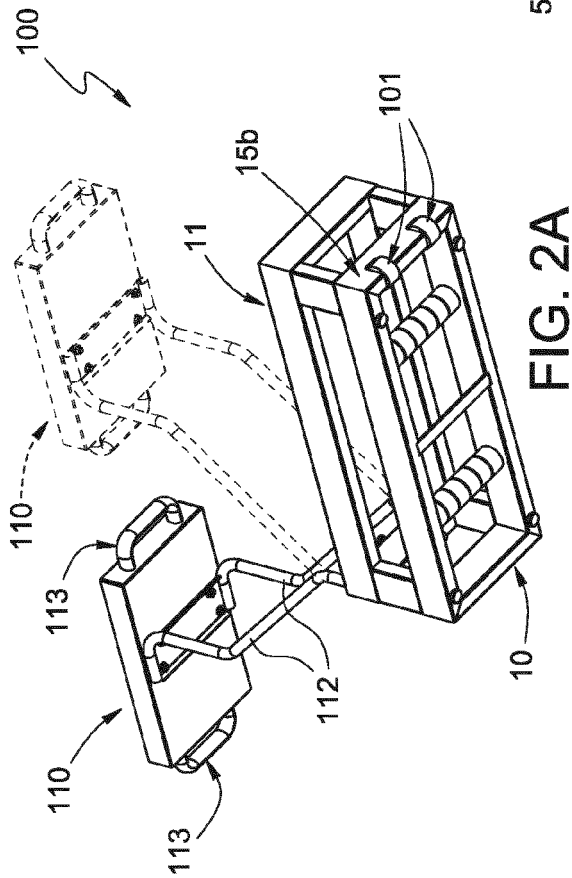


FIG. 2A

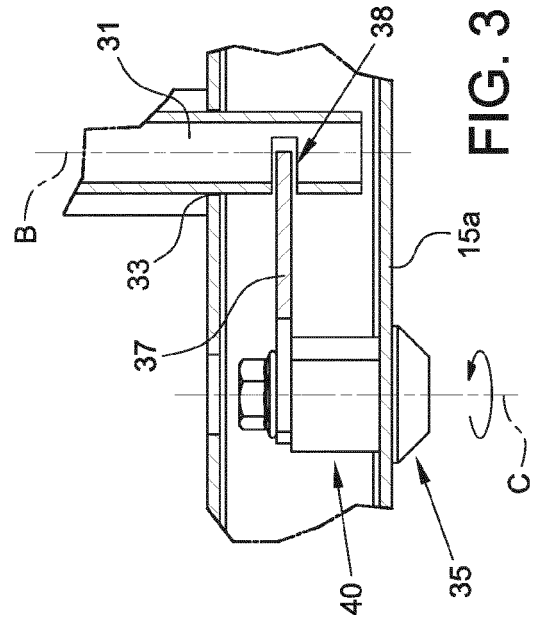


FIG. 3

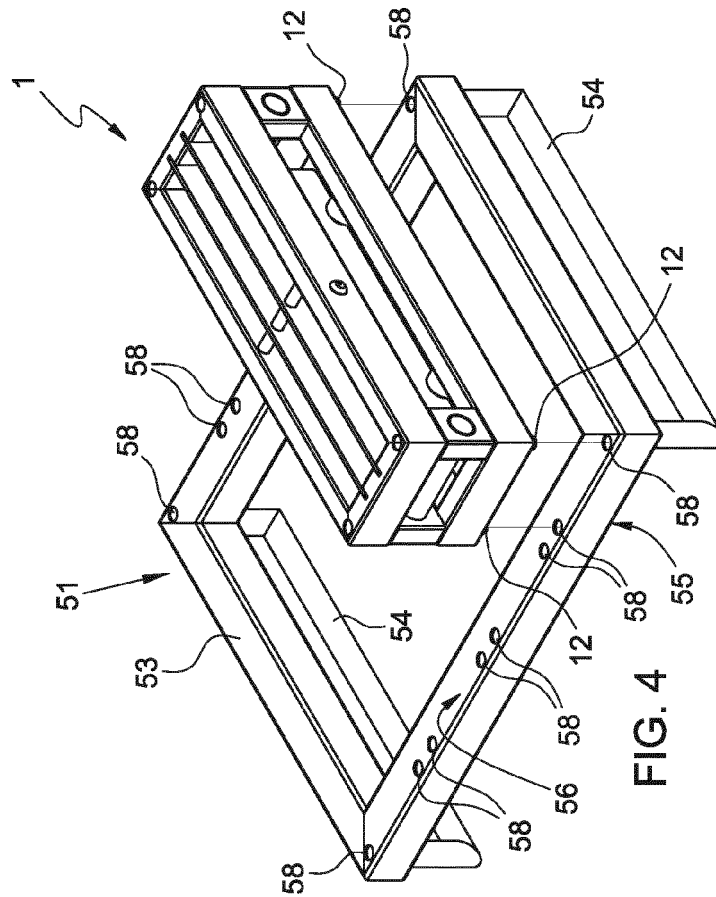


FIG. 4

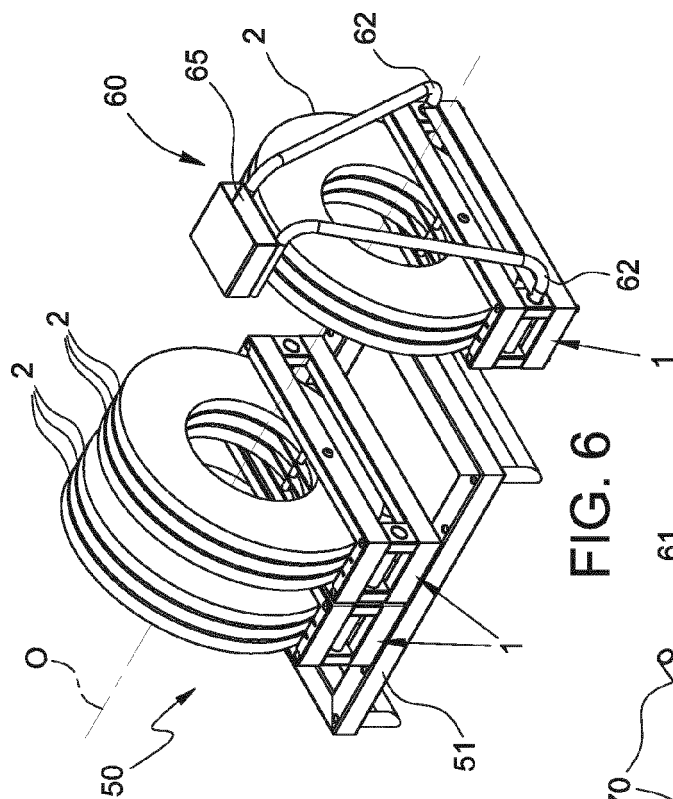


FIG. 6

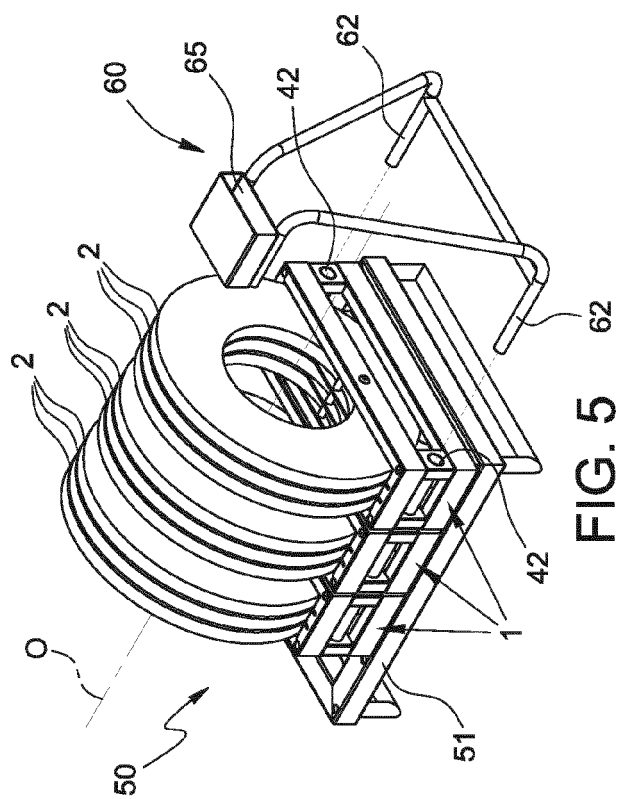


FIG. 5

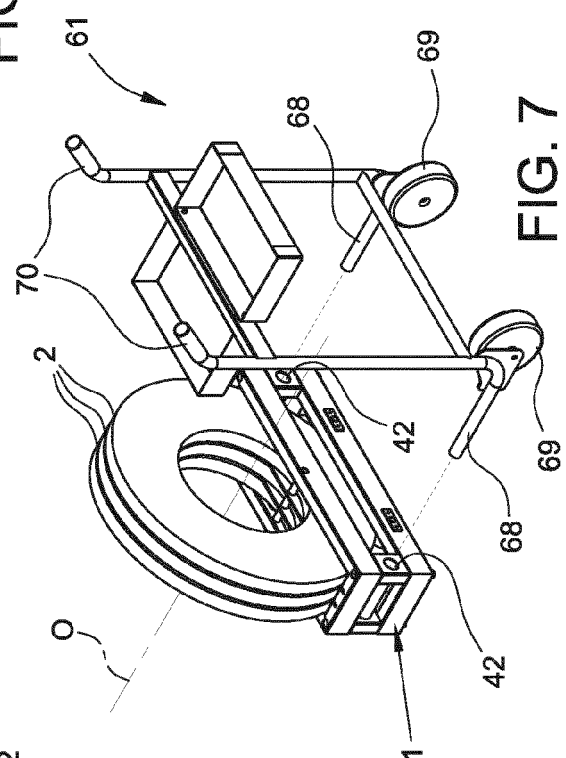


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 18 17 1920

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
Munich		27 August 2018	Ngo Si Xuyen, G
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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