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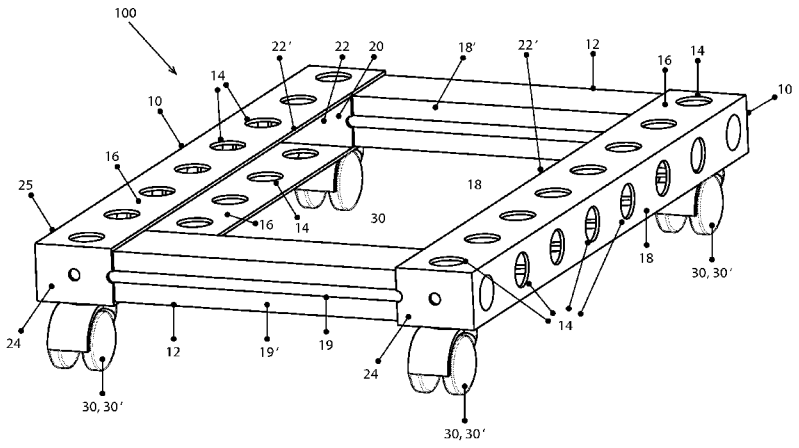
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(54) Title: SELF-CONTAINED DOLLY ASSEMBLY

Fig. 1



(57) Abstract: A dolly assembly including a plurality of hollow interior guide members and one or more rail members, cooperatively structured, configured and dimensioned to be selectively disposed in an operative, weight supporting orientation or a self-contained orientation of reduced dimension and configuration, which facilitates storage. The operative orientation comprises the one or more rail member removably interconnecting the two guide members in spaced relation to one another, wherein a plurality of castors are removably connected to and disposed in movable supporting relation with the interconnected guide and rail members, when in the operative orientation. The self-contained orientation comprises the guide members detached from the operative orientation and the guide members removably connected in confronting, predetermined facing relation to one another, such that the rail members and castors are enclosed within one or both of the hollow interiors of the confronting guide members.

Description
SELF-CONTAINED DOLLY ASSEMBLY

BACKGROUND OF THE INVENTION

Claim of Priority

The present application is based on and a claim of priority is made to a U.S. Nonprovisional patent application having Serial No. 13/755,494, filed on January 31, 2013, which in turn, is related to a provisional patent application that was filed in the U.S. Patent and Trademark Office, namely, that having Serial No. 61/674,430 and a filing date of July 23, 2012, and both of which are incorporated herein by reference in their entirety.

Field of the Invention

The present invention is directed to a dolly or movable platform for carrying loads. The dolly assembly of the present invention comprises a relatively small number of components which are cooperatively dimensioned and structured to be selectively disposed in either an operative, weight supporting orientation or a self-contained orientation. In the operative orientation, one or more rail members are removably interconnected with a plurality of at least two guide members in spaced relation to one another, and a plurality of castors are connected thereto and movably support the dolly. In the self-contained orientation, the aforesaid components are detached and the rail members are disposed within the guide members, wherein the hollow interiors of the guide members are in facing, direct communicating relation, with one another.

Description of the Related Art

The use of dolly structures is quite common for different applications and across a variety of different industries. As such, dolly structures can be generally categorized as platform dollies, hand trucks, mobile carts, etc. In each instance, these different types of dollies are intended for use in movably

supporting different types of objects over various surfaces, and further, the objects being movably supported may vary in weight, size, configuration, etc. Therefore, the selection of a particular type of dolly will usually depend on the physical characteristics of the object with which the dolly is intended to be used.

By way of example, platform dollies usually have a relatively large platform supported by a plurality of wheels, rollers, castors, etc., which are fixedly secured to the under portion of the platform. In contrast, hand trucks normally comprise an elongated, vertically extending, upper portion attached to a lower portion having an outwardly extending supporting platform. As with platform dollies, the hand truck usually includes fixedly or permanently attached wheels connected generally at the junction of the upper and lower portions. Somewhat similarly, movable carts for supporting one or more objects of different weights may also be considered a dolly structure. Weight supporting carts normally include a supporting base and a retaining structure associated therewith in a manner which facilitates the movable support of one or more different objects. Similar to the other dollies noted herein, these cart types of dollies also normally include a plurality of wheels, rollers, castors, etc. which are fixedly attached to the cart.

Importantly, however, each of the above noted types of dolly structures is typically fixed in their configuration and not structured to be reduced in size, such as by being collapsed or at least partially disposed into a folded, reduced size configuration, which would facilitate storage, transportation and overall handling thereof, when the dolly structure is not being used.

Therefore, problems and disadvantages associated with known or conventional dolly structures typically include their inability to be disposed into a collapsed or reduced size orientation when not in use. Further, it is generally acknowledged that prior art dolly structures may be configured to movably support a variety of different articles. However, a prominent consideration in the

design and structuring of conventional dollies is the weight, size and shape of the devices being supported. In turn such considerations will most probably affect the size, configuration of an overall weight bearing abilities of the dolly being used. By way of example, large platform dollies are generally intended to accommodate large and/or relatively heavy devices which may also have a bulking shape or configuration. Accordingly, dollies of this type are not easily collapsed or reduced in size to facilitate the aforementioned storage or transport when not in use.

In turn, lighter weight or smaller dolly structures including, but not limited to, cart type dollies and hand trucks may be structured to movably support smaller relatively lighter loads than the aforementioned platform dollies. As a result these type of dollies may include at least some adjustable features or components in order to facilitate the handling thereof. However, such adjustable features may be only minimally operative to significantly reduce the size and configuration thereof. As a result, dollies of this type are not normally structured to be disposed in a sufficiently collapsed orientation, of sufficiently reduced size and configuration, to permit their efficient and effective storage, transport, etc., either individually or collectively.

Therefore, there is a need in the area associated with the design and manufacture of dollies for a dolly assembly structured to be easily, quickly and reliably disposed between an operative, weight supporting orientation into a self-contained orientation, which facilitates storage, transportation and handling when not in use. Such a proposed and improved dolly assembly will have cooperatively dimensioned and structured components which can be easily and quickly assembled the operative orientation for the movable support of objects which may vary in size, weight or configuration. However, when not in use such a proposed and improved dolly assembly could be designed and structured to include some components which serve to enclose and/or retain other components in a manner which facilitates a “self containment” of

dolly assembly, when not in use. Further, when selectively disposed in the self-contained orientation the various components of the dolly structure do not have to be deformed, structurally altered or modified. As a result, the dolly assembly can be quickly, easily reliably disposed in the operative orientation when needed for use.

Finally, the structural and operative features of a preferred dolly structure will be such as to overcome the disadvantages and problems long recognized in the use of conventional or known dolly structures of the type generally described above. As such, the self-contained orientation of the various components of the proposed dolly structure would be such as to assume a more efficient “footprint” comprising a significantly reduced size and configuration. Therefore, when in the self-contained orientation, storage and/or transport of such a proposed dolly assembly could be accomplished in a significantly reduced area or volume. Also, a plurality of the proposed dolly assemblies could be the collectively transported, stored, etc. in a variety of appropriately configured and sized groupings.

Summary of the Invention

The present invention is directed to a dolly assembly selectively disposable in either an operative, weight supporting orientation or a self-contained orientation. More specifically, the dolly assembly includes a plurality of at least two elongated guide members, each having a hollow interior extending along the length thereof. In addition, the dolly assembly further includes at least one, but preferably a plurality, of at least two elongated rail members. The at least two guide members and the one or more rail members are cooperatively structured, dimensioned and configured to assume either the aforementioned, weight supporting orientation or self-contained orientation.

In at least one preferred embodiment, the operative orientation comprises a plurality of two elongated rail members each removably interconnecting the two guide members to one another in a spaced relation. Similarly, the interconnecting rail

members are also disposed in spaced relation to one another so as to define a configuration of the operative orientation, which is effective to support the weight of an object. Moreover, the overall size and configuration of the dolly, when in the operative orientation, may vary so as to movably support a different objects or devices which may differ in size, weight and shape. Such variances in the physical characteristics of one or more embodiments of the dolly assembly may be accomplished by adjusting the sizes and/or relative positions of the guide and rail members. As a result the dolly assembly may assume an operative orientation which is appropriate to accommodate the object to be supported. As set forth in greater detail hereinafter, at least one preferred embodiment comprises the at least some of the guide members being substantially equivalently structured relative to one another and similarly at least some of the rail members being substantially equivalently structured. However, while maintaining such equivalent structuring, the various components of the dolly assembly may be produced and made available in a variety of sizes so as to enhance its use in movably supporting small, medium and large sized devices.

The mobility of the dolly assembly is accomplished by providing a plurality of castors removably connected to an under portion thereof. More specifically, the castors may be removably connected to the dolly at the interconnecting junctions between the aforementioned rail members and guide members and in at least one embodiment facilitate a removable connection there between. In order to more effectively enhance the strength or weight bearing characteristics of the various embodiments of the dolly assembly, the castors may be more specifically defined as “in-line” castors such as ball castors or roller ball type castors. However, the various embodiments of the dolly assembly are effective for their intended operation by using a variety of mobile supports including “off-set” castors, such as wheel or roller castors as explained in greater detail herein after.

As generally indicated herein, conventional or known dolly structures typically include a substantially fixed support

platform having a predetermined size and configuration. Also known dolly structures include a mobile support assembly which is fixedly attached in a predetermined location so as to provide adequate support to the components thereof as well as the object being supported. Therefore, dolly structures of this type are not effectively capable of being reduced in size and/or configuration to facilitate a more efficient storage, transport and/or handling thereof. The structural and operative features of the preferred embodiments of the present invention overcome such disadvantages by cooperatively structuring the various components thereof including, but not limited to, the plurality of guide members, rail members, castors, etc. As indicated above, the cooperatively structured components of the dolly assembly facilitate their removable connection and selected disposition into either the aforementioned operative orientation or the self-contained orientation. Accordingly, one or more advantages of the present invention include a significant reduction in the size and configuration of the dolly assembly when in the self-contained orientation, thereby facilitating the storage, transportation and handling of one or a plurality of such dolly assemblies, when not in use.

In more specific terms, each of the at least two guide members are dimensioned to be sufficiently larger, at least in transverse dimension and possibly also in length, than the rail members. The increased size should be sufficient to retain and at least partially enclose the length of the rail members within and in substantially longitudinal alignment with the hollow interiors of the guide members. Moreover, in at least one embodiment each of the guide members may be sufficiently longer than the rail member(s) to retain and enclose one or more of the plurality of castors, once detached from the operative orientation, concurrently with at least one of the rail members, within the hollow interior(s) thereof. In yet another embodiment, each or at least one of the guide members may have a length substantially equal to or appropriately greater than a corresponding rail member of the dolly assembly. In this embodiment, the one or more guide

members have a length sufficient to retain at least one rail member. Accordingly, the self-contained orientation of this embodiment is structured to position one or more castors within a hollow interior of one or more rail members, wherein the rail member(s) are then disposed within the hollow interior of one or more guide members. Therefore, in one or more embodiments of the present invention, the self-contained orientation comprises all of the components, including the rail members, castors, et., being completely or at least partially enclosed within the guide members, in the manner described in greater detail hereinafter.

In addition, the elongated hollow interior of each guide member preferably, but not necessarily, extends along the entire length thereof. Further, each of the guide members includes an open longitudinal side extending along the entire or at least a sufficient length of the hollow interior to allow passage there through of a rail member and possibly a castor. Therefore, at least one preferred embodiment of the dolly assembly comprises the self-contained orientation including each of the guide members having at least one rail member retained and at least partially enclosed within its hollow interior, concurrently with or independently of the retaining of at least some of the plurality of castors therein.

Due to the existence of an open longitudinal side in each of the guide members, the self-contained orientation may be further defined by a removable connection of the guide members in facing, confronting relation to one another. When so connected, the open longitudinal and hollow interiors thereof are disposed in direct facing, communicating relation with one another. Therefore, when in the self-contained orientation, the plurality of rail member and the plurality of castors will be enclosed, preferably in their entirety, within the hollow interiors of the removably connected and confronting guide members. As a result, the dolly assembly will have a significantly reduced “footprint” or size and configuration which significantly enhance its ability to be efficiently stored and/or transported in storage areas or

transportation facilities having a reduced size and configuration. Further, efficiency in storage and/or transportation can be further enhanced by concurrently stacking, grouping or otherwise arranging a plurality of such dolly assemblies, each of which are in the self-contained orientation.

It should be noted that one or more preferred embodiments of the dolly assembly of the present invention will be primarily described utilizing a plurality of at least two guide members and a plurality of at least two rail members. However, the structural versatility and operational effectiveness of yet another embodiment of the dolly assembly can be demonstrated by the use of a single rail member disposed in removably, interconnecting relation to two spaced guide members. In such a structural variation, the at least one rail member may be removably interconnected in transverse relation to the spaced guide members to define the operative orientation. When disposed in an operative, weight supporting orientation, an appropriate number of castors may be strategically placed about the under portion of the dolly assembly, such that it is reliably stable and the various components thereof are fixedly but removably interconnected.

It is further emphasized that at least one embodiment of the present invention comprises at least some of the same components of the dolly assembly being equally dimensioned and configured. More specifically, each of the two or more guide members may be structured to be substantially equally dimensioned and configured with one another. Similarly, each of the two or more rail members may be structured to be equally dimensioned and configured with one another. This feature will have the benefit of facilitating the design and/or manufacture of the dolly assembly by requiring the structuring of the guide members and/or the rail members to be substantially identical. As a result, the manufacture of a plurality of guide members having different sizes and shapes and/or a plurality of rail members having different sizes and/or shapes will not be necessary.

These and other objects, features and advantages of the present invention will become clearer when the drawings as well as the detailed description are taken into consideration.

Brief Description of the Drawings

For a fuller understanding of the nature of the present invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

Figure 1 is a perspective view of one preferred embodiment of the dolly assembly in an operative, weight supporting orientation.

Figure 2 is a detailed view of one of a plurality of castors which may be removably connected to and movably support the dolly when in the operative orientation of Figure 1.

Figure 2A is another embodiment of one of a plurality of castors which may be connected to and movably support the dolly when in the operative position of Figure 1.

Figure 3 is a bottom view and partial cutaway of an intersecting junction of components of the embodiment of Figure 1 and a location where one of a plurality of castors is removably connected thereto.

Figure 4 is a perspective view of the embodiment of Figure 1 in a self-contained orientation.

Figure 5 is a perspective interior view in partial cutaway of the embodiment of Figure 4.

Figure 6 is a perspective view of yet another embodiment of the dolly assembly of the present invention in an operative orientation.

Figure 7 is a top plan view of the embodiment of Figure 6.

Figure 8 is a side view of the embodiment of Figure 7 in an operative position.

Figure 9 is a front view in partial cutaway of the embodiment of Figures 7 and 8 in an operative orientation.

Figure 9A is a detailed view in partial cutaway of an indicated portion of Figure 9.

Figure 10 is an exploded view representing the various components of the embodiments of Figure 7 through 9 in an

unassembled form.

Figure 11 is a perspective view of the embodiment of Figures 6-10 in a self-contained orientation.

Figure 12 is an exploded view of the embodiment of Figure 11 in an unassembled form.

Figure 13 is a front view of the embodiment of Figures 11 in assembled form.

Figure 14 is a sectional view of the embodiment of Figure 13 along line 14-14.

Like reference numerals refer to like parts throughout the several views of the drawings.

Detailed Description of the Preferred Embodiment

As represented in the accompanying drawings, the present invention comprises at least one preferred embodiment of a dolly assembly generally indicated as 100. The dolly assembly 100 is structured to be selectively disposed into an operative, weight supporting orientation, as represented in Figure 1, or a self-contained orientation, as represented in Figures 4 and 5. As explained in greater detail hereinafter, the self-contained orientation of the dolly assembly 100 has a significantly reduced size and overall configuration, thereby facilitating storage and/or transport of one or a plurality of the dolly assemblies, when not in use.

With primary reference to Figure 1, the dolly assembly 100 includes a plurality of at least two guide members 10 and at least one, but in many practical applications, a plurality of at least two rail members 12. The material from which the rail and guide members 10 and 12 are formed may include metal, plastic, composite and a variety of other materials or a combination thereof. However, the material utilized should include sufficient strength, rigidity and weight bearing characteristics to allow the dolly assembly 100 to support objects which may differ in size, weight, shape, etc., when the dolly assembly 100 is in the operative weight supporting orientation. In at least one embodiment, numerous structural modifications may be made in the guide members

10 and/or rail members 12 such as, but not limited to, a plurality of apertures 14 formed in and extending along the upper and lower side segments 16 as well as the outer side segment 18 of the guide members 10. The size, number and location of the plurality of apertures 14 may vary depending upon the overall size and configuration of each of the guide members 10. At least one purpose of the formation of the plurality of apertures 14 is to lessen the weight thereof while maintaining the strength and structural integrity of the guide and/or rail members 10 and 12, respectively which include the aforementioned apertures 14. Moreover one or more additional embodiments of the present invention includes the openings 14 being disposed and structured to facilitate the disposition of the various components in the self-contained orientation.

Other structural modifications which may be included in at least the rail members 12 comprise a stamped, corrugated or other integrally formed seam or crease 19 which may be provided in interior and exterior sides 19' of each of the one or more rail members 12. The integration of such structure serves to enhance the strength and/or rigidity integrity thereof. It is emphasized that the aforementioned modifications including the apertures 14, integrated seam 19, etc. may be absent from the guide members 10 and the rail members 12 without detracting from the performance characteristics of the dolly assembly 100.

As also represented in Figures 1 and 5, each of the guide members 10 include a hollow interior 20 extending along at least a majority and preferably along the entirety of the length thereof. As such, the hollow interior 20 of each of the guide members 10 is accessible and disposed in direct communication with an open longitudinal side 22, which also extends along at least a majority, but preferably the entirety, of the length of each of the guide members 10. Also, closed ends 24 may or may not be included at opposite ends of each of the guide members in at least partially closing relation to the ends of the respective hollow interiors 20 of each of the guide members 10. When present, the closed ends 24 facilitate intended retaining features of the dolly

assembly 100 when in the self-contained orientation of Figures 4 and 5.

Mobility of the dolly assembly 100, when in the operative orientation is facilitated by a movable support assembly preferably comprising a plurality of castors as at 30 and/or 30'. The number and location of the plurality of castors 30 or 30' removably connected to the dolly assembly may vary depending upon the overall size and configuration thereof. More specifically, at least one preferred embodiment of the dolly assembly 100 includes a plurality of two guide members 10 being disposed in spaced, interconnecting relation by a plurality of two rail members 12. However, as indicated the overall shape and size of the dolly assembly 100 may vary so as to accommodate the movable support of a variety of objects or devices, which may differ in size, weight, configuration, etc.

Moreover and with specific reference to Figures 2 and 2A, the castors 30 may include off-set castor construction including a link or stem 32 having its longitudinal axis 32' at least partially offset from the center or diameter 34' of the wheel or roller 34. In contrast, at least one preferred embodiment the dolly assembly 100 is movably supported by a plurality of an in-line castors 30' such as a ball castor, as represented in Figure 2A. As schematically represented, the movable or rolling support in the embodiment of 2A comprises an in-line castor comprising a ball type roller 36 connected to a mounting stem or link 38 in an in-line orientation. As used herein, the term "in-line" when referring to the ball castor 30' of Figure 2A is meant to describe the longitudinal axis 32' of the connecting stem or link 38 being disposed coincident with the center and/or diameter 36' of the ball 36. One advantage of the in-line castor construction 30' of the embodiment of Figure 2A is an added strength and/or improved operation, in that longitudinal and/or diametric axis 36' and 38' are inline with one another. As a result, any weight supported by the ball or inline castor 30' will pass through the center of the castor 30'. In contrast, the off-set castor construction 30 of the embodiment of Figure 2 differs in that any

weight supported thereby will not pass through the center of the wheel or roller 34 as indicated, but be vectored at least partially along both axis 32' and 34'.

With regard to Figure 3, removable interconnection of the castor 30 or 30' to the dolly assembly 100, when in its operative orientation of Figure 1, may be accomplished by mounting apertures or like structures 40 formed in the opposite ends or other appropriate location of the rail members 12. The mounting structures 40 are dimensioned and configured to receive and removably retain the connecting link 32 or 38 of the respective castors 30 and 30'. As such, the mounting aperture or structure 40 is disposed in aligned relation with a correspondingly disposed opening 14 in the lower or under side 16 of the guide members 10. It is again emphasized that in order to easily dispose the dolly assembly 100 in the self-contained orientation of Figures 4 and 5, the castors 30 or 30' are removably connected by insertion of the respective connecting links 32 and 38 through the corresponding aperture 14, into removable connecting relation with the mounting structures 40, formed in corresponding ends of each of the rail members 12.

An easy and effective positioning of the dolly assembly 100 between the operative orientation and the self-contained orientation is at least partially due to the cooperative structuring of the guide members 10 rail members 12 and castor members 30, 30'. More specifically, when in the operative orientation of Figure 1, corresponding opposite ends of each of the one or more rail members 12 are disposed within the hollow interior 20 of corresponding ends or other portions of the guide members 10. Removable connection between the guide members 10 and rail members 12 may be at least partially accomplished by the insertion of the connecting links 32 and 38 of the corresponding castor structures 30 and 30' into the intersecting junctions 25, such as at the correspondingly disposed opposite ends of each of the guide and rail members 10 and 12 respectively. Moreover, the transverse dimension of the interconnecting rail members 12 and the transverse dimension of the hollow interior 20 of the guide

members 10 may be such as to at least generally define a "frictional fit", which further facilitates the removable interconnection of the rail members 12 to the guide members 10 as represented in Figure 1.

Further, when in the stored, self-contained orientation of Figures 4 and 5, each of the one or more rail members 12 are disposed within the interior of a corresponding guide member 10. Accordingly, the longitudinal dimension of each of the guide members 10 is sufficient to include and enclose the entire length of at least one rail member 12 as clearly represented in Figure 5. Further, the stored and self-contained orientation of the dolly assembly 100 may also comprise at least one or a plurality of the castors 30, 30' being disposed within the hollow interior 20 of one or both of the guide members 10 concurrently to at least one of the rail members being disposed therein. Therefore, the transverse dimension of elongated, the open longitudinal side 22 of each of the one or more guide members 10 sufficient to facilitate passage there through of at least one rail member 12 as well as one or more castors 30, 30'. When so positioned, the stored, self-contained orientation may be further defined by the open longitudinal side 22 of each of the at least two guide members 10 being disposed in direct facing relation to one another such that the hollow interiors 20 thereof are also in direct communication and in enclosing relation to the self-contained rail members 12 and/or castors 30, 30'.

Due to the inclusion of an open longitudinal side 22 in each of the guide members 10, the self-contained orientation of Figures 4 and 5 may be further defined by a removable connection of the guide members 10 in facing, confronting relation to one another. When so connected, the open longitudinal sides 22 and the hollow interiors 20 of the guide members 10 are disposed in direct confronting and/or facing, communicating relation with one another. Such confronting relation of the guide members 10 may be more specifically described as the outer peripheral edges 22', of each of the open longitudinal sides 22 of each guide member 10, being disposed in a aligned, confronting and/or engaging relation

with one another along at least a predetermined or majority of their respective lengths, as represented in Figures 4 and 5. Therefore, when in the self-contained orientation, the plurality of rail member 12 and the plurality of castors 30 or 30' will be enclosed, preferably in their entirety, within the hollow interiors 20 of the removably connected and confronting guide members 10. As a result, the dolly assembly 100 will have a significantly reduced "footprint" or size and configuration which significantly enhance its ability to be efficiently stored and/or transported in storage areas or transportation facilities having a reduced size and configuration. Further, efficiency in storage and/or transportation can be further enhanced by concurrently stacking, grouping or otherwise arranging a plurality of such dolly assemblies 100, when each is in the self-contained orientation.

Interconnection of the two guide members 10 in the stored, self-contained orientation of Figures 4 and 5 may be accomplished by including a variety of different connecting structures or devices. More specifically, various types of magnetic, mechanical and/or strap-like connectors may be applied to the exterior of the confronting guide members 10 so as to maintain the open longitudinal sides 22 in facing relating to one another while in the self-contained orientation. However, the mechanical, magnetic or other type of connecting facilities utilized to maintain the facing, hollow interior communicating relation of the guide members 10 in the configuration represented in Figures 4 and 5 is such as to also render their separation and assembly into the operative orientation of Figure 1 relatively easy and in a short amount of time.

As clearly indicated, the operative orientation may be represented by the embodiment of Figure 1, wherein the plurality of at least two guide members 10 are interconnected in spaced relation to one another by a plurality of at least two spaced apart rail members 12. When assembled in this manner represented, the guide members 10 and rail members 12 collectively define a substantially continuous closed peripheral configuration of the

dolly assembly 100, wherein the center thereof may be substantially open. As indicated above, the number of rail members 12 may vary such as when the length of the guide members 10 are significantly increased for the purpose of movably supporting a larger, heavier or unusually configured object or device.

In contrast, the operative orientation may also comprise a plurality of guide members 10 disposed in interconnected, spaced apart relation by a single rail member 12 (not shown for purposes of clarity). When at least one rail member 12 is utilized to interconnect the guide members 10, it may be connected intermediate the opposite ends of the spaced apart guide members 10 so as to form a generally “I” or “H’ configuration. In such an operative orientation, the plurality of castor 30 or 30’ may still be disposed at opposite ends of the guide members 10 in order to provide meaningful stability and balance to the dolly assembly 100 when in this modified operative orientation. Therefore, the preferred embodiment of the dolly assembly 100 may vary in size and/or configuration by varying the length of the guide members 10 as well as the length and number of the rail members 12 as indicated.

Therefore, in at least one preferred embodiment, the dimension and structure of the guide members 10 are sufficient to enclose the rail members 12 being utilized, as well as the plurality of castors 30 or 30’ needed to support the dolly assembly 100 in the aforementioned stable manner. As described above and represented in the accompanying Figures, the dimension and configuration of each of the one or more guide members 10 will differ from each of the one or more rail members 12. However, it is further emphasized that at least one embodiment of the present invention comprises at least some of the same or corresponding components of the dolly assembly being equally dimensioned and configured. More specifically, each of the two or more guide members 10 may be structured to be substantially equally dimensioned and configured with one another. Similarly, each of the two or more rail members 12 may be structured to be equally

dimensioned and configured with one another. This feature will have the benefit of facilitating the design and/or manufacture of at least one embodiment of the dolly assembly 100 by structuring of the guide members 10 to be substantially identical and/or the structuring of the rail members 12 to be substantially identical. As a result, the manufacture of a plurality of guide members having different sizes and shapes and/or a plurality of rail members having different sizes and/or shapes will not be necessary.

Yet another preferred embodiment of the dolly assembly of the present invention is represented in Figures 6 through 14 and generally indicated as 100'. The dolly assembly 100' includes substantially similar or equivalent structural features and components as that of the embodiment of Figure 100, as represented in Figures 1 through 5. More specifically, the dolly assembly 100' is selectively disposable into an operative, weight bearing orientation represented in Figures 6-9A or in the substantially collapsed or self-contained orientation of Figure 11, 13 and 14. Also, when in the operative position, at least two guide members 10 are interconnected in spaced relation to one another by at least one, but preferably a plurality of two rail members 12. As also represented, the rail members 12 may include apertures or openings 14 dimensioned and configured to receive passage of a castor 130 at least partially there through so as to facilitate placement of the dolly assembly 100' in the self-contained orientation, as represented in greater detail in Figures 12 and 14.

Also, at least one but preferably each of the plurality of guide members 10 includes an open longitudinal side 22 having a sufficient transverse dimension to facilitate passage there through of at least one of the rail members 12, as represented in the exploded view of Figure 12. When so positioned, the rail member 12 is disposed within the hollow interior of the guide member 10 in substantially longitudinally aligned relation to the length of the guide member 10 and the hollow interior 22. Further, the self-contained orientation of the dolly assembly 100', as

represented in Figures 11 through 14, similarly comprises the open longitudinal sides 22 disposed in substantially confronting and/or facing relation with one another, such that their peripheral portions or edges 22' may be aligned, engaged and/or confront one another.

As with the embodiment of Figures 1 through 5, the self contained orientation of Figure 7 may be maintained utilizing any of a plurality of different connectors or connecting structures, such as surrounding cords, straps, wrappings and/or mating or engaging magnetic or mechanical connectors. However, as more clearly represented in Figures 12 and 14, one additional preferred embodiment of the present invention includes the use of at least one but preferably a plurality of two or more connector members 50. As set forth in greater detail hereinafter, each of the connectors has an elongated shaft 52 and an enlarged or expanded head portion 54 connected to one end of the shaft 52. In addition, at least a portion of the length of each of the shafts 52 has an externally threaded or other equivalent structure 52' which facilitates its removable connection with at least one of the castor structures 130 as represented in detail in Figures 9 and 9A. More specifically, while the entire length of the shaft 52 may be externally threaded or otherwise structured and configured to include some type of connecting structure, at least a designated portion of the length, preferably adjacent to the free end 56 is externally threaded or otherwise structured to include the connecting facility 52'.

The versatility of the embodiment of Figure 6 through 14 is further demonstrated by the multiple functions of the connector members 50. Moreover, each of the connector members 50 is structured to interconnect correspondingly disposed opposite ends 10' and 12' at one of the connected junctions 25, when the dolly assembly 100' is in the operative orientation of Figures 6 through 9A. Further, each of the opposite ends 10' and 12' respectively include apertures or holes 110 and 112. The intended positioning of the opposite ends 10'and 12' of the guide and rail members 10 and 12, when assuming the operative orientation, serves to axially

align the apertures 110 and 112 in the correspondingly disposed opposite ends 10’ and 12’ to form the connecting junctions 25. In order to maintain this interconnection, the shaft 52 of a different one of the plurality of connectors 50 is inserted through the axially aligned apertures or openings 110, 112 in the opposite ends 10’ and 12’ forming each of the connected junctions 25.

Moreover, due to the provision of an external thread or other connecting configurations 52’ and the predetermined length of the shaft 52, the free end of each of the shafts 52 may be removably connected, with a correspondingly positioned castor 130. In accomplishing such removable connection, a mounting structure, such as an internally threaded socket 40’ will receive and be removably threaded onto the connecting portion 52’ of each of the connector members 50. As should be apparent the length of each of the shafts 52 is such as to have the connecting portions 52’ thereof pass at least minimally out of the corresponding interconnected junction 25 and into the removable and/or threaded engagement with the castors 130. Also, in the embodiment of Figures 6 through 14, each of the castors 130 are preferably structured to define “in-line” castors such as a ball type castor, including a roller ball 131, similar to, but distinguishable from, the castor 30’ as represented in Figure 2A.

In order to maintain the interconnected relation of each of the connector members 50 relative to the junctions 25, the enlarged head portion 54 thereof rests on the outer surface or portion of corresponding ones of the guide members 10 as clearly represented in Figures 6-10. Therefore, the enlarged head portions 54 of each of the connector members 50 will be exposed on an outer or upper portion of the dolly assembly 100’ when in its operative orientation. Concurrently, the correspondingly disposed and removably connected castors 130 will be connected to and disposed on the under portion of the dolly assembly 100’. Further, the size, shape and/or material from which each of the enlarged head portions 54 are formed may also facilitate their use as friction and/or cushioning pads, which are disposed to engage

the one or more objects disposed on the upper or outer surface of the dolly assembly 100' when such an object(s) is being movably supported.

As set forth above, the plurality of connector members 50 have a multiple function in that they collectively serve to maintain the stability of the connected junctions 25 while removably attaching the plurality of castors 130 in movably supporting relation to the dolly assembly 100'. In addition, and with specific reference to Figures 12 through 14, the connector members 50 may be removed from their interconnecting relation with the junctions 25 when it is intended to disassemble the dolly assembly 100' and arrange it in the self contained orientation of Figure 11. More specifically, each of the guide members 10 include retaining apertures 210 formed on and extending through one side thereof. In cooperation therewith, each of the rail members 12 includes retaining apertures 212 formed on each of two opposite sides. Once the rail members 12 are disposed within the hollow interior 20 of corresponding ones of the guide members 10, the retaining apertures 210 and 212 are disposed in aligned relation to one another as clearly and schematically represented in Figure 12. In such an aligned orientation and as clearly represented in Figure 14, at least one but preferably and more practically a plurality of at least two connectors 50 are inserted from the exterior of opposite ones of the guide members 10 through the retaining apertures 210 and further through the retaining apertures 212 of the corresponding rail members 12. The length of each of the shafts 52 is sufficient to extend completely through correspondingly disposed guide members 10 and rail members 12, such that the outer or distal free end 56 penetrates into the oppositely disposed rail member 12. Once so disposed, the free end 56 of each of the connectors 50 is threadedly or otherwise connected to a correspondingly disposed and aligned retaining aperture 112 of an opposite rail member 12 penetrated by the free end 56. Moreover, due to the enlarged head 54 engaging the outer portion or surface of the confronting guide members 10 along with the distal ends 56 being threadedly or otherwise attached to the

retaining aperture 212 in the oppositely disposed rail member 12, as represented in Figure 14, the dolly assembly 100' will be removably maintained in the self contained orientation. It should be further noted that at least two of the connectors, such as at 50' and 50" in Figure 14, are "reversely oriented" in order to initially enter through different ones of the confronting guide members 10. Such a reverse orientation, along with the enlarged head 54 engaging the outer portions of the guide members, which they initially enter, will assure a firm but removable attachment of the guide and rail members 10 and 13 respectively in the collapsed orientation of Figures 11 and 14. Moreover, the confronting guide and rail members 10 and 12 can be accurately described as being "sandwiched" between the enlarged heads 54 of the reversely oriented connectors 50' and 50".

Further with regard to Figures 12 and 14, the storage of the castors 130 into the interior of the rail members 12 is accomplished by cooperative dimensioning of the openings 14 and each of the castors 130. Therefore, once the castors 130 are disconnected from the dolly assembly 100', when in its operative position, they are passed into the interior of one of the rail members 12, through the openings 14 as schematically represented in Figure 12. The stored position of the castors 130 is represented in Figure 14 once they have passed through the openings 14 into the interior of one of the rail members 12 and when the rail members 12 are disposed within the hollow interior of the guide members 10.

Further with regard to the self-contained orientation of the dolly assembly 100, as represented in Figures 4 and 5, the overall "footprint" is sufficiently reduced in size and configuration to enable a single dolly assembly 100 or a plurality of dolly assemblies 100 to be efficiently stored and/or transported in a smaller area or facility. In addition, when a plurality of the dolly assemblies are concurrently stored, or transported, the reduced size and configuration of each dolly assembly as represented in Figures 4 and 5, may facilitate there being arranged in a stacked array or other appropriately configured

grouping, best suited for storage, transportation, handling, etc.

Since many modifications, variations and changes in detail can be made to the described preferred embodiment of the invention, it is intended that all matters in the foregoing description and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents.

Now that the invention has been described,

Claims

1. A dolly assembly structured to be disposable between operative and self-contained positions, said dolly assembly comprising:

a plurality of at least two elongated guide members each having a hollow interior extending along the length thereof,

at least one elongated rail member,

said two guide members and said one rail member cooperatively structured to be disposed in either an operative orientation or a self-contained orientation,

said operative orientation comprising said one rail member removably interconnecting said two guide members in spaced relation to one another, and

said self-contained orientation comprising said one rail member disposed within said hollow interior of at least one of said two guide members.

2. A dolly assembly as recited in claim 1 further comprising a plurality of castors removably connected to at least said two guide members in movably supporting relation to said two guide members and said one rail member when in said operative orientation.

3. A dolly assembly as recited in claim 2 wherein said self-contained orientation further comprises at least some of said plurality of castors removably disposed within said hollow interior of at least one of said two guide members.

4. A dolly assembly as recited in claim 1 wherein said self-contained orientation further comprises said one rail member disposed in substantially longitudinal alignment within at least a majority of a length of said hollow interior of at least one of said two guide members.

5. A dolly assembly as recited in claim 1 wherein at least one of said two guide members includes an open longitudinal side extending along at least a majority of the length thereof; said open side having a transverse dimension sufficiently larger than a transverse dimension of said one rail member to facilitate passage of said one rail member through said open side into substantially

longitudinal alignment with said hollow interior of said one guide member.

6. A dolly assembly as recited in claim 5 wherein each of said two guide members include an open longitudinal side extending along at least a majority of the length thereof; said self-contained orientation further comprising said open sides of said two guide members connected in facing, confronting relation to one another and said hollow interiors thereof disposed in directly communicating relation with one another and in enclosing relation to said one rail member.

7. A dolly assembly structured to be disposed between operative and self-contained positions, said dolly assembly comprising:

a plurality of at least two elongated guide members each having a hollow interior extending along at least a portion of the length thereof,

a plurality of at least two elongated rail members each removably interconnecting said two guide members in spaced relation to one another to define an operative, weight supporting orientation,

a plurality of castors connected in movable supporting relation to said interconnected guide and rail members at least when in said operative orientation, and

said two guide members dimensioned and structured to enclose at least said two rail member therein to define a self-contained orientation.

8. A dolly assembly as recited in claim 7 further comprising said two guide members dimensioned and structured to concurrently and collectively enclose said two rail members within and in substantially longitudinal alignment with said hollow interiors when in said self-contained orientation.

9. A dolly assembly as recited in claim 8 wherein each of said two guide members includes an open longitudinal side; said self-contained orientation further comprising said open longitudinal sides of said two guide members removably connected in facing, confronting relation to one another and said hollow interiors thereof disposed in directly communicating relation, said hollow

interiors thereof collectively enclosing at least said two rail members.

10. A dolly assembly as recited in claim 9 wherein each of said open longitudinal sides comprises a transverse dimension sufficiently large to facilitate passage of at least one of said rail members there through into said hollow interior thereof, in substantially longitudinally aligned relation to the length of a corresponding one of said guide members.

11. A dolly assembly as recited in claim 7 wherein each of said guide members comprises a length sufficient to concurrently receive and enclose an entire length of at least one of said rail members and at least one of said plurality of castors within said hollow interior thereof.

12. A dolly assembly as recited in claim 7 wherein said operative, weight bearing orientation comprises a plurality of connected junctions comprising opposite ends of each of said guide members connected to correspondingly disposed opposite ends of a different one of said rail members.

13. A dolly assembly as recited in claim 12 further comprising at least one connector member having an elongated shaft, said shaft extendable through one of said connected junctions in interconnecting relation to corresponding ones of said opposite ends of said guide member and rail member and in connecting relation to one of said plurality of castors, when in said operative orientation.

14. A dolly assembly as recited in claim 13 wherein said shaft of said one connector member is disposed in interconnecting relation between said two guide members and corresponding ones of said rail members, when in said self-contained orientation.

15. A dolly assembly as recited in claim 7 further including at least two connector members each having an elongated shaft; said self-contained orientation further comprising each of said shafts extending through a different one of said guide members and a corresponding one of said rail members into connected relation with oppositely disposed ones of said rail and guide members.

16. A dolly assembly as recited in claim 15 wherein each of said

connector members includes an enlarged head portion connected to one end of said shaft and disposed in abutting relation to an outer surface of a correspondingly disposed, different one of said guide members.

17. A dolly assembly as recited in claim 7 wherein said self-contained orientation further comprises at least one of said castors disposed within one of said rail members concurrently to said one rail member disposed within said hollow interior of one of said guide members.

18. A dolly assembly structured to be disposed between operative and self-contained positions, said dolly assembly comprising:

a plurality of at least two elongated guide members each having a hollow interior extending along at least a portion of the length thereof and an open longitudinal side extending along the length of said hollow interior in direct communicating relation therewith,

a plurality of at least two elongated rail members each removably interconnecting said two guide members in spaced relation to one another to at least partially define an operative, weight supporting orientation,

a plurality of castors connected in movable supporting relation to said interconnected guide and rail members at least when in said operative orientation,

said two guide members dimensioned and structured to enclose at least said two rail members therein to at least partially define a self-contained orientation,

said self-contained orientation further comprising said open longitudinal sides of said two guide members removably connected in facing, confronting relation to one another and said hollow interiors thereof disposed in directly communicating relation and collectively, in enclosing relation to at least said two rail members, and

each of said open longitudinal sides comprising a transverse dimension sufficiently large to facilitate passage of at least one of said rail members there through into said hollow interior thereof, in substantially longitudinally aligned relation to the

length of a corresponding one of said guide members.

19. A dolly assembly as recited in claim 18 further comprising at least one connector member having an elongated shaft, said shaft extendable through one of said connected junctions in interconnecting relation to corresponding ones of said opposite ends of said guide member and rail member and in connecting relation to one of said plurality of castors, when in said operative orientation.

20. A dolly assembly as recited in claim 19 wherein said connector member includes a head portion connected to one end of said shaft and disposed on an outer portion of said junction, one end of said shaft, opposite to said head portion, connecting said one castor to an under portion of said one junction.

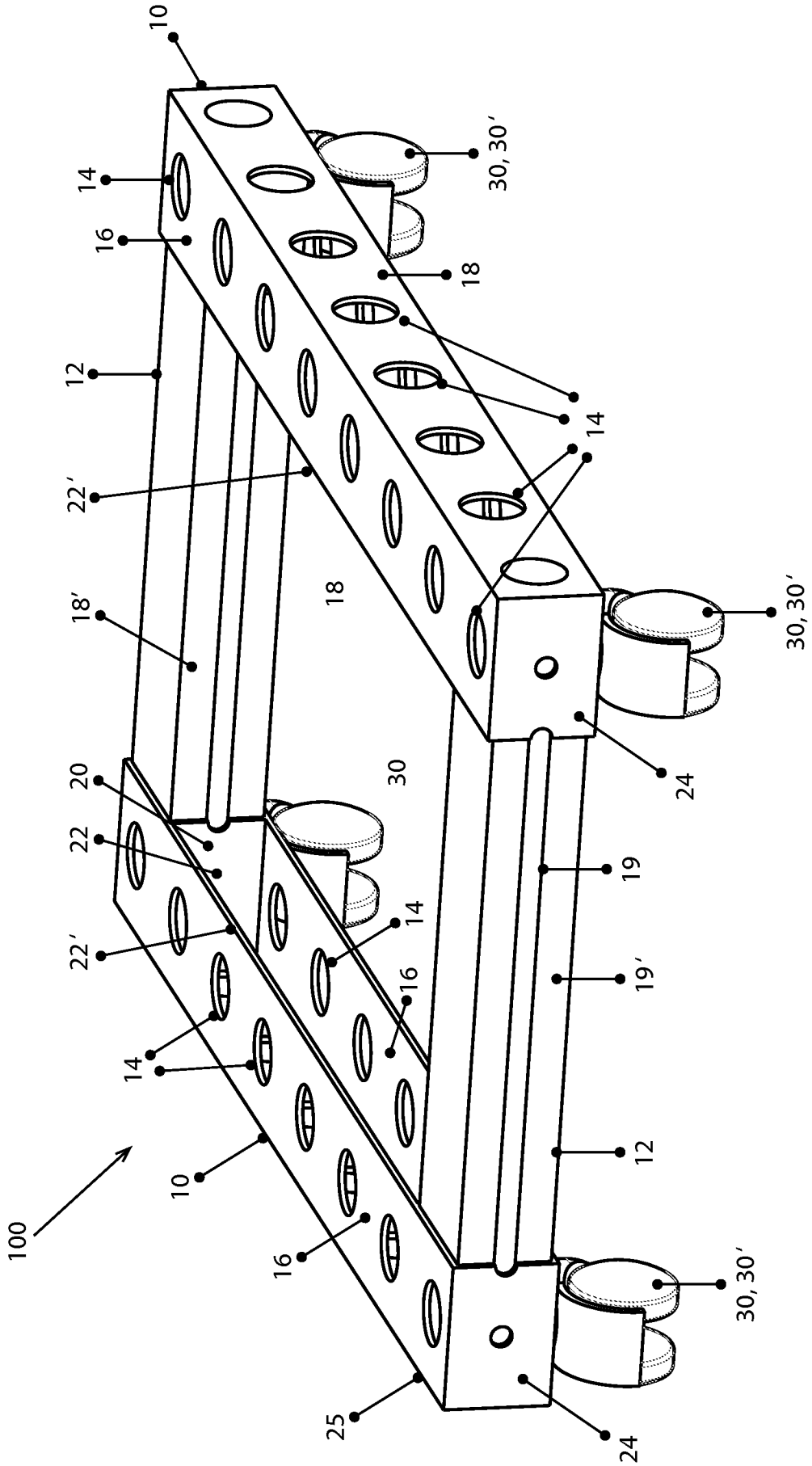

10
14
16
12
22′
18′
20
22
22′
14
10
100
16
25
24
30, 30′
18
18
14
14
30
24
19
19′
12
30, 30′
30, 30′

Fig. 1

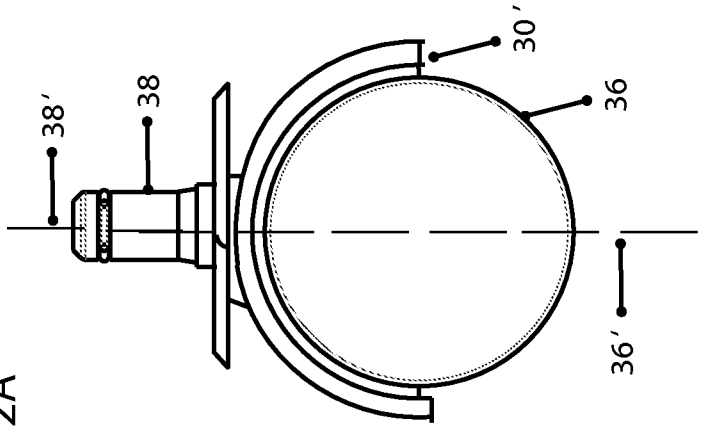


Fig. 2A

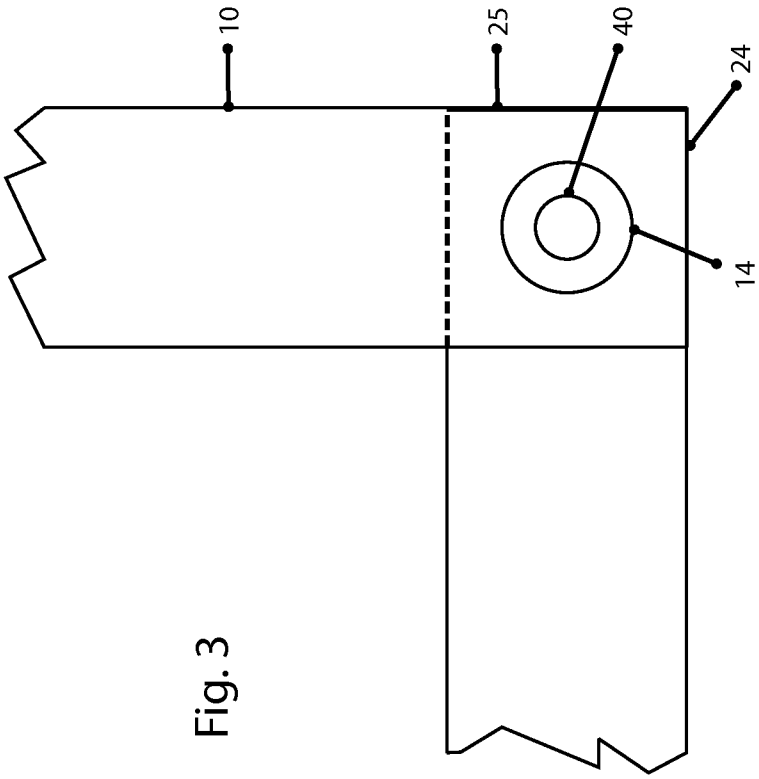


Fig. 3

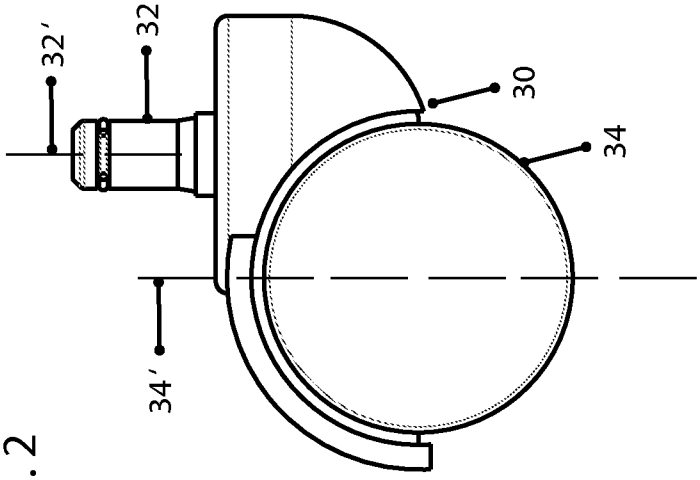


Fig. 2

Fig. 4

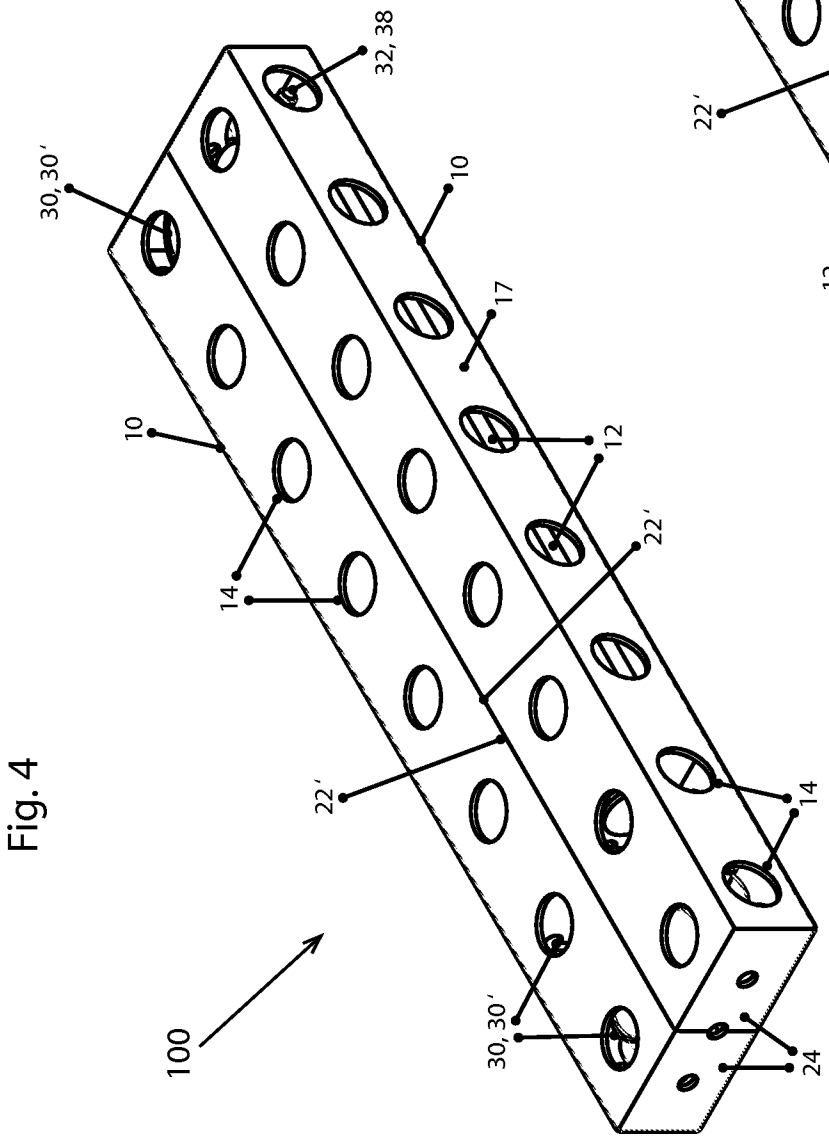

100
30, 30′
10
14
22′
32, 38
17
12
24

Fig. 5

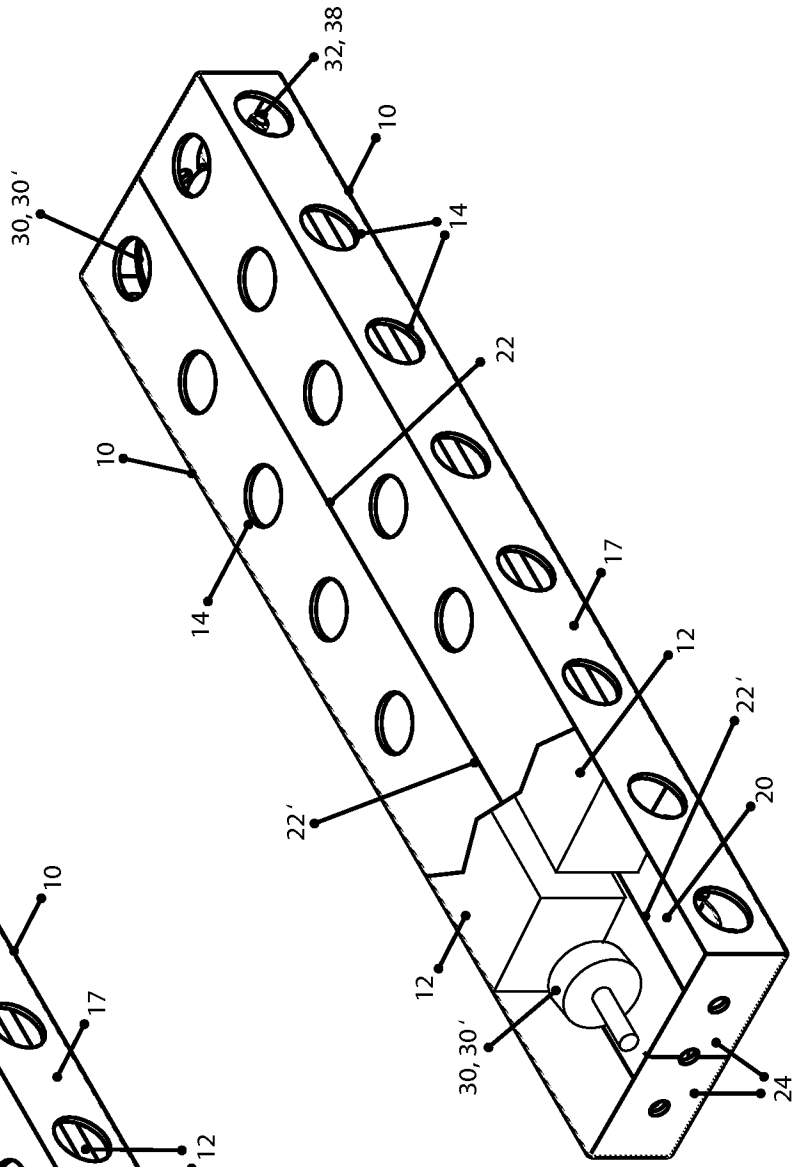

100
30, 30′
10
14
22′
32, 38
22
17
12
20
24

Fig. 6

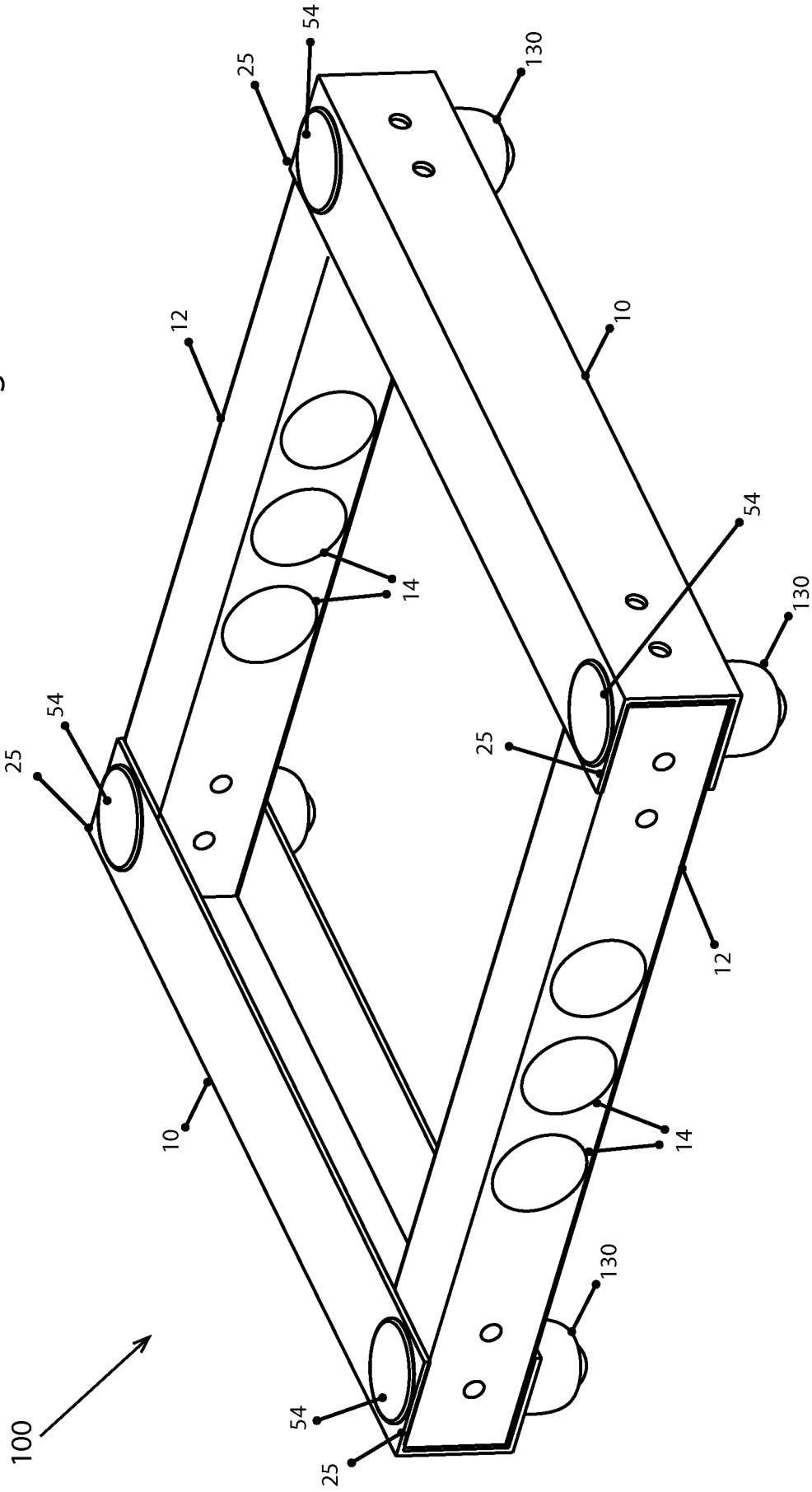
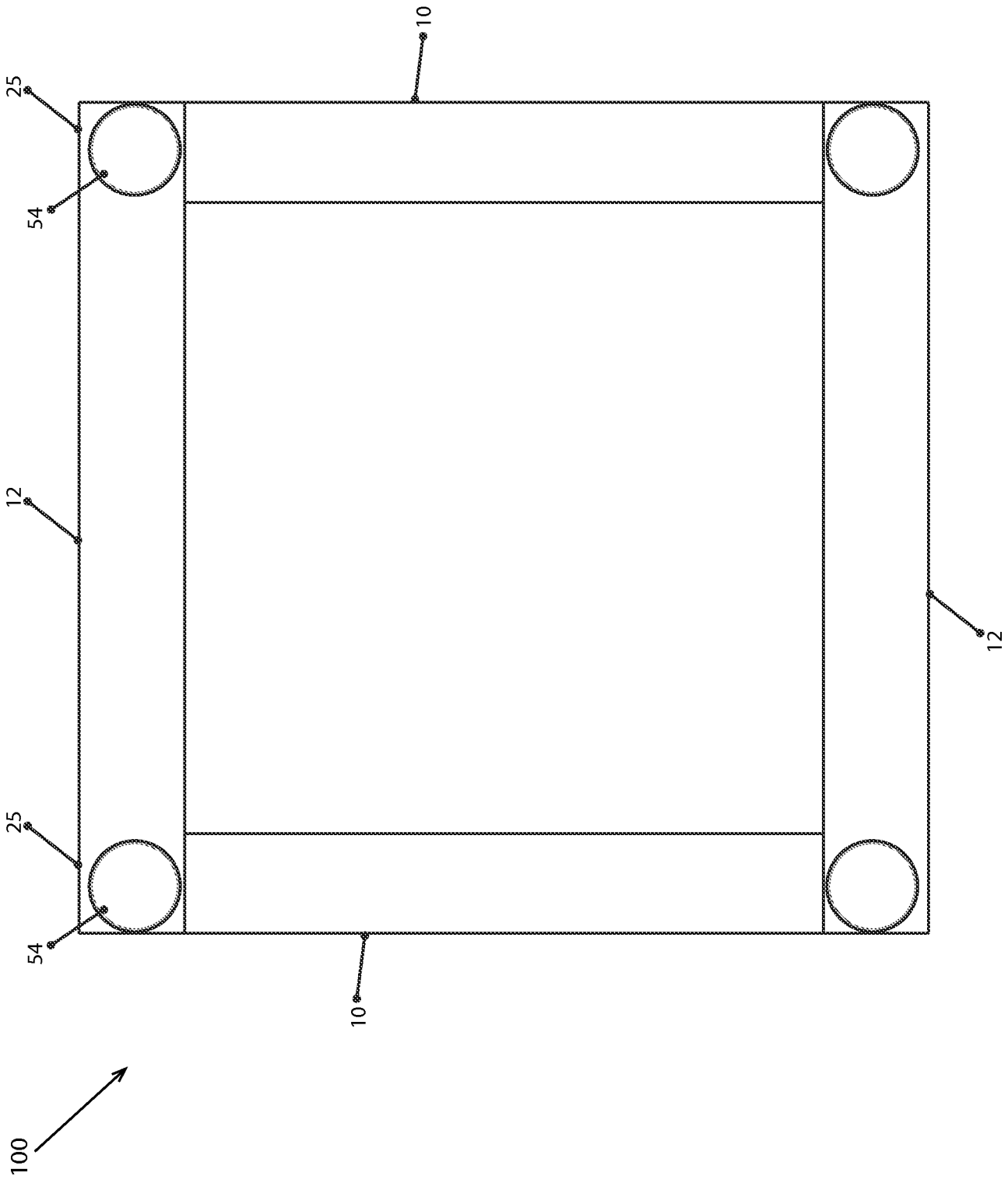


Fig. 7



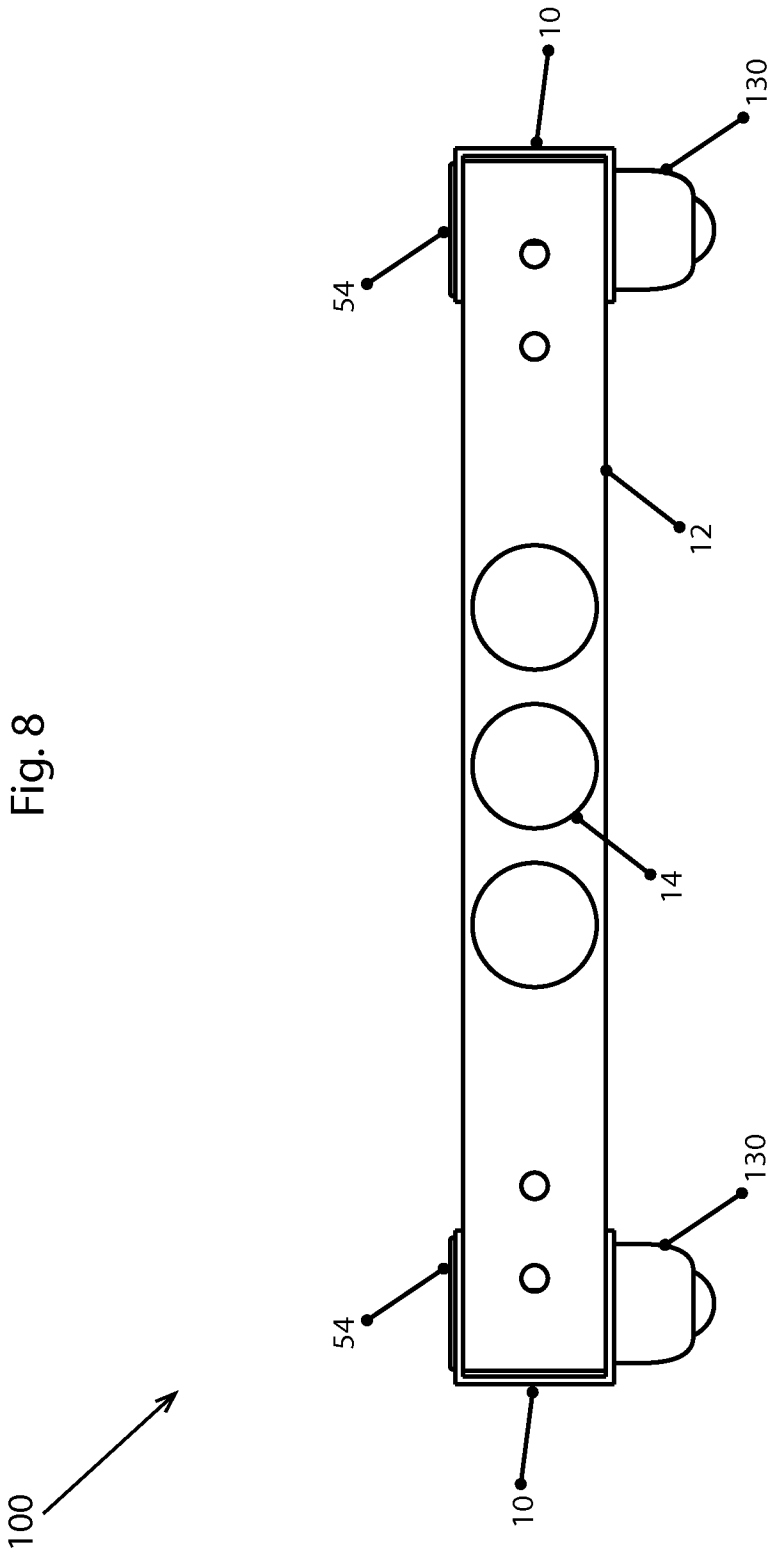


Fig. 8

Fig. 9

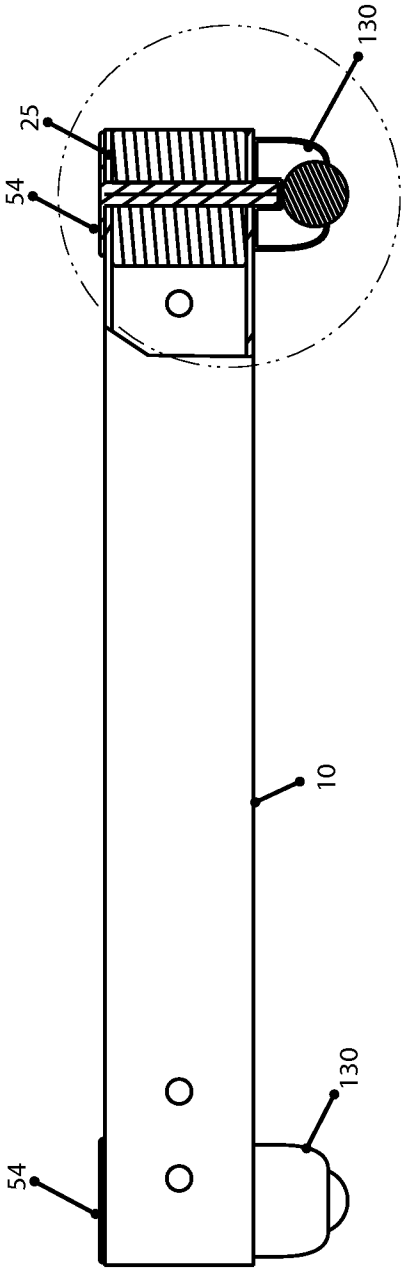


Fig. 11

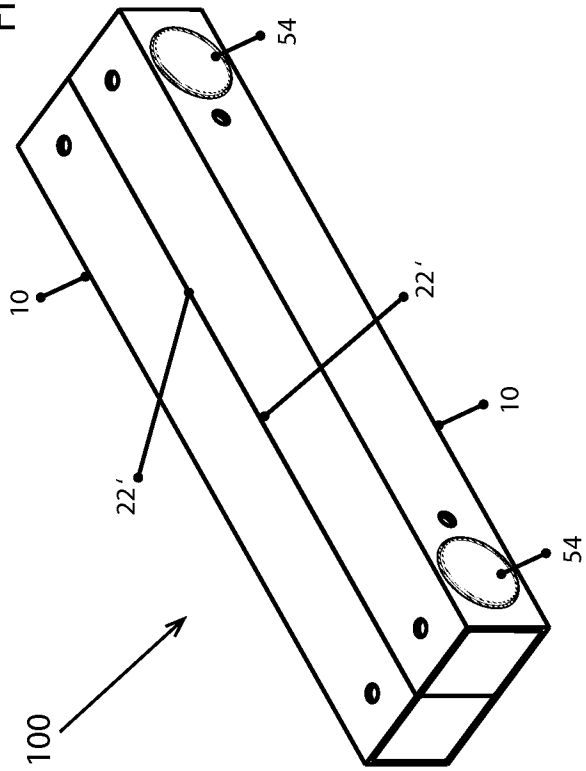
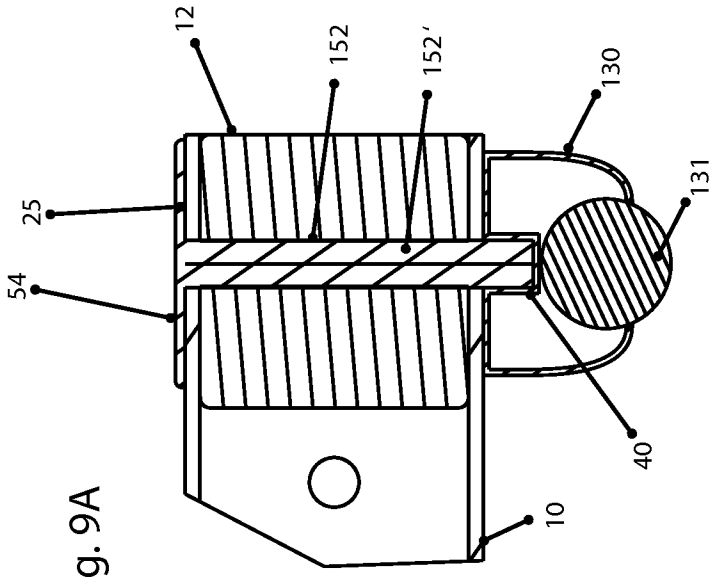


Fig. 9A



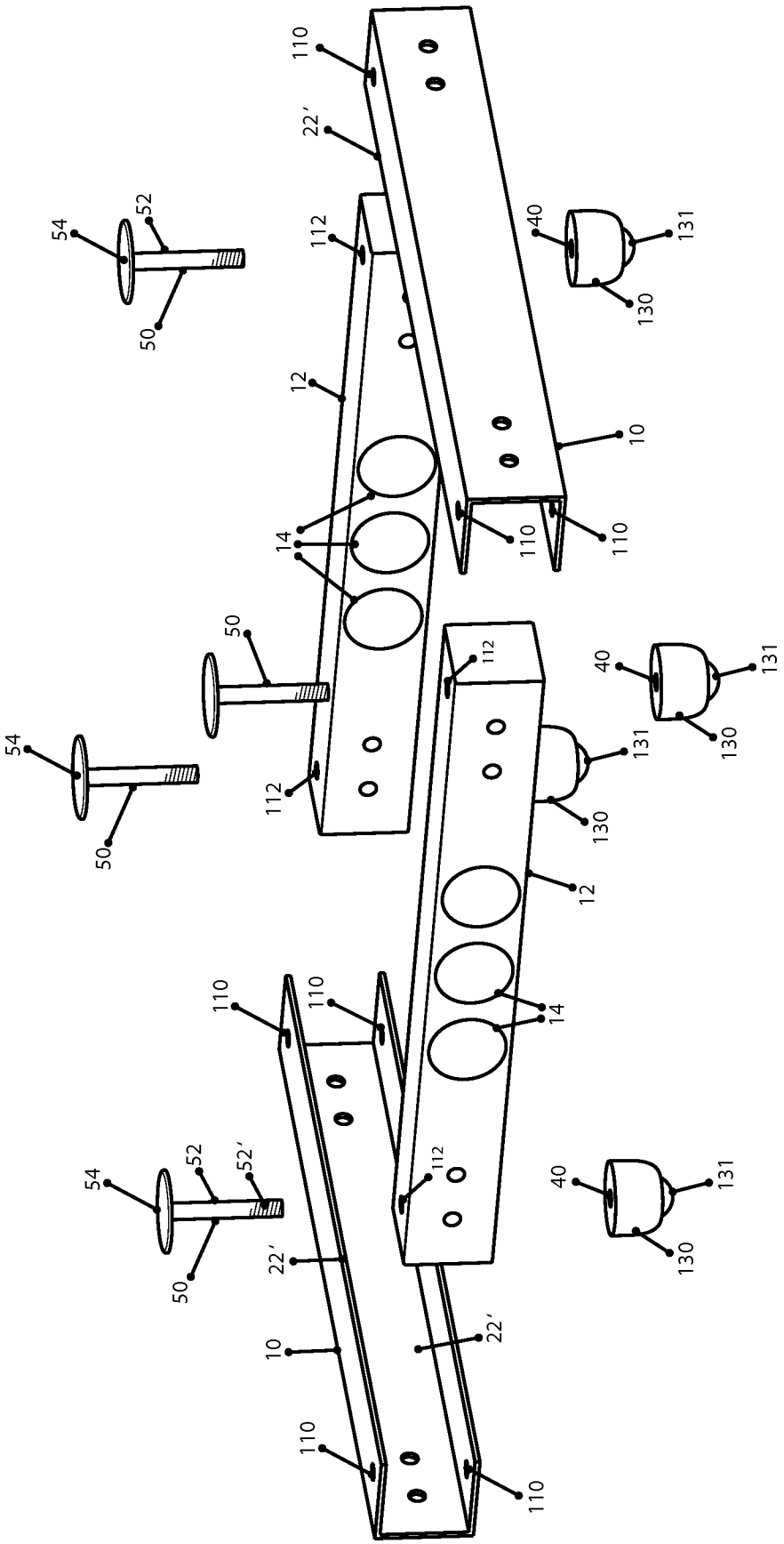
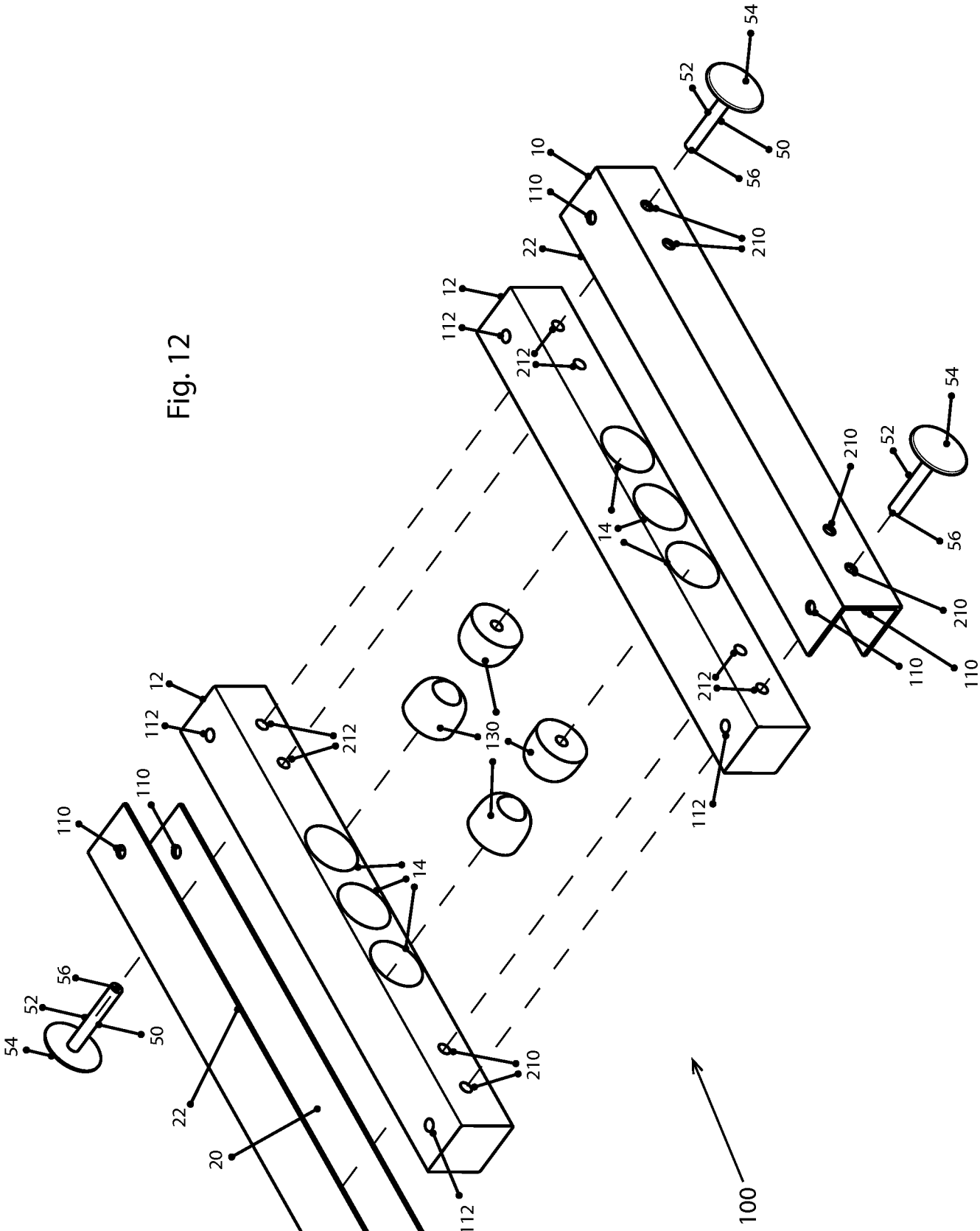

110
22'
112
40
131
130
54
52
50
12
10
14
110
110
50
112
40
131
130
54
50
112
12
110
110
14
54
52
52'
112
40
131
130
50
22'
10
22'
110
110

Fig. 10

Fig. 12



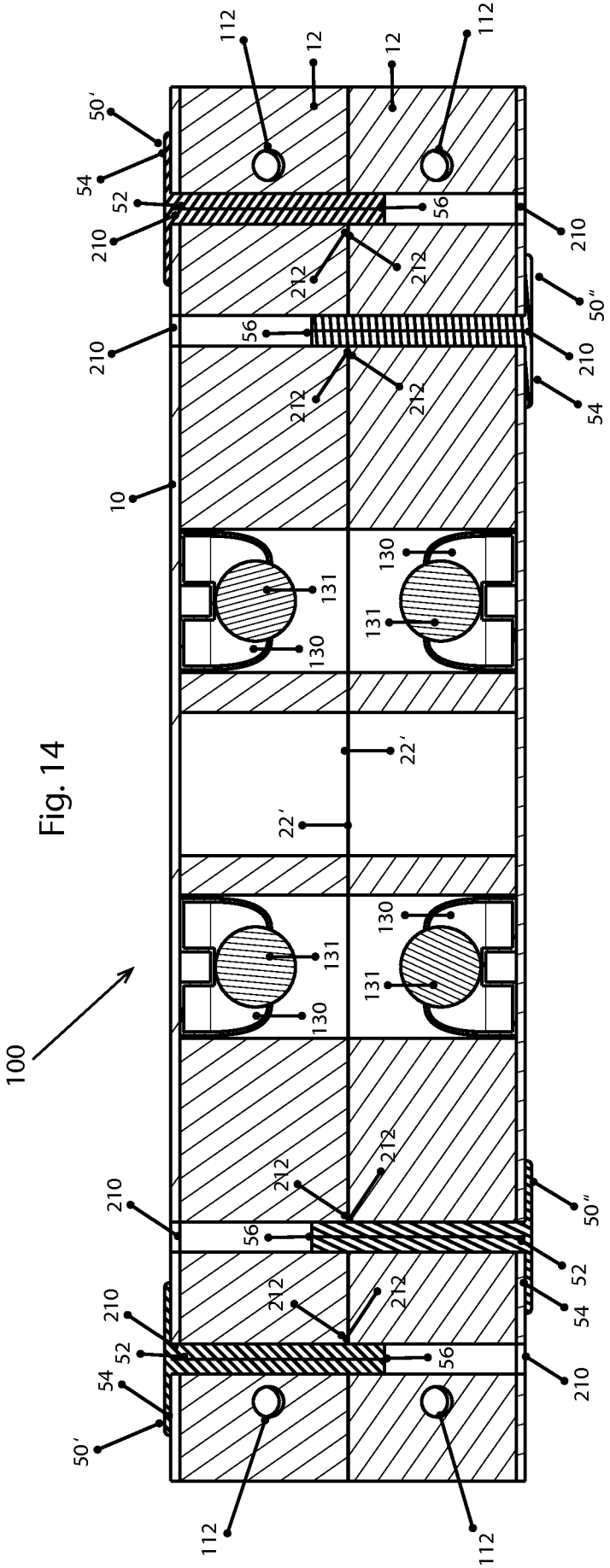

112
12
12
112
50'
54
52
210
56
212
50"
10
130
131
22'
100

Fig. 14

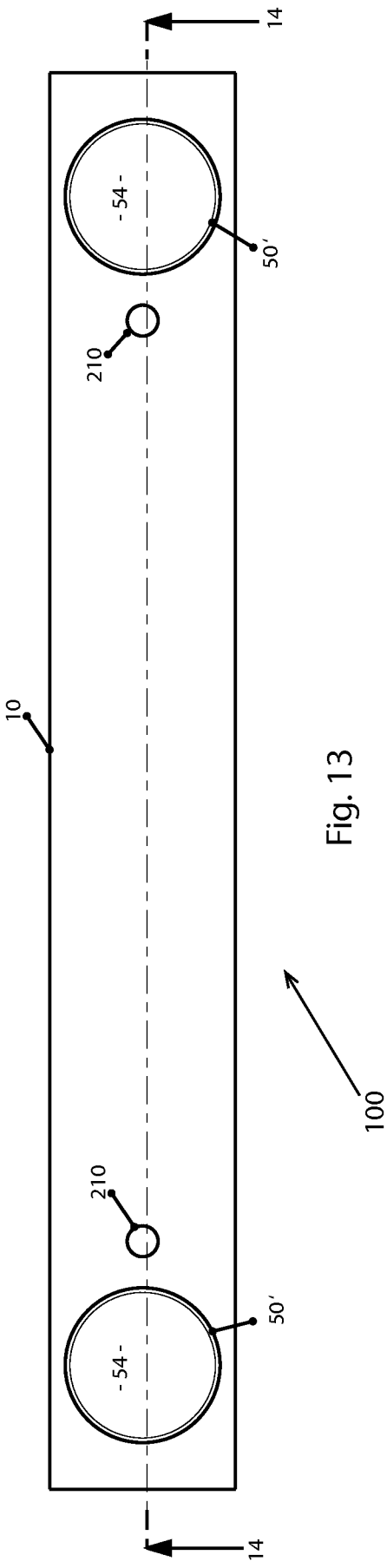

14
- 54 -
50'
210
10
100

Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/074688

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - B62B 3/02 (2014.01)
USPC - 280/639
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - B62B 1/04, 3/00, 3/02, 5/00 (2014.01)
USPC - 280/11.231, 30, 79.11, 287, 299, 302, 639, 651

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - A63C 17/06; B62B 3/00, 3/02, 5/0083, 7/12; B62H 1/00; B62K 15/006 (2014.02)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Orbit, Google Patents, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,829,765 A (SNIDER) 03 November 1998 (03.11.1998) entire document	1-20
Y	US 5,599,031 A (HODGES) 04 February 1997 (04.02.1997) entire document	1-17
Y	US 5,803,471 A (DEMARS et al) 08 September 1998 (08.09.1998) entire document	3
Y	US 2010/0237575 A1 (PRICE et al) 23 September 2012 (23.09.2012) entire document	5, 6, 9-11, 18-20
Y	US 5,318,312 A (MONTEMAYOR) 07 June 1994 (07.06.1994) entire document	11
A	US 2011/0089671 A1 (BAATZ et al) 21 April 2011 (21.04.2011) entire document	1-20
A	US 2010/0066057 A1 (JIAN) 18 March 2010 (18.03.2010) entire document	1-20
A	US 2003/0034636 A1 (NG) 20 February 2003 (20.02.2003) entire document	1-20
X, E	US 2014/0021691 A1 (BUTTAZZONI et al) 23 January 2014 (23.01.2014) entire document	1-20

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* Special categories of cited documents:
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
05 April 2014	29 APR 2014

Name and mailing address of the ISA/US	Authorized officer:
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774