(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 461 159 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.11.2024 Bulletin 2024/46

(21) Application number: **24169026.2**

(22) Date of filing: **08.04.2024**

(51) International Patent Classification (IPC):
A47B 45/00 *(2006.01)* ***B25H 3/02*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A47B 45/00; B25H 3/021; B25H 3/026

(84) Designated Contracting States:
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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **14.04.2023 SE 2350447**

(71) Applicant: **Jolit AB**
142 63 Trångsund (SE)

(72) Inventor: **ILIC, Drago**
21241 Kac (RS)

(74) Representative: **AWA Sweden AB**
Box 5117
200 71 Malmö (SE)

(54) **TELESCOPICAL SHELF**

(57) The present disclosure relates to a telescopically extendable shelf system (1), comprising: two or more shelf sections (10a-d) each having a plurality of legs (20a-d) which together support a shelf panel (13). The plurality of legs of each shelf section is arranged to slidably engage with a corresponding plurality of legs of an adjacent shelf section along respective common engagement portions (15) so as to form telescopic connections for allowing positioning each shelf section in an extended state and a collapsed state, with respect to said adjacent shelf section. At least two bearings (32, 34) are provided at each common engagement portion for interconnecting telescopically connected legs. The locking mechanisms (40) are provided so as to secure telescopically connected legs with respect to each other at each common engagement portion for allowing to secure said each shelf section to said adjacent shelf section in at least said extended state.

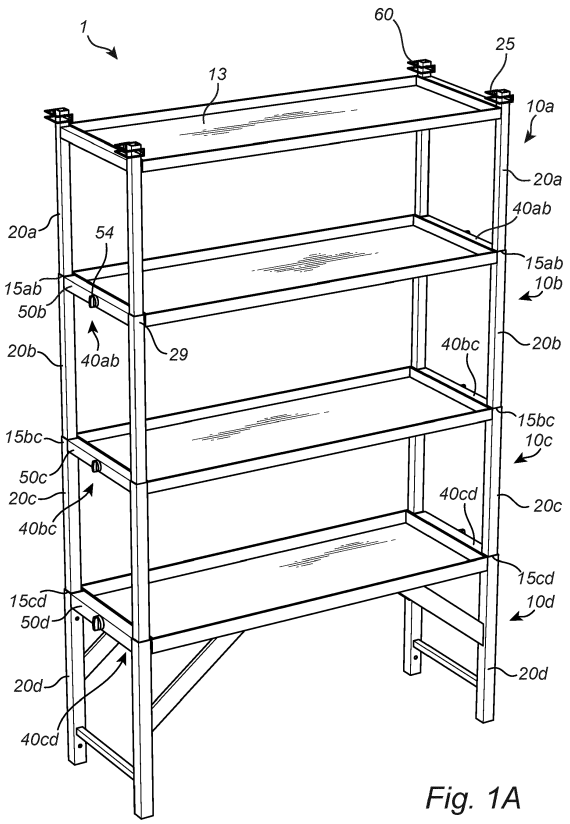


Fig. 1A

EP 4 461 159 A1

Description

Technical field

[0001] The present disclosure relates to a telescopically extendable shelf system.

Background

[0002] There is an increasing number of items and tools that requires to be stored and organized in efficient ways. Shelves are an important element in organizing and optimizing space in a room. Thereby maximizing the area that can be used in a room while still keeping good order of the items and tools. Due to the different need, dependent on which items and tools that are stored, the shelves on the market are often flexible allowing placement of the shelf panels. However, even if the shelves are flexible regarding the interior, they are often stationary at their location.

[0003] Builders and other types of labourers often works at different locations throughout the year and may stay on each work site for everything between days and months. For these kinds of labourers the storage possibilities are often limited to the storage space in their vehicle. However, this forces the labourers to move between the vehicle and the working site for picking up or leaving tools, which is not time-efficient, or to store the tools at the work site which often is not optimal. Toolboxes are one method for solving this problem, but a toolbox is limited in its storage space. The labourer may also mount a shelf at the start of the job and remove the shelf when the job is finished. However, that are neither time-efficient nor a smooth way of solving the problem.

[0004] Therefore, there is a need of better storing possibilities for labourers working at different sites throughout the year. The storing should provide a better way to organize tools and items at the site as well as being flexible and easy to install and transport.

Summary

[0005] It is an object to mitigate, alleviate or eliminate one or more of the above-identified deficiencies in the art and disadvantages singly or in any combination and solve at least the above-mentioned disadvantage in the art.

[0006] To achieve at least one of the above objects, and also other objects that will be evident from the following description, a telescopically extendable shelf system in claim 1 is provided according to the present disclosure. Preferred variants of the telescopically extendable shelf system will be evident from the dependent claims.

[0007] More specifically, according to a first aspect of the present disclosure, there is provided a telescopically extendable shelf system, comprising two or more shelf sections each having a plurality of legs which together support a shelf panel. The plurality of legs of each shelf section is structured and arranged to slidably engage with a corresponding plurality of legs of an adjacent shelf section of the two or more shelf sections along respective common engagement portions so as to form telescopic connections for allowing positioning said each shelf section in an extended state and a collapsed state, respectively, with respect to said adjacent shelf section. At least two bearings are provided at each common engagement portion for interconnecting telescopically connected legs. The at least two bearings comprise an inwardly protruding bearing which is provided on an inner surface of each leg of the plurality of legs of said each shelf section, and an outwardly protruding bearing which is provided on an outer surface of a leg of the plurality of legs of said adjacent shelf section, and wherein locking mechanisms are provided so as to secure telescopically connected legs with respect to each other at each common engagement portion for allowing to secure said each shelf section to said adjacent shelf section in at least said extended state.

[0008] It is advantageous with the at least two bearings provided at each common engagement portion as it allows the legs of the shelf to slide against the bearing when moved between the collapsed state and the extended state. Therefore, problems such that the legs getting stuck in each other and not being possible to move to the desired position will be reduced. The bearings will also allow the telescopically shelf to be collapsed by releasing the locking mechanism and then let the shelf section slide from the extended state to the collapsed state by the force of gravity due to the bearings providing the smoother movement. Furthermore, the bearings allow a tighter fit for the legs being extended as these can have direct contact with the bearings without getting stuck in its position. This facilitates the stability of the shelf sections in the extended state and therefore also the stability of the telescopically extendable shelf system. The stability of a shelf is an important feature as all kind of items are stored at a shelf and this feature is even more important for a shelf which is moved between different sites, ordinary shelves may be mounted in their position, to the floor or wall, to provide the necessary stability.

[0009] The locking mechanism secures the telescopically connected legs together such that they are locked in the extended state. Thus, the locking mechanism may further increase the stability of each shelf section.

[0010] By configuring said each shelf section in the collapsed state with respect to said adjacent shelf section, the telescopically extendable shelf system may be easier to move and possible to bring in a vehicle out to a work site where

it is installed. This flexibility may be advantageous for labourers with non-stationary work site as the shelf system is both easy to bring and as it provides an easy way to organize storing space which may improve the order at the work site and hence the efficiency of the labourer.

[0011] The telescopic feature may be achieved by each leg of one of the shelf sections being telescopically connected to a corresponding leg of an adjacent shelf section. Hence, the legs of each shelf section have a reduced circumference for each level of shelf section such that it fits in the legs of the shelf section that are below in an upright position of the telescopically extendable shelf system. Thereby an inwardly arranged telescopic leg and an outwardly arranged telescopic leg is provided. The inwardly arranged telescopic leg protrudes into the outwardly arranged telescopic leg to provide a telescopic connection. The inwardly arranged telescopic leg and the outwardly arranged telescopic leg together define a common engagement portion. The common engagement portion is defined as the volume where the inwardly arranged telescopic leg overlaps with, or protrudes into, the outwardly arranged telescopic leg. Therefore, the length of the common engagement portion may vary depending on if said each shelf section is in the collapsed state or in the extended state. In the collapsed state, a majority of each leg of one of said each shelf section is inside a corresponding leg of said adjacent shelf section.

[0012] Each of the at least two bearings provided at each common engagement portion may be a ball bearing, a roll bearing or other suitable type of bearing. As is understood by the skilled person, the type of bearing is not limiting for the invention.

[0013] Both an inwardly protruding bearing provided on the outwardly arranged leg and an outwardly protruding bearing provided on the inwardly arranged leg at the common engagement portion, may be advantageous as each common engagement portion will have two points of support surfaces between the legs which may further increase the stability of the shelf sections and thus, the telescopically extendable shelf system. The bearings may be integrally formed with the leg or mounted to the leg.

[0014] The outwardly protruding bearing may be located at an outer surface of the inwardly arranged leg and may be positioned at an end of the inwardly arranged leg that protrudes into the outwardly arranged leg. The inwardly protruding bearing may be located at an inner surface of the outwardly arranged leg and may be positioned at an end of the outwardly arranged leg that is enclosing the inwardly arranged leg. The above implies that said end of the inwardly arranged leg and said end of the outwardly arranged leg defines the boundaries of the telescopic connection along its extension. In other words, said end of the inwardly arranged leg and said end of the outwardly arranged leg defines the boundaries of the common engagement portion. This further implies that the common engagement portion has a variable extension. When said each shelf section is in the extended state, the common engagement portion will have a larger extension, than when said each shelf section is in the collapsed state.

[0015] As readily appreciated by the person skilled in the art, a leg which in one telescopic connection is the outwardly arranged leg may in another telescopic connection be the inwardly arranged leg. This implies that the leg may have two telescopic connections with two different shelf sections. In such case it may be advantageous that the leg is provided with two bearings, one for each telescopic connection.

[0016] The two or more shelf sections may comprise a top shelf section and a base shelf section. Each of the plurality of legs of the base shelf section may have a respective foot portion which presents a respective hollow portion. Each of the plurality of legs of the top shelf section may have a respective locking portion. The telescopically extendable shelf system may be structured and arranged such that locking portions of the plurality of legs of the top shelf section can form a geometrically complementary engagement with associated hollow portions of a plurality of legs of a base shelf section of a further telescopically extendable shelf system so as to allow stacking the further telescopically extendable shelf system on top of the telescopically extendable shelf system.

[0017] The hollow portion of the base shelf section and the locking portion of the top shelf section allow stacking of two or more telescopically extendable shelf system, both in the extended state and the collapsed state. It may be advantageous that one telescopically extendable shelf system can be stacked with a further telescopically extendable shelf system when the shelf sections are in the collapsed state, as it allows for a space efficient, safe, and reliable storage when the telescopically extendable shelf systems are not used. By positioning the shelf section in the collapsed state and thereafter stacking the telescopically extendable shelf system at each other, a plurality of telescopically extendable shelf systems may be stored at the same space as one telescopically extendable shelf system. This may further be advantageous during transport of the telescopically extendable shelf systems as it reduces the space needed. Furthermore, it may be advantageous to stack the telescopically extendable shelf systems in the extended state, as it allows to increase the storage space by adding one or more additional telescopically extendable shelf system at the first one. Hence, by adding the possibility to stack a plurality of telescopically extendable shelf systems the flexibility of the system may be increased. The provision of the hollow portion of the base shelf section and the locking portion of the top shelf section allows keeping two or more telescopically extendable shelf systems together also during transport, as it enables the telescopically extendable shelf systems to engage with each other.

[0018] The telescopically extendable shelf system may further comprise a locking arrangement configured to secure the further telescopically extendable shelf system to the telescopically extendable shelf system when stacked.

[0019] By securing the telescopically extendable shelf system to the further telescopically extendable shelf system with the locking arrangement, the stability of the stacked shelf systems may be further increased. When transporting a plurality of stacked telescopically extendable shelf systems in a vehicle, bumps may cause the vehicle to rock. The locking arrangement locks the two shelf systems together such that the shelf systems may not fall off from their stacked position. This may increase the safety as the load of the vehicle will stay in its desired position.

[0020] The shelf panel of at least one of the two or more shelf sections may be connected to its plurality of legs at or close to free ends thereof, which free ends do not protrude into a plurality of legs on an adjacent shelf section.

[0021] It may be advantageous to connect the shelf panel to the free ends of the plurality of legs as it allows utilizing the full potential of the telescopic connection when the shelf sections of the telescopically extendable shelf system are in the collapsed state. With the free ends is herein meant the ends that do not form part of the common engagement portions in which the legs protrude into another shelf section. The shelf panel may be connected to its plurality of legs at the free ends thereof but may alternatively be connected to its plurality of legs at a distance from the free ends thereof. The latter example embodiment allows the plurality of legs to extend to some degree beyond the position of the shelf panel in a direction away from the common engagement portion at which the plurality of legs protrudes into a plurality of legs on an adjacent shelf section.

[0022] The locking mechanisms may comprise locking elements arranged at each common engagement portion and configured to be displaceable between unlocked positions at which said each shelf section may be displaceable in relation to said adjacent shelf section, and locked positions at which said each shelf section is secured to said adjacent shelf section.

[0023] The locking elements at each common engagement portion may be advantageous as they provide a locking function to each telescopically connected leg which may ensure that each leg is locked in a desired state.

[0024] The locking elements, in the unlocked positions, may be arranged outside of the common engagement portions of telescopically connected legs and configured to protrude through overlapping openings provided in said telescopically connected legs from the outside and in to reach the locked positions.

[0025] It may be advantageous with locking elements arranged outside of the common engagement portions as it facilitate maintenance of the locking elements and also facilitates the troubleshooting if a problem with the locking mechanism would occur. For example, if one of the locking elements would be stuck in any position, there is no need to open the leg to investigate which locking element that caused the problem. The repair of the locking element may thus be performed without opening the leg in the telescopic connection.

[0026] The locking elements may present rounded, or tapered, heads. It may be advantageous with rounded or tapered heads as these may slide smoothly along the common engagement portion while moving the shelf section between the collapsed state and the extended state. Furthermore, when the head is presented to the overlapping opening the rounded or tapered head may allow the locking element to gradually start engaging the opening while it is moved towards it. With sharp edges the locking element would need to be fully overlap with the opening before the engagement is achieved. It may also be advantageous when moving the locking element to unlock the shelf section, as the rounded or tapered head may start sliding before it has been fully moved out from the opening which may facilitate the unlocking process by reducing the power needed to unlock the locking elements. A tapered head may have a frustoconical shape. A rounded head may have a spherical shape.

[0027] Pairs of locking elements may be provided inside interconnecting frame parts of a shelf section which interconnecting frame parts interconnects pairs of adjacent legs of its plurality of legs. Each locking element of a pair of locking elements may be configured to secure a corresponding one of a pair of adjacent legs.

[0028] It may be advantageous with interconnecting frame parts that includes pair of locking elements for a pair of adjacent legs as it interconnects the locking mechanism for the pair of adjacent legs such that they can be unlocked together. Thereby, unbalances between the legs due to unlocking one of them before the other one may be reduced. In other words, the risk that one of the locking elements unlocks one leg before the other leg may be mitigated or at least reduced.

[0029] Each locking element of a pair of locking elements may be coupled to a respective lever arranged to be accessible from outside of the interconnecting frame part so as to allow unlocking said pair of adjacent legs by pushing said respective levers toward each other.

[0030] It may be advantageous to allow unlocking the pair of adjacent legs simultaneously by moving the levers toward each other as it simplifies the process of unlocking the shelf section. Thereby it is possible to unlock the pair of adjacent legs with a movement from one hand, and thereby allowing to unlock two pairs of adjacent legs with movements from two hands. For a telescopically extendable shelf system having four corners defined by two pairs of adjacent legs, this thus allows one user, without requiring further assistance, to unlock a whole shelf section with respect to an adjacent shelf section. The levers may be connected directly to the locking element. However, the levers may alternatively be connected to the locking element through other types of elements. For example, the lever may push/pull another element that in turn pushes/pulls the locking element. In some embodiments there may be only one lever that is moved in one direction to unlock both of the locking elements.

[0031] Each interconnecting frame part may comprise a respective spool which is mechanically coupled to an associated pair of locking elements and arranged to be rotatable from outside of the interconnecting frame part so as to allow unlocking a pair of adjacent legs by rotating the spool.

[0032] It may be advantageous with a spool instead of levers as it allows to fully seal the interconnecting frame part. Thereby dust entering the interconnecting frame part and the locking mechanism may be prevented. The spool is rotated to move the locking elements and therefore only a part of the spool need to protrude through the interconnecting frame part which allow and there is no need of a track to move the spool axially. Therefore the opening in the interconnecting frame part may be smaller than when a lever is used. By rotating the spool, the locking elements can be moved out from the overlapping openings and thereby unlocking the pair of adjacent legs.

[0033] Each locking element of a pair of locking elements may be supported in relation to their associated interconnecting frame part by means of at least one bearing.

[0034] With the bearings supporting the locking elements the movement of the locking element may be facilitated. This may be advantageous as it reduces the power needed for unlocking the locking mechanism. The bearing may be installed both directly towards the locking element or towards an intermediate element which may be moved together with the locking element.

[0035] In some embodiments, the locking elements, in the unlocked positions, may be arranged inside the common engagement portions of telescopically connected legs and configured to protrude through overlapping openings provided in said telescopically connected legs from the inside and out to reach the locked positions.

[0036] It may be advantageous to arrange the locking elements inside the common engagement portions as it allows the telescopically extendable shelf system to be provided with a sleeker and/or more stripped design. Moreover, it allows providing a telescopically extendable shelf system which is less complex. The locking elements may be manually pushed into the legs from the overlapping openings of the telescopically connected legs to allow movement of the shelf sections between the extended state and the collapsed state.

[0037] The locking elements may be spring-biased towards their locked positions. This may be advantageous as they will be biased towards the position where they protrude into the overlapping openings, thereby removing the need to use a force to lock the locking elements. Instead, the locking elements will by the biasing automatically enter the overlapping openings when the desired state is reached.

[0038] The telescopically extendable shelf system may further comprise, for each common engagement portion, a seal arranged adjacent to the common engagement portion and in attachment with a telescopically connected leg associated therewith, said seal being configured to seal the common engagement portion from the ambient environment.

[0039] It may be advantageous with a seal configured to seal the common engagement portion from the ambient environment as it prevents dust and other particles from entering the common engagement portion, thereby reducing the wear of the telescopically connected legs. Furthermore, the seal may provide a barrier such that fingers, hair and clothes may not get stuck between the inwardly arranged telescopic leg and the outwardly arranged telescopic leg. The seal may in other words also functions as a safety feature.

[0040] The seal may be arranged at the free end of the outwardly arranged telescopic leg such that the seal engages the inwardly arranged telescopic leg.

[0041] The present disclosure may also in short be described as a telescopically extendable shelf system, comprising two or more shelf sections each having a plurality of legs which together support a shelf panel. The plurality of legs of each shelf section is structured and arranged to slidably engage with a corresponding plurality of legs of an adjacent shelf section of the two or more shelf sections along respective common engagement portions so as to form telescopic connections for allowing positioning said each shelf section in an extended state and a collapsed state, respectively, with respect to said adjacent shelf section. At least one bearing is provided at each common engagement portion for interconnecting telescopically connected legs, and locking mechanisms are provided so as to secure telescopically connected legs with respect to each other at each common engagement portion for allowing to secure said each shelf section to said adjacent shelf section in at least said extended state.

[0042] The at least one bearing may comprise an inwardly protruding bearing which is provided on an inner surface of each leg of the plurality of legs of said each shelf section, and/or an outwardly protruding bearing which is provided on an outer surface of a leg of the plurality of legs of said adjacent shelf section.A further scope of applicability of the present disclosure will become apparent from the detailed description given below. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the disclosure, are given by way of illustration only, since various changes and modifications within the scope of the disclosure will become apparent to those skilled in the art from this detailed description.

[0043] Hence, it is to be understood that the present disclosure is not limited to the particular component parts of the device described or steps of the methods described as such device and method may vary. It is also to be understood that the terminology used herein is for purpose of describing particular embodiments only, and is not intended to be limiting.

Brief description of the drawings

[0044] The present disclosure will by way of example be described in more detail with reference to the appended drawings, which show example embodiments of the disclosure.

Fig. 1A	illustrates a telescopically extendable shelf system in the extended state.
Fig. 1B	illustrates the telescopically extendable shelf system in the collapsed state.
Fig. 2	illustrates a shelf section with bearings.
Fig. 3	illustrates an embodiment of a locking mechanism.
Fig. 4A-4C	illustrates a sequence for unlocking the locking mechanism.
Fig. 5	illustrates a second embodiment of the locking mechanism.
Fig. 6	illustrates a third embodiment of the locking mechanism.
Fig. 7	illustrates a plurality of telescopically extendable shelf systems stacked on each other.

Detailed description

[0045] The present disclosure will now be described more fully hereinafter with reference to the accompanying drawings, in which currently preferred embodiments of the disclosure are shown. This disclosure may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided for thoroughness and completeness, and fully convey the scope of the disclosure to the skilled person.

[0046] Turning to Fig. 1A and Fig. 1B there is disclosed a telescopically extendable shelf system 1. In Fig. 1A the telescopically extendable shelf system 1 is in an extended state and in Fig. 1B the telescopically extendable shelf system 1 is in a collapsed state. The telescopically extendable shelf system 1 comprises four shelf sections 10a-d which each has four legs 20a-d that supports a respective shelf panel 13. The legs 20a-d of each shelf sections 10a-d is connected to at least one corresponding set of legs 20a-d of an adjacent shelf section 10a-d. As an example, the legs 20a of the shelf section 10a is connected to the corresponding set of legs 20b of the adjacent shelf section 10b. The legs 20a-d of each shelf section 10a-d is structured and arranged to slidably engage with a corresponding plurality of legs 20a-d of an adjacent shelf section 10a-d along respective common engagement portions 15ab, 15bc, 15cd so as to form telescopic connections. This allows positioning each shelf section 10a-d in an extended shelf state, see Fig. 1A, and a collapsed shelf state, see Fig. 1B. In Fig. 1A and Fig. 1B, all shelf sections 10a-d are positioned in the same state. However, the shelf sections 10a-d may be in different states compared to each other. When all the shelf sections 10a-d are in their extended shelf state, the telescopically extendable shelf system 1 will be in the extended state. When all the shelf sections 10a-d are in their collapsed shelf state, the telescopically extendable shelf system 1 will be in the collapsed state.

[0047] The telescopic connection is achieved in that the legs 20a-d of each shelf section 10a-d have a reduced circumference, compared to the legs 20a-d of the shelf section 10a-d below, for each level of shelf section 10a-d such that it fits in the legs 20a-d of the shelf section 10a-d that are below when the telescopically extendable shelf system 1 is in an upright position. In other words, it could be described as that the legs 20a-d can act as an inwardly arranged telescopic leg and an outwardly arranged telescopic leg in the common engagement portion 15ab, 15bc, 15cd. For example, the legs 20a of the shelf section 10a are inwardly arranged telescopic legs 20a that protrudes into the outwardly arranged telescopic legs 20b of the adjacent shelf section 10b thereby providing telescopic connections between shelf sections 10a and 10b. The inwardly arranged telescopic legs 20a and the outwardly arranged telescopic legs 20b together define the common engagement portions 15ab. A common engagement portion 15ab is defined as the volume where an inwardly arranged telescopic leg 20a overlaps with, or protrudes into, an outwardly arranged telescopic leg 20b. Therefore, the length of the common engagement portion 15ab may vary depending on if said each shelf section 10a-d is in the collapsed shelf state or in the extended shelf state. In the collapsed shelf state, a majority of each leg 20a of one of said each shelf section 10a is inside a corresponding leg 20b of said adjacent shelf section 10b. Although described in detail for the shelf sections 10a and 10b, hereinabove, the person skilled in the art realises that the same structural and functional relationships hold for shelf section 10c and 10d, or any other shelf section for not shown example embodiments falling within the scope of the claims.

[0048] As readily appreciated by the person skilled in the art, the legs 20a-d of a shelf section 10a-d may act as inwardly arranged telescopic legs at one end and as outwardly arranged telescopic legs at another opposite end. Structurally, the legs 20a-d of each shelf section 10a-d may be the same, or at least substantially the same, apart from their different circumference so as to provide the telescopic connections between the shelf sections 10a-d.

[0049] To utilize the full potential of the telescopic connection, i.e. to achieve a maximum height difference between the extended state and the collapsed state, the shelf panel 13 of the shelf sections 10a-d are connected to its plurality

of legs 20a-d at or close to free ends 29 thereof. The free ends 29 of the legs 20a-d are herein defined as the ends of the legs 20a-d which do not protrude into a plurality of legs 20a-d of an adjacent shelf section 10a-d. The shelf panel 13 may be connected to its plurality of legs 20a-d at the free ends 29 thereof but may alternatively be connected to its plurality of legs 20a-d at a distance from the free ends 29 thereof.

[0050] One shelf section 10a of the telescopically extendable shelf system 1 is a top shelf section 10a which only connects to one adjacent shelf section below the same, namely shelf section 10b, and therefore only has telescopic connections where the legs 20a are inwardly arranged legs. During use, the top shelf section 10a is the shelf section 10a at the highest level. Another shelf section 10d of the telescopically extendable shelf system 1 is a base shelf section 10d which only connects to one adjacent shelf section above the same, namely shelf section 10c, and therefore only has telescopic connections where the legs 20d are outwardly arranged legs. During use, the base shelf section 10d is the shelf section 10d at the lowest level. The shelf sections 10b and 10c located in-between the top shelf section 10a and the base shelf section 10d will have telescopic connections disposed both upwardly and downwardly. For example, the shelf section 10b will have four telescopic connections with an adjacent shelf section 10a on a level above where the legs 20b of the shelf section 10b are the outwardly arranged legs and four telescopic connections with an adjacent shelf section 10c on a level below where the legs 20b of the shelf section 10b are the inwardly arranged legs.

[0051] A locking mechanism 40ab, 40bc, 40cd is provided for the shelf sections 10a-d so as to secure telescopically connected legs with respect to each other at each common engagement portion 15ab, 15bc, 15cd and for allowing to secure one shelf section 10a-d to the adjacent shelf section 10a-d in the extended state. As can be seen in Fig. 1, the locking mechanisms 40ab, 40bc, 40cd are forming part of shelf sections 10b, 10c, and 10d, respectively. The locking mechanism 40ab, 40bc, 40cd can be unlocked to allow the telescopically extendable shelf system 1 to be moved into the collapsed state. Each locking mechanism 40ab, 40bc, 40cd operates a pair of legs. Therefore, each shelf section 10a-d is provided with opposite arranged locking mechanisms 40ab, 40bc, 40cd that operates opposite pair of legs. As readily appreciated by the person skilled in the art, collapsing a shelf section with respect to another shelf section for the present example embodiment will require manoeuvring both locking mechanisms 40ab in Fig. 1A at the same time so as, for example, to unlock all four legs 20a with respect to all four legs 20b.The locking mechanism 40ab, 40bc, 40cd will be further discussed in connection to Fig. 3-5.

[0052] Each of the legs 20d of the base shelf section 10d have a foot portion 23 with a respective hollow portion 24, as illustrated in Fig. 1B. Each hollow portion 24 is configured to form a geometrically complementary engagement with a locking portion 25 of the top shelf section 10a of a further telescopically shelf system 1. This allows stacking a further telescopically extendable shelf system 1 on the telescopically extendable shelf system 1, which will be further discussed in connection to Fig. 7.

[0053] Turning to Fig. 2, one shelf section 10 is illustrated with enlarged example embodiments of at least two bearings 32, 34 which is provided at each common engagement portion 15ab, 15bc, 15cd for interconnecting telescopically connected legs. The at least two bearings 32, 34 is located on the legs 20a-d forming the common engagement portion 15ab, 15bc, 15cd. The at least two bearings 32, 34include an inwardly protruding bearing 32 which is provided on an inner surface 24 of each leg 20a-d of a shelf section 10a-d, and an outwardly protruding bearing 34 which is provided on an outer surface 26 of each leg 20a-d of an adjacent shelf section 10a-d. For intermediate shelf sections which connects to adjacent shelf sections upwardly as well as downwardly, i.e. shelf sections 10b and 10c of the present example embodiment, this implies that there are two bearings arranged on each of the legs 10b, 10c. Fig. 2 illustrates this for shelf section 10b. The outwardly protruding bearing 34 is arranged at an enclosed end 21 of a leg 20b, where the leg 20b acts as the inwardly arranged leg that protrudes into an outwardly arranged leg 20c of the adjacent shelf section 10c (not shown). The inwardly protruding bearing 32 is arranged at the free end 25 of leg 20b where the leg 20b acts as the outwardly arranged leg that is enclosing the inwardly arranged leg 20a of the adjacent shelf section 10a (not shown). The above implies that said enclosed end 21 of the inwardly arranged leg and said free end 25 of the outwardly arranged leg defines the boundaries of the telescopic connection along its extension. This further implies that the common engagement portion 15ab, 15bc, 15cd has a variable extension. When said each shelf section 10a-d is in the extended shelf state, the common engagement portion 15ab, 15bc, 15cd will have a larger extension, than when said each shelf section 10a-d is in the collapsed shelf state. This is best viewed in Figs 4A-4C.

[0054] The at least two bearings 32, 34 allows the legs 20a-d of the shelf section 10a-d to slide against the at least two bearings 32, 34 when moved between the collapsed state and the extended state. The at least two bearings 32, 34 will also allow the telescopically extendable shelf system 1 to be collapsed by releasing the locking mechanisms 40ab, 40bc, 40cd and thereby allowing the shelf section 10a-d to slide from the extended state to the collapsed state by the force of gravity and due to the at least two bearings 32, 34 providing a smoother movement. The at least two bearings 32, 34 in Fig. 2 is illustrated as a ball bearing. However, it should be noted that a roll bearing or other suitable type of bearing may be used as well. As is understood by the skilled person, the type of bearing is not limiting for the invention.

[0055] As already mentioned, Fig. 2 illustrates an example of an intermediate shelf section (in the example: shelf section 10b) which is located in-between the top shelf section 10a and the base shelf section 10d in Fig. 1A. As understood by the skilled person, since the top shelf section 10a and the base shelf section 10d only have common engagement

portions 15ab, 15cd connecting to one adjacent shelf section (shelf section 10b or 10c in the example embodiment), they may only have one bearing 32, 34 per leg 20a, 20d. Preferably, an inwardly protruding bearing 32 at the legs 20d of the base shelf section 10d and an outwardly protruding bearing 34 at the legs 20 of the top shelf section 10a. Furthermore, it should be noted that only one bearing 32, 34 may be used at each common engagement portion 15ab, 15bc, 15cd. The position of that bearing 32, 34 is a preference, and it may be provided on either an inwardly arranged leg 20a-d or on an outwardly arranged leg 20a-d. However, it may be advantageous with two bearings 32, 34 at each common engagement portion 15ab, 15bc, 15cd as each common engagement portion 15ab, 15bc, 15cd will have two points of support surfaces between the legs 20a-d which may further increase the stability of the shelf sections 10a-d and thus, the telescopically extendable shelf system 1. The common engagement portion 15ab, 15bc, 15cd is limited by the inwardly protruding bearing 32 and the outwardly protruding bearing 34. In the enlarged figure of Fig. 2 which illustrates the telescopic connections for a leg 20b of shelf section 10b, it is illustrated how the inwardly protruding bearing 32 is arranged on the outwardly arranged leg 10b in the telescopic connection with adjacent shelf section 10a, i.e. in the common engagement portion 15ab, and how the outwardly protruding bearing 34 is supporting the outwardly arranged leg 20c in the telescopic connection with adjacent shelf section 10c, i.e. in the common engagement portion 15bc. An outwardly protruding bearing 34 is also arranged on the inwardly arranged leg 20a of shelf section 10a in the telescopic connection and the outwardly protruding bearing 34 is supporting the outwardly arranged leg 20b. Hence, the two points of support are achieved.

[0056] The telescopically extendable shelf system 1 further comprises, for each common engagement portion 15ab, 15bc, 15cd, a seal 80 arranged adjacent to the common engagement portion 15ab, 15bc, 15cd and in attachment with a telescopically connected leg 20a-d associated therewith. The seal 80 is configured to seal the common engagement portion 15ab, 15bc, 15cd from the ambient environment. The seal 80 is configured to prevent dust and other particles from entering the common engagement portion 15ab, 15bc, 15cd. The seal 80 is arranged at the outwardly arranged leg 20a-d and configured to abut the inwardly arranged leg 20a-d of the adjacent shelf section 10a-d in the telescopic connection. For the shelf section 10b illustrated in Fig. 2, a respective seal 80 will thus be arranged at each leg 20b of the shelf section 10b and be configured to abut the inwardly arranged leg 20a of the adjacent shelf section 10a.

[0057] Turning to Fig 3, a first embodiment of the locking mechanism 40ab, 40bc, 40cd and its individual parts are illustrated. For the example embodiment, six locking mechanisms 40ab, 40bc, 40cd are provided, two for each connection to an adjacent shelf section. Thus, for the connection between top shelf section 10a and shelf section 10b, there is provided one pair of locking mechanisms 40ab, for the connection between shelf section 10b and shelf section 10c, there is provided another pair of locking mechanisms 40bc, and for the connection between shelf section 10c and base shelf section 10d, there is provided yet another pair of locking mechanisms 40cd. For the example embodiment, the locking mechanisms 40ab, 40bc, 40cd are provided in shelf sections 10b, 10c and 10d, respectively. Each shelf section 10a-d comprises interconnecting frame parts 50a-d which are configured to interconnect pairs of adjacent legs 20a-d. This is best illustrated in Fig. 1A. Each interconnecting frame part 50a-d are arranged to interconnect two pair of legs 20a-d of each shelf section 10a-d. The locking mechanisms 40ab, 40bc, 40cd are provided inside interconnecting frame parts of shelf sections 10b, 10c and 10d. For the example embodiment, no locking mechanisms are provided in the top shelf section 10a.

[0058] Inside an interconnecting frame part 50b-d, a pair of locking elements 42 configured to secure a corresponding pair of adjacent legs 20a-d is provided. The locking elements 42 are configured to be displaceable between unlocked positions at which a shelf section 10a-d may be displaceable in relation to an adjacent shelf section 10a-d, and locked positions at which the shelf section 10a-d is secured to the adjacent shelf section 10a-d, which will be discussed with reference to in Figs 4A-4C. The locking elements 42 are provided with stop portions 48 which are configured to stop the locking elements 42 from sliding through intermediate elements 44 in which the locking elements 42 are located. Inside the intermediate elements 44 the locking elements 42 are connected to a respective spring 45, which is biased towards the locked position of the locking elements 42.

[0059] Each intermediate element 44 is provided with a plurality of locking bearings 46, which facilitates the movement of the intermediate element 44 within the hollow interior of the interconnecting frame part 50b-d between the locked position and the unlocked position. A spool 53 is provided centrally within the interconnecting frame part 50b-d and mechanically coupled to an associated pair of locking elements 42 through the intermediate element 44 by a connecting element 48. The connecting element 48 is structured and arranged to be windable onto the spool 53 when the spool 53 is rotated and thereby forcing the intermediate elements 44 towards each other, whereby the intermediate element 44 s in turn brings the locking elements 42 with them so as to unlock the pair of adjacent legs 20a-d. The spool 53 is connected to a handle 54 which is provided on an outside of the interconnecting frame part 50b-d such that it is accessible for an operator of the telescopically extendable shelf system 1. As readily appreciated by the person skilled in the art, by manually rotating the handle 54, the spool will rotate with the handle and achieve the unlocking in the previously described manner.

[0060] The locking elements 42 present rounded, or tapered, heads 41 to allow them to slide smoothly along the common engagement portion 15ab, 15bc, 15cd while moving the shelf section 10a-d between the collapsed state and

the extended state.

[0061] Turning to Fig. 4A to Fig. 4C a sequence for unlocking the locking mechanism 40ab, 40bc, 40cd will be described. In Fig. 4A to Fig. 4C, only one of the locking mechanisms 40ab which is configured to lock two pairs of telescopically connected legs of shelf sections 10a and 10b is illustrated for clarity. In Fig. 4A the locking mechanism 40 ab is in a locked position, which is seen by that the locking elements 42 are pushed by the springs 45 through an overlapping opening 43 of the telescopically connected legs from the outside and into the inside of the common engagement portion 15ab. The common engagement portion 15ab is where the inwardly arranged leg 20a of the top shelf section 10a and the outwardly arranged leg 20b of shelf section 10b overlaps. In the locked position, the shelf section 10a is in the extended shelf state. To move the shelf section 10a from the extended shelf state to the collapsed shelf state, the spool 53 is rotated to release the biasing from the spring 45 and to pull the locking elements 42 out from the overlapping openings 43, which step can be seen in Fig. 4B. When the locking elements 42 are withdrawn from the overlapping openings 43, the inwardly arranged leg 20a will by the force of gravity slide into the outwardly arranged leg 20b. Hence, the size of the common engagement portion 15ab will increase. This sequence is illustrated in Fig. 4C. It may also be noted that the openings 43 are not overlapping anymore when the shelf section 10a is in the collapsed shelf state. As readily appreciated by the person skilled in the art, when the spool 53 is manoeuvred it will unlock both the locking elements 42 from each leg in the pair of legs connected to locking mechanism 40ab. Thereby both of the legs in the pair of legs can be manoeuvred simultaneously.

[0062] Turning to Fig. 5, a second embodiment of the locking mechanism 40' is illustrated. The locking mechanism 40' shares many features with locking mechanism 40, as indicated herein by like reference numbers representing like features in the drawings. Thus, the locking elements 42 are biased by the springs 45 and located inside intermediate elements 44 with bearings 46 and the locking mechanism 40' is arranged within the interconnecting frame part 50ab as in the first embodiment. However, instead of a spool 53, two levers 52 are used to operate the locking mechanism 40'. The levers 52 are attached to the intermediate elements 44 and thereby mechanically connected to the locking elements 42 through the intermediate elements 44. The levers 52 are arranged to be accessible from outside of the interconnecting frame part 50 so as to allow unlocking said pair of adjacent legs 20 by pushing said respective levers 52 toward each other. In some embodiments (not shown) there may be only one lever that is moved in one direction to unlock both of the locking elements 42.

[0063] Turning to Fig. 6, a third embodiment of the locking mechanism 40" is illustrated. The third embodiment is provided with locking elements 42" configured to protrude through overlapping openings 43 in a manner similar to the first and second embodiments. However, the locking mechanism 40" is configured to be located inside the common engagement portions 15ab, 15bc, 15cd of telescopically connected legs and the locking element 42" is configured to protrude through overlapping openings 43 provided in said telescopically connected legs from the inside and out to reach the locked positions. The locking mechanism 40" is V-shaped and flexible such that it pushes the locking element 42" toward the telescopically connected legs such that it is pushed towards the openings 43 and through the openings 43 when these overlaps. Thereby, a biased locking mechanism 40 is achieved.

[0064] Turning to Fig. 7, three telescopically extendable shelf systems 1 is illustrated in their collapsed state and stacked on each other. By fitting the locking portion 25 of the top shelf section 10a of a telescopically extendable shelf system 1 together with the hollow portion 24 of the base shelf section 10d of a further telescopically extendable shelf system 1, they may be stacked on each other. The hollow portion 24 and the locking portion 25 is further described in connection to Fig. 1B. The stacking of telescopically extendable shelf system 1 may be used both in their collapsed state and their extended state.

[0065] A locking arrangement 60 of the telescopically extendable shelf system 1 can be used to secure the telescopically extendable shelf system 1 to the further telescopically extendable shelf system 1. When for example, transporting a plurality of stacked telescopically extendable shelf systems 1 in a vehicle, bumps may cause the vehicle to rock. The locking arrangement 60 locks the two telescopically extendable shelf systems 1 together such that the telescopically extendable shelf systems 1 may not fall off from their stacked position. The locking arrangement 60 locks the two telescopically extendable shelf systems 1 together with a pin 62 that is inserted in, when stacked, two overlapping stack openings (not shown). In Fig. 7 the bottom telescopically extendable shelf system 1 is provided with a set of wheels 70. The set of wheels 70 may be structured and arranged such that they fit in the hollow portions 24 of the legs 20d of the base shelf section 10d (see Fig. 1B).

[0066] The person skilled in the art realizes that the present disclosure by no means is limited to the preferred embodiments described above. On the contrary, many modifications and variations are possible within the scope of the appended claims. Additionally, variations to the disclosed embodiments can be understood and effected by the skilled person in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims.

Claims

1. A telescopically extendable shelf system (1), comprising:

two or more shelf sections (10a-d) each having a plurality of legs (20a-d) which together support a shelf panel (13), wherein the plurality of legs (20a) of each shelf section (10a) is structured and arranged to slidably engage with a corresponding plurality of legs (20b) of an adjacent shelf section (10b) of the two or more shelf sections (10a-d) along respective common engagement portions (15ab, 15bc, 15cd) so as to form telescopic connections for allowing positioning said each shelf section (10a) in an extended state and a collapsed state, respectively, with respect to said adjacent shelf section (10b),
wherein at least two bearings (32, 34) are provided at each common engagement portion (15ab, 15bc, 15cd) for interconnecting telescopically connected legs,
wherein the at least two bearings (32, 34) comprises an inwardly protruding bearing (32) which is provided on an inner surface (24) of each leg of the plurality of legs (20a-d) of said each shelf section (10a-d), and an outwardly protruding bearing (34) which is provided on an outer surface (26) of a leg of the plurality of legs (20a-d) of said adjacent shelf section (10a-d), and
wherein locking mechanisms (40ab, 40bc, 40cd) are provided so as to secure telescopically connected legs with respect to each other at each common engagement portion (15ab, 15bc, 15cd) for allowing to secure said each shelf section (10a) to said adjacent shelf section (10b) in at least said extended state.

2. The telescopically extendable shelf system (1) according to any one of the preceding claims, wherein the two or more shelf sections (10a-d) comprise a top shelf section (10a) and a base shelf section (10d),

wherein each of the plurality of legs (20d) of the base shelf section (10d) has a respective foot portion (23) which presents a respective hollow portion (24),
wherein each of the plurality of legs (20a) of the top shelf section (10a) has a respective locking portion (25),
wherein the telescopically extendable shelf system (1) is structured and arranged such that locking portions (25) of the plurality of legs (20a) of the top shelf section (10a) can form a geometrically complementary engagement with associated hollow portions (24) of a plurality of legs (20d) of a base shelf section (10d) of a further telescopically extendable shelf system (1) so as to allow stacking the further telescopically extendable shelf system (1) on top of the telescopically extendable shelf system (1).

3. The telescopically extendable shelf system (1) according to claim 2 further comprising a locking arrangement (60) configured to secure the further telescopically extendable shelf system (1) to the telescopically extendable shelf system (1) when stacked.

4. The telescopically extendable shelf system (1) according to any one of the preceding claims, wherein the shelf panel (13) of at least one of the two or more shelf sections (10a-d) are connected to its plurality of legs (20a-d) at or close to free ends (29) thereof, which free ends (29) do not protrude into a plurality of legs (20a-d) on an adjacent shelf section (10a-d).

5. The telescopically extendable shelf system (1) according to any one of the preceding claims, wherein the locking mechanisms (40ab, 40bc, 40cd) comprise locking elements (42) arranged at each common engagement portion (15ab, 15bc, 15cd) and configured to be displaceable between unlocked positions at which said each shelf section (10a-d) is displaceable in relation to said adjacent shelf section (10a-d), and locked positions at which said each shelf section (10a-d) is secured to said adjacent shelf section (10a-d).

6. The telescopically extendable shelf system (1) according to claim 5, wherein the locking elements (42), in the unlocked positions, are arranged outside of the common engagement portions (15ab, 15bc, 15cd) of telescopically connected legs and configured to protrude through overlapping openings (43) provided in said telescopically connected legs from the outside and in to reach the locked positions.

7. The telescopically extendable shelf system (1) according to claim 5 or 6, wherein the locking elements (42) presents rounded, or tapered, heads (41).

8. The telescopically extendable shelf system (1) according to any one of claim 5 to 7, wherein pairs of locking elements (40) are provided inside interconnecting frame parts (50) of a shelf section (10a-d) which interconnecting frame parts (50) interconnects pairs of adjacent legs of its plurality of legs (20a-d), and wherein each locking element

(40ab, 40bc, 40cd) of a pair of locking elements is configured to secure a corresponding one of a pair of adjacent legs.

9. The telescopically extendable shelf system (1) according to claim 8, wherein each locking element (40ab, 40bc, 40cd) of a pair of locking elements is coupled to a respective lever (52) arranged to be accessible from outside of the interconnecting frame part (50b-d) so as to allow unlocking said pair of adjacent legs by pushing said respective levers (52) toward each other.

10. The telescopically extendable shelf system (1) according to claim 8, wherein each interconnecting frame part (50b-d) comprises a respective spool (53) which is mechanically coupled to an associated pair of locking elements (40ab, 40bc, 40cd) and arranged to be rotatable from outside of the interconnecting frame part (50b-d) so as to allow unlocking a pair of adjacent legs by rotating the spool (53).

11. The telescopically extendable shelf system (1) according to any one of claims 8 to 10, wherein each locking element (42) of a pair of locking elements is supported in relation to their associated interconnecting frame part (50b-d) by means of at least one bearing (44).

12. The telescopically extendable shelf system (1) according to claim 6, wherein the locking elements (42), in the unlocked positions, are arranged inside the common engagement portions of telescopically connected legs and configured to protrude through overlapping openings (43) provided in said telescopically connected legs from the inside and out to reach the locked positions.

13. The telescopically extendable shelf system (1) according to any one of claims 5 to 12, wherein the locking elements (42) are spring-biased towards their locked positions.

14. The telescopically extendable shelf system (1) according to any one of the preceding claims further comprising, for each common engagement portion, a seal (80) arranged adjacent to the common engagement portion and in attachment with a telescopically connected leg associated therewith, said seal (80) being configured to seal the common engagement portion from the ambient environment.

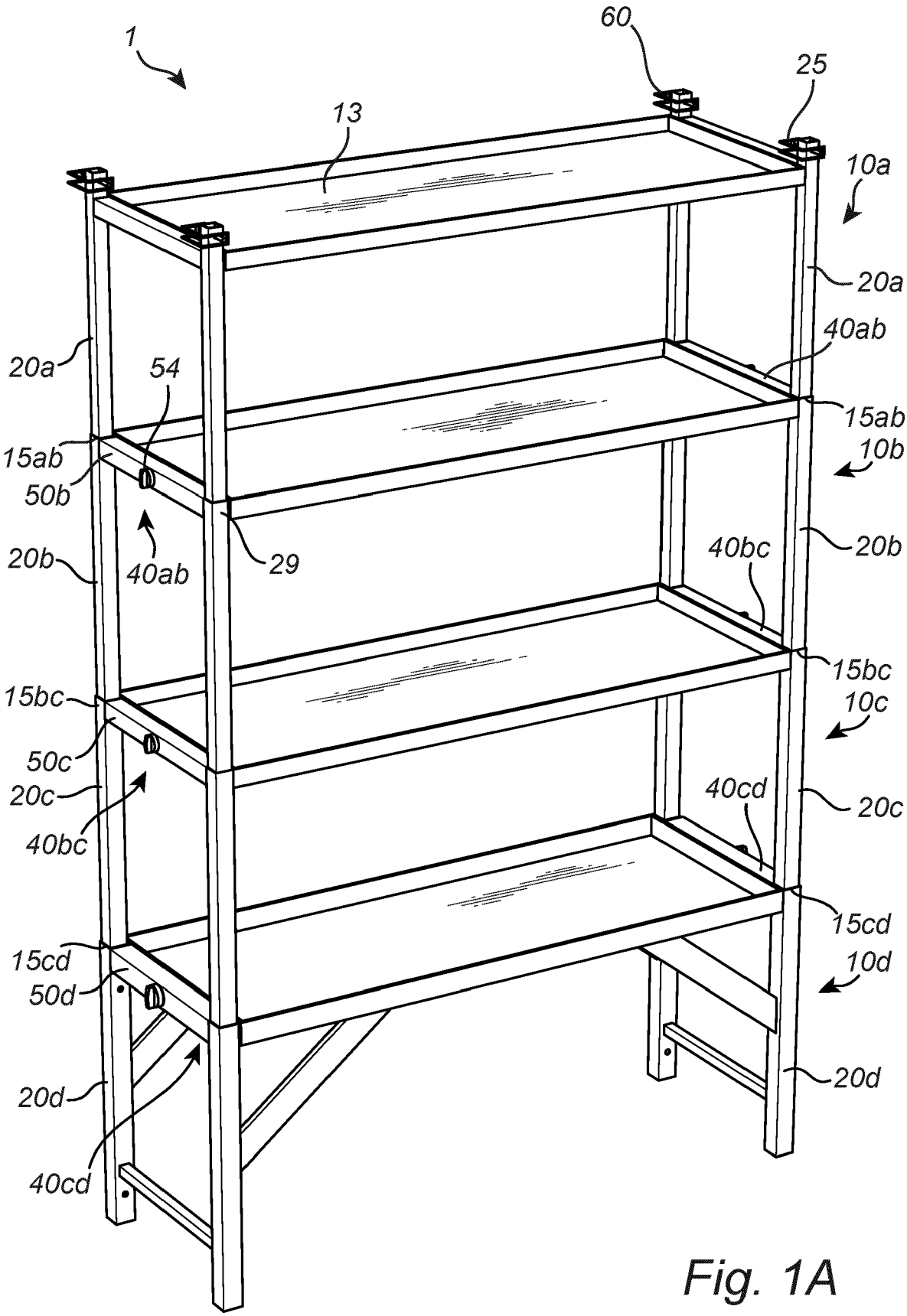

1
60
25
13
10a
20a
40ab
20a
54
15ab
10b
15ab
50b
40ab
29
20b
40bc
20b
15bc
10c
15bc
50c
20c
40cd
20c
40bc
15cd
10d
15cd
50d
20d
20d
40cd

Fig. 1A

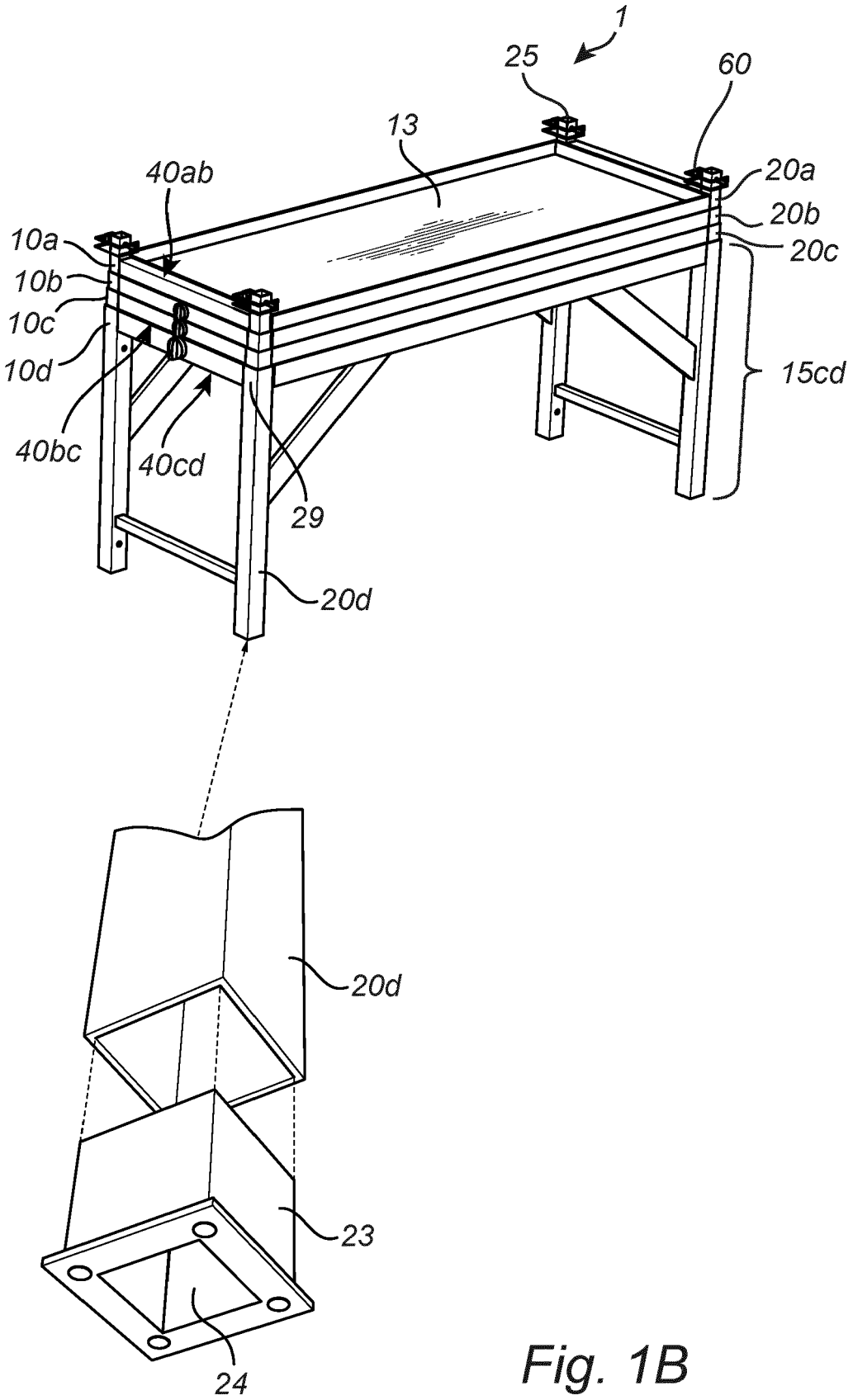

1
25
60
13
40ab
20a
20b
20c
10a
10b
10c
10d
15cd
40bc
40cd
29
20d
20d
23
24

Fig. 1B

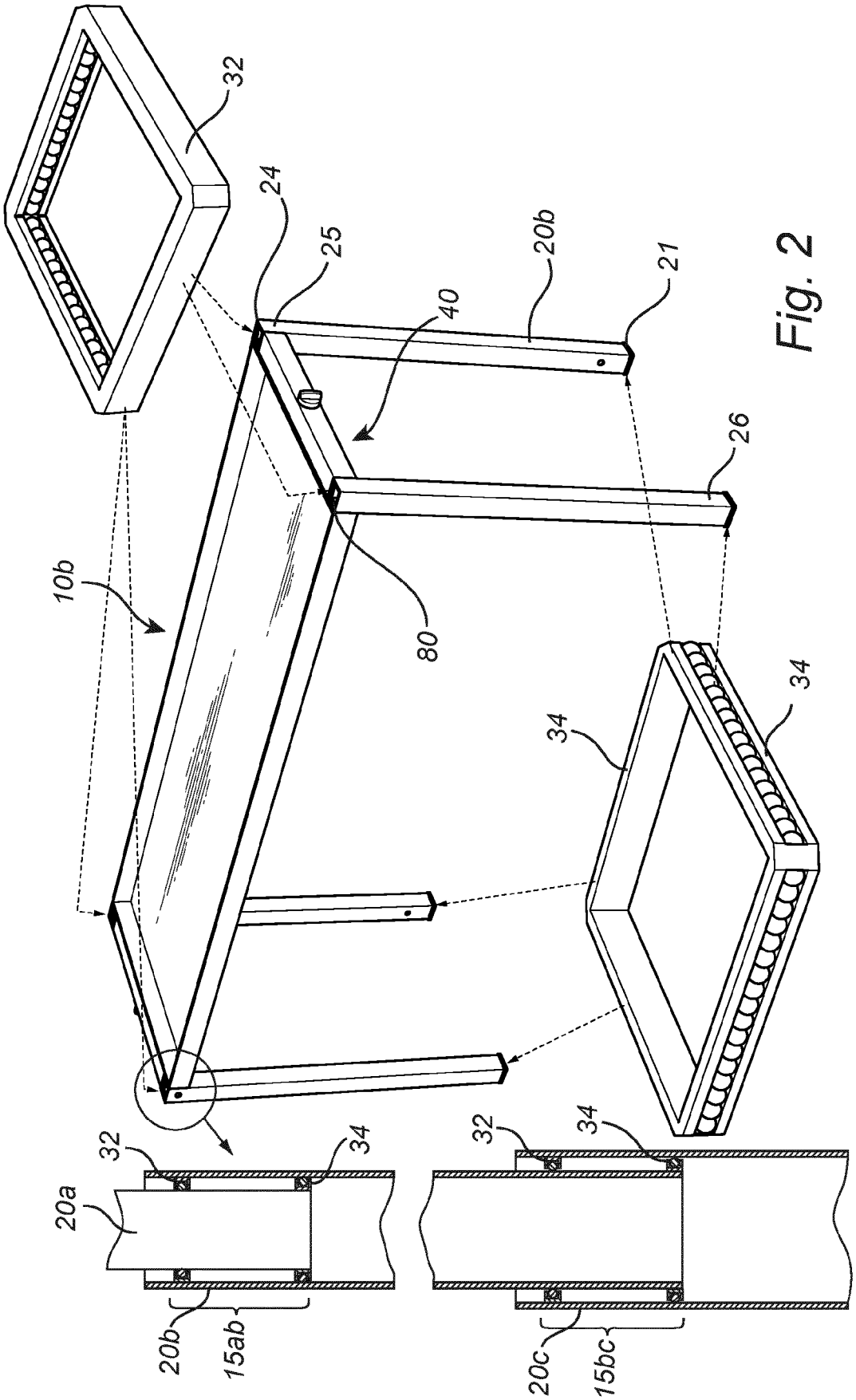


Fig. 2

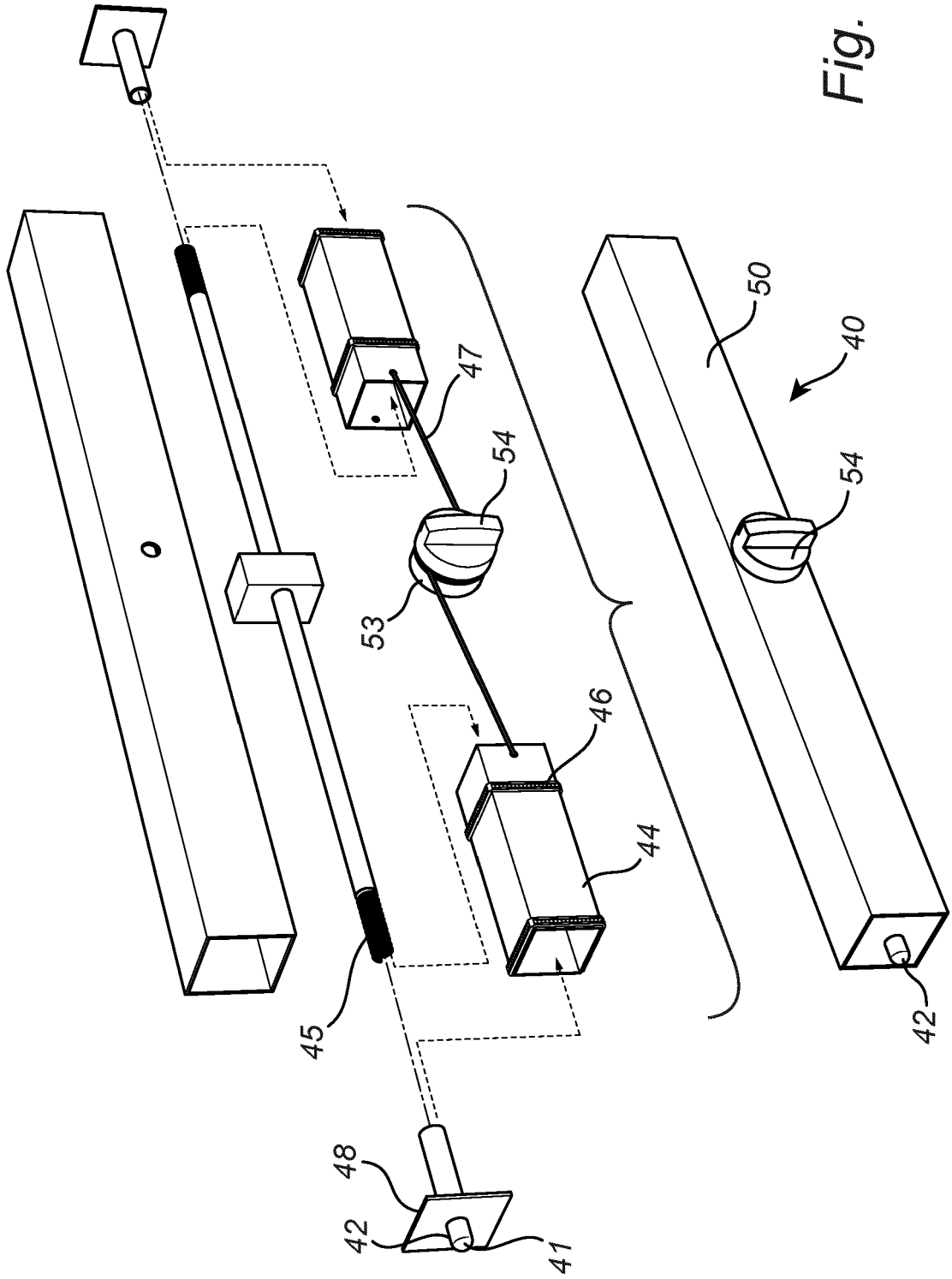


Fig. 3

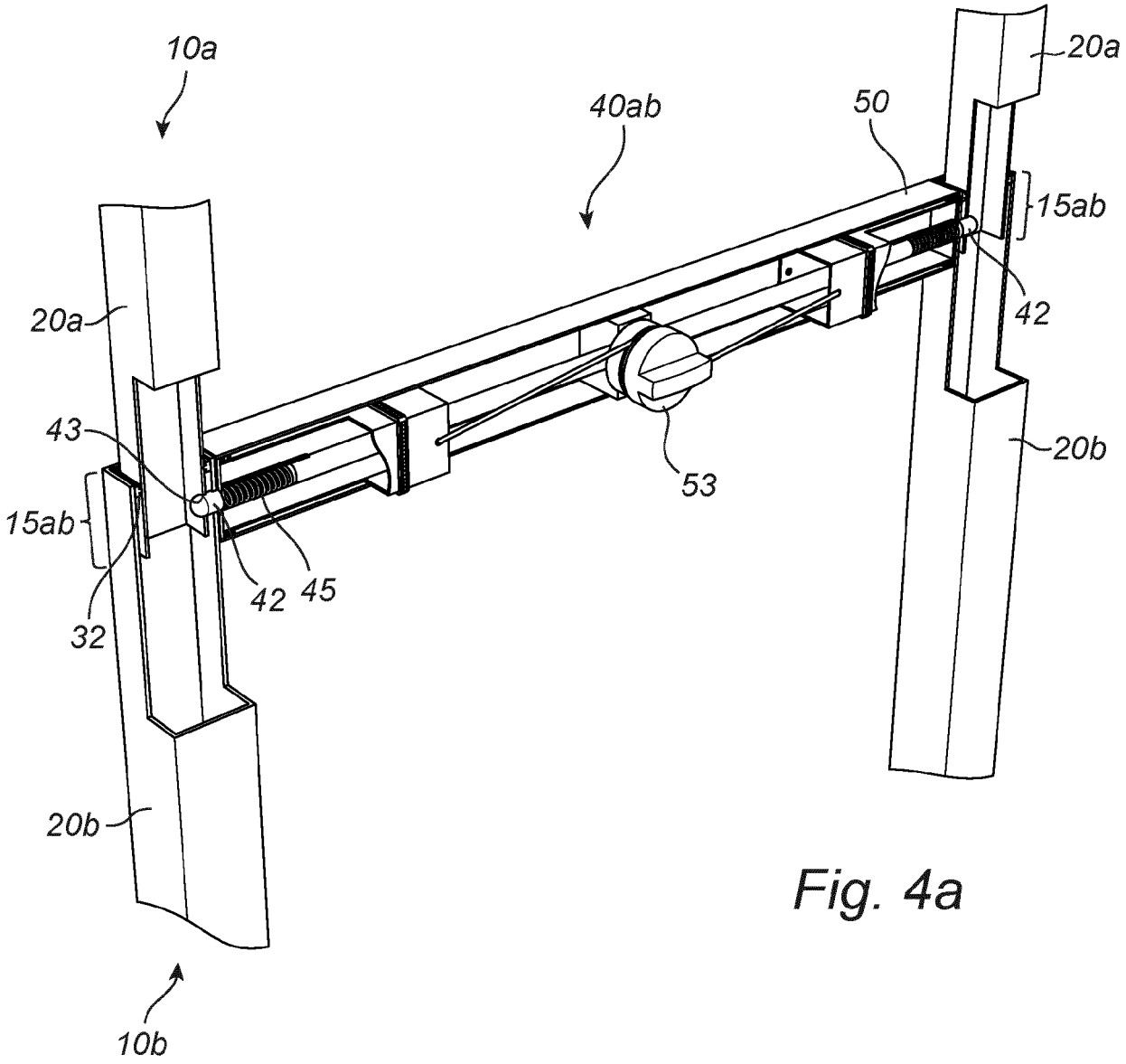


Fig. 4a

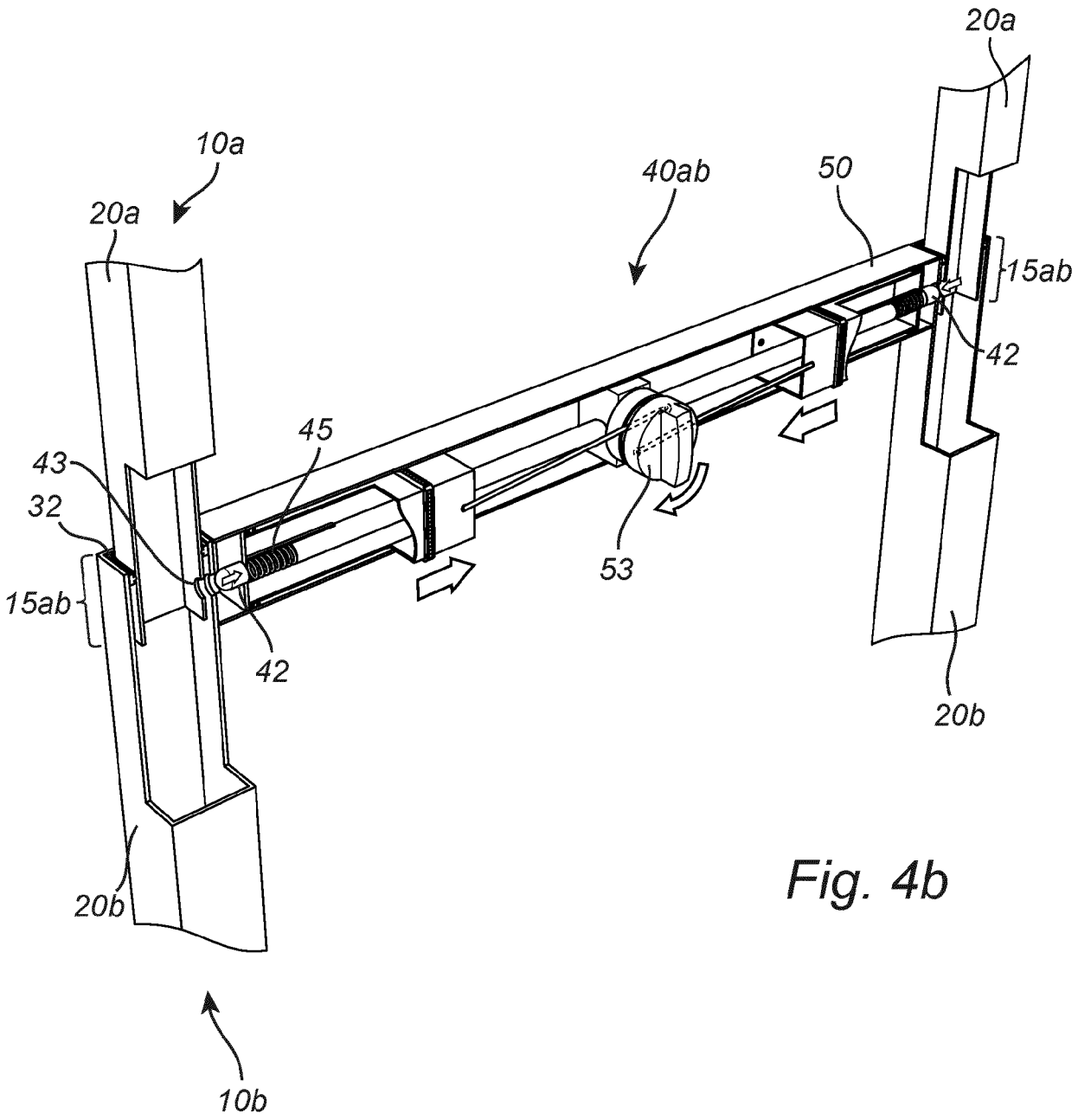


Fig. 4b

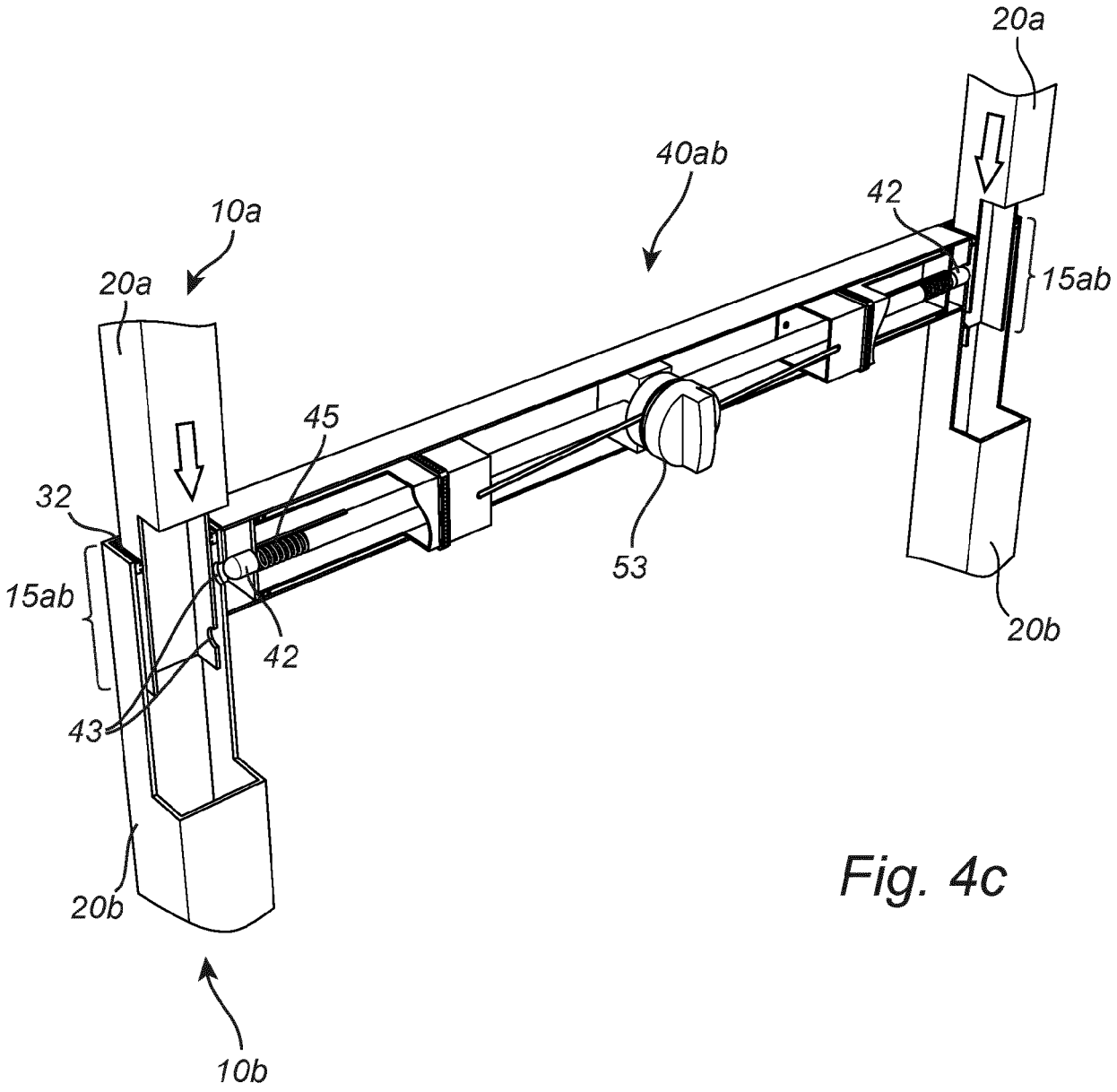


Fig. 4c

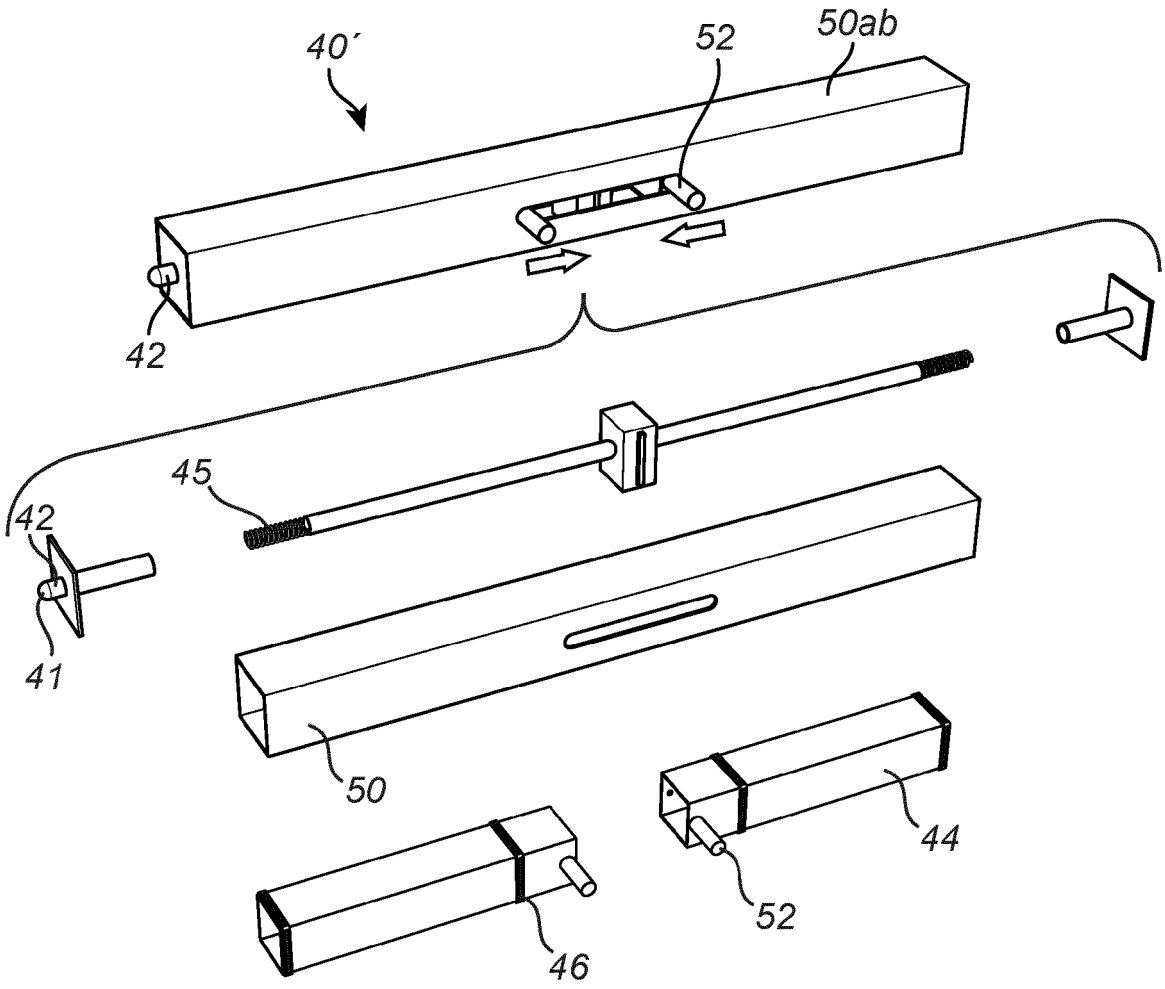


Fig. 5

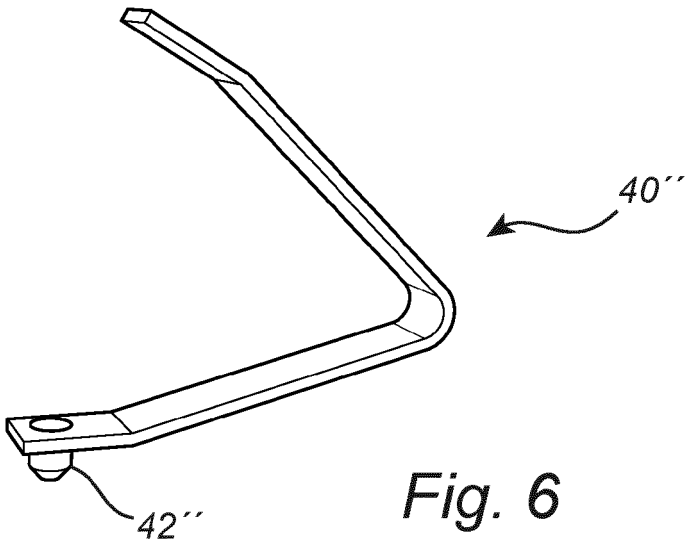


Fig. 6

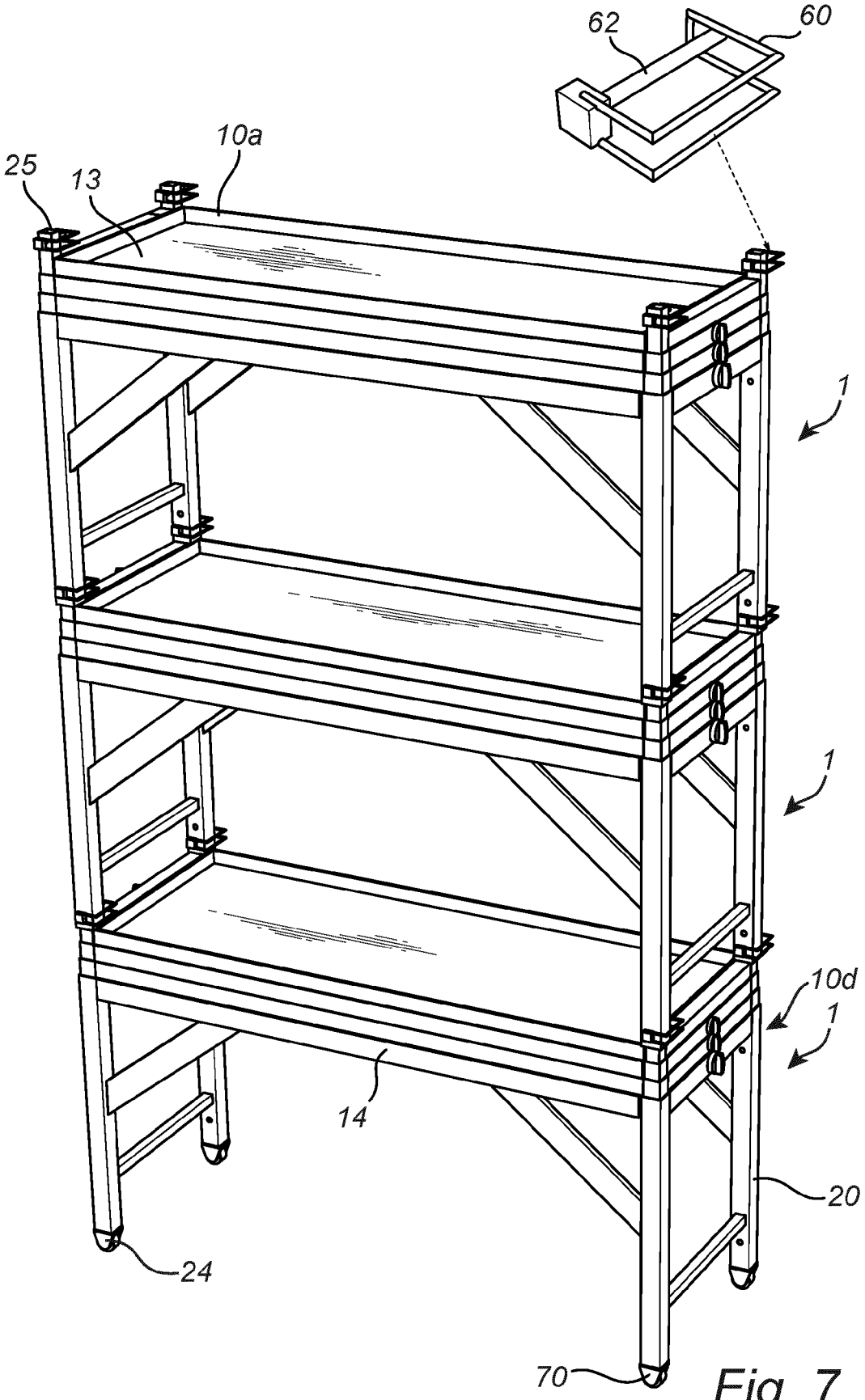


Fig. 7

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 16 9026

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 2013/055604 A1 (HERMAN BARAN BERNARDO [MX] ET AL) 7 March 2013 (2013-03-07) * figures 10,11A,11B,12,12A,14 *	1-14	INV. A47B45/00 B25H3/02
Y	US 10 352 344 B2 (XLOCKTECH PTY LTD [AU]) 16 July 2019 (2019-07-16) * column 1, lines 40-42; figure 6D *	1	
Y A	US 10 092 099 B1 (LINARI RONALD [US] ET AL) 9 October 2018 (2018-10-09) * column 4, lines 44-52; figures 16,19,20 *	12 2	
Y	US 2017/369087 A1 (DYSON MICHAEL [US]) 28 December 2017 (2017-12-28) * paragraph [0022]; figures 1,2A *	2,3	
Y A	GB 2 233 022 A (MIN LIAW SHOW) 2 January 1991 (1991-01-02) * page 6, lines 1-4; figure 6 *	4-8,11, 13 1	
Y	US 5 738 186 A (JONES RONALD BARRY THOMAS [GB]) 14 April 1998 (1998-04-14) * figure 6 *	5-9,13	TECHNICAL FIELDS SEARCHED (IPC) A47B B25H
Y	GB 2 305 956 A (KUO GARY [TW]) 23 April 1997 (1997-04-23) * figures 5B,6A,7 *	10	
Y	GB 2 436 584 A (NORMAN WILLIAM LIEFKE [CA]; KUO CHING-YAO [TW]) 3 October 2007 (2007-10-03) * lines 9,10, paragraph 9; figure 4 *	14	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 September 2024	Matzdorf, Udo

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 16 9026

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

24-09-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2013055604 A1	07-03-2013	US 2013055604 A1	07-03-2013
		WO 2011104623 A1	01-09-2011
US 10352344 B2	16-07-2019	AU 2016222282 A1	31-08-2017
		CN 107835904 A	23-03-2018
		EP 3259482 A1	27-12-2017
		US 2018031018 A1	01-02-2018
		WO 2016131102 A1	25-08-2016
US 10092099 B1	09-10-2018	NONE	
US 2017369087 A1	28-12-2017	NONE	
GB 2233022 A	02-01-1991	BE 1004040 A6	15-09-1992
		GB 2233022 A	02-01-1991
		US 4989692 A	05-02-1991
US 5738186 A	14-04-1998	AU 1817995 A	18-09-1995
		DE 69502590 T2	07-01-1999
		EP 0746663 A1	11-12-1996
		US 5738186 A	14-04-1998
		WO 9523907 A1	08-09-1995
GB 2305956 A	23-04-1997	GB 2305955 A	23-04-1997
		GB 2305956 A	23-04-1997
GB 2436584 A	03-10-2007	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82