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(54) SUITCASE

(57) A suitcase (10, 110) is disclosed as including a main body (12, 112) with a plurality of walls (14a, 14b, 14c, 114a, 114b, 114c) joined with each other and defining an internal space (16, 116), a first opening (18), and a second opening (20) opposite to the first opening, a first cover (32) pivotally movable relative to the main body between an opened position in which access to the internal space of the main body *via* the first opening is allowed and a closed position in which access to the internal space of the body member *via* the first opening is prevented, and a second cover (24) pivotally movable relative to the main body between an opened position in which access to the internal space of the main body *via* the second opening is allowed and a closed position in which access to the internal space of the main body *via* the second opening is prevented, both the first cover and the second cover being lockable by a Transportation Security Administration (TSA) lock (41) against movement from their respective closed position to their respective opened position, and the TSA lock being operable to simultaneously unlock both the first cover member and the second cover member to allow the first cover member and the second cover member to move from their respective closed position to their respective opened position.

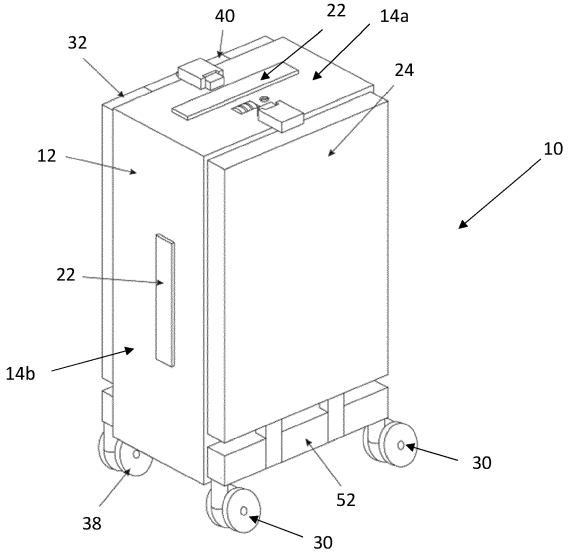

Figure 1

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Description

[0001] This invention relates to a suitcase and, in particular, a suitcase with at least one cover pivotally movable relative to a main body about a hinge assembly.

[0002] There are a large number of suitcases in the market, catering for various needs of travellers. It is however noted that the existing suitcases still suffer from a number of shortcomings. For example, in existing suitcases, the cover is usually connected with the body *via* one or more zippers. This makes it difficult to replace the cover when, for example, the cover is damaged or when the user would like to change to a cover with other features, e.g., of a different graphics design. In addition, conventional suitcases usually only have one cover which may be opened to allow access to the major storage space in the suitcases. This is inconvenient, in particular when the user needs to locate objects placed at the back of major storage space in the suitcase. Furthermore, due to the current suitcase design, it is necessary to produce either the whole body shell or produce a number of differently sized and configured parts to form the body shell, which makes production costly and/or complicated.

[0003] It is thus an object of the present invention to provide a suitcase in which at least one of the aforesaid shortcomings are mitigated or at least to provide a useful alternative to the trade and public.

[0004] According to the present invention, there is provided a suitcase including a body member with a plurality of wall members joined with each other and defining an internal space, a first opening, and a second opening opposite to said first opening, a first cover member pivotally movable relative to said body member between an opened position in which access to said internal space of said body member *via* said first opening is allowed and a closed position in which access to said internal space of said body member *via* said first opening is prevented, and a second cover member pivotally movable relative to said body member between an opened position in which access to said internal space of said body member *via* said second opening is allowed and a closed position in which access to said internal space of said body member *via* said second opening is prevented, wherein both said first cover member and said second cover member are lockable by a Transportation Security Administration (TSA) lock against movement from their respective closed position to their respective opened position, and wherein said TSA lock is operable to simultaneously unlock both said first cover member and said second cover member to allow said first cover member and said second cover member to move from their respective closed position to their respective opened position.

[0005] Suitcases according to embodiments of the present invention will now be described, by way of examples only, with reference to the accompanying drawings, in which:

Figure 1 is a front perspective view of a suitcase according to a first embodiment of the present invention in a front cover closed configuration;

Figure 2 is a front perspective view of the suitcase of Figure 1 in a front cover opened configuration;

Figure 3 is a rear perspective view of the suitcase of Figure 1 in a rear cover closed configuration;

Figure 4 is a rear perspective view of the suitcase of Figure 1 in a rear cover opened configuration;

Figure 5 is a perspective exploded view of the suitcase of Figure 1, with the front cover and rear cover removed for clarity purposes;

Figure 6 is a perspective view of the hinged connection between the front cover and a front wheel caster housing according to a first design of the suitcase of Figure 1;

Figure 7 is a perspective view of the hinged connection between the front cover and a front wheel caster housing according to a further design of the suitcase of Figure 1;

Figure 8 shows a schematic view of the hinged connection between the front cover and a front wheel caster housing according to a yet further design of the suitcase of Figure 1;

Figure 9 shows a schematic view of the hinged connection between the front cover and a front wheel caster housing according to an additional design of the suitcase of Figure 1;

Figure 10 is a rear perspective view of a suitcase according to a second embodiment of the present invention in a rear cover closed configuration;

Figure 11 is a rear perspective view of the suitcase of Figure 10 in a rear cover opened configuration;

Figure 12 is a perspective view of the hinge connection between the front cover and the main body of the suitcase of Figure 10;

Figure 13 is a perspective view of another hinge connection between the front cover and the main body of the suitcase of Figure 10;

Figure 14 is a perspective view of the hinge assembly of the suitcase of Figure 10 in a hingeclosed configuration;

Figure 15 is a perspective view of the hinge assembly of Figure 14 in a hinge-opened configuration;

Figure 16 shows a schematic view of the hinged connection between the front cover and the main body according to a design of the suitcase of Figure 10;

Figure 17 shows a schematic view of the hinged connection between the front cover and the main body according to another design of the suitcase of Figure 10;

Figure 18 is an exploded perspective view of the main body of the suitcase of Figure 1; and

Figures 19 to 22 are various perspective views of half-body parts of the main body of the suitcase of Figure 1.

[0006] A suitcase according to a first embodiment of the present invention is shown in Figures 1 to 4, and

generally designated as 10.

[0007] As shown in Figures 1 and 2, the suitcase 10 has a main body 12 with an upper wall 14a, two side walls 14b and a lower wall 14c, joined with one another and defining an internal space 16. The main body 12 has a front opening 18 and a rear opening 20 which is opposite to the front opening 18. Handles 22 are provided on the upper wall 14a and one (or both) of the side walls 14b.

[0008] As shown in Figure 2, a front cover 24 is pivotally movable relative to the main body 12 about a front hinge 26 of a front wheel caster housing 52. A pair of front wheel casters 30 are connected to the front wheel caster housing 52. It can be seen that the front cover 24 is pivotally movable relative to the main body 12 about an axis P_1-P_1 which lies on a plane parallel with the lower wall 14c. When the front cover 24 is in the closed position as shown in Figure 1, access to the internal space 16 through the front opening 18 is prevented, whereas when the front cover 24 is in the opened position as shown in Figure 2, access to the internal space 16 through the front opening 18 is allowed. Along inner edges 31 of the front cover 24 which abut the main body 12 of the suitcase 10 when the front cover 24 is in its closed position is provided with an endless rubber edging or a plurality of rubber edgings, for better sealing of the interface between the main body 12 and the front cover 24.

[0009] As shown in Figure 1, when the suitcase 10 is in its upright orientation (in the sense that the upper wall 14a faces upward and the two side walls 14b face sideward, and front wheel casters 30 and rear wheel casters 38 (as shown in Figures 3 and 4) support the suitcase 10 on a lower surface, such as a floor) and the front cover 24 is in its closed position, the front wheel casters 30 and the front wheel caster housing 52 are beneath the front cover 24.

[0010] Turning to Figures 3 and 4, the suitcase 10 also has a rear cover 32 which is pivotally movable relative to the main body 12 about a rear hinge 34 of a rear wheel caster housing 48. The pair of rear wheel casters 38 are connected to the rear wheel caster housing 48. The rear cover 32 is pivotally movable relative to the main body 12 about an axis P_2-P_2, which lies on a plane parallel with the lower wall 14c and with the axis P_1-P_1 about which the front cover 24 is pivotally movable relative to the main body 12. When the rear cover 32 is in the closed position as shown in Figure 3, access to the internal space 16 through the rear opening 20 is prevented, whereas when the rear cover 32 is in the opened position as shown in Figure 4, access to the internal space 16 through the rear opening 20 is allowed. Along inner edges 39 of the rear cover 32 which abut the main body 12 of the suitcase 10 when the rear cover 32 is in its closed position is provided with an endless rubber edging or a plurality of rubber edgings, for better sealing of the interface between the main body 12 and the rear cover 32. It is envisgaed that it is possible to remove the front cover 24 together with the front hinge 26 (and to remove the rear cover 32 together with the rear hinge 34) from the main body 12 by unscrewing several screws, and new front and/or rear cover be replaced and fixed onto the main body 12 by screws, thus facilitating customer service and cutomization of the suitcase 10

[0011] As shown in Figure 3, when the suitcase 10 is in its upright orientation and the rear cover 32 is in its closed position, the rear wheel casters 38 and the rear wheel caster housing 48 are beneath the rear cover 32. As noted above, in the present invention, when the suitcase 10 is in its upright orientation and the front cover 24 and the rear cover 32 are in their closed positions, the front wheel casters 30 and the front wheel caster housing 52 are beneath the front cover 24 and the rear wheel casters 38 and the rear wheel caster housing 48 are beneath the rear cover 32. This creates more storage space inside the suitcase 10 as the front wheel caster housing 52 and rear wheel caster housing 48 occupy space traditionally left for opening the zipper.

[0012] The rear cover 32 also includes a telescopic handle 40 which is movable simultaneously with the rear cover 32. When the telescopic handle 40 is extended, it may be held by a user for moving the suitcase 10. Firstly, the telescopic handle 40 may be secured to the rear cover 32 by a number of screws, thus allowing easy replacement of the telescopic handle 40. Secondly, the present construction creates a more aesthetically clean appearance, improve space utilization, enables the openings 18, 20 to be made larger, and makes installation of trimmings easier, thus improving manufacturing productivity.

[0013] A Transportation Security Administration (TSA) lock 41 and a set of combination lock dials 42 are provided on the upper wall 14a of the main body 12 of the suitcase 10. When both the front cover 24 and the rear cover 32 are in their respective closed positions, the combination lock dials 42 are operable to lock the front cover 24 and the rear cover 32 against pivotal movement relative to the main body 12 of the suitcase 10. In particular, after an opening code, e.g., "111", has been set for the combination lock dials 42, when the front cover 24 and the rear cover 32 are in their respective closed positions, if the combination lock dials 42 present any number other than the opening code, both a front latch lock 44 and a rear latch lock 46 are locked, which means that the front latch lock 44 cannot be opened to allow the front cover 24 to pivotally move relative to the main body 12 to its opened position and the rear latch lock 46 cannot be opened to allow the rear cover 32 to pivotally move relative to the main body 12 to its opened position. While the front latch lock 44 and the rear latch lock 46 are here referred to and shown as latch type catches, other kinds of suitable catches (such as clip-type catches) may also be used.

[0014] When the combination lock dials 42 are operated to present the opening code, both the front latch lock 44 and the rear latch lock 46 are simultaneously unlocked, whereupon the front latch lock 44 may be opened to allow the front cover 24 to pivotally move relative to the main body 12 to its opened position, and the

rear latch lock 46 may be opened to allow the front cover 32 to pivotally move relative to the main body 12 to its opened position. The TSA lock 41 is operable to simultaneously lock and unlock both the front latch lock 44 and the rear latch lock 46.

[0015] Turning to Figure 5, the pair of rear wheel casters 38 are attached to the rear wheel caster housing 48. The rear wheel caster housing 48, a rear connector 36, the main body 12 and a rear connection plate 50 (which is in the internal space 16 of the main body 12) are secured with one another by, e.g., a number of screws or rivets (not shown). Referring to Figures 3 and 4, it can be seen that the rear connector 36, the rear wheel caster housing 48 and the rear wheel casters 38 are beneath the rear cover 32 when the rear cover 32 is in its closed position. The rear wheel caster housing 48 includes the rear hinge 34 about which the rear cover 32 is pivotally movable relative to the main body 12 about the axis P_2-P_2.

[0016] Similarly, as shown in Figure 5, the pair of front wheel casters 30 are attached to a front wheel caster housing 52. The front wheel caster housing 52, a front connector 28, the main body 12 and a front connection plate 54 (which is in the internal space 16 of the main body 12) are secured with one another by, e.g., a number of screws or rivets (not shown). Referring to Figures 1 and 2, it can be seen that the front connector 28, the front wheel caster housing 52 and the front wheel casters 30 are beneath the front cover 24 when the front cover 24 is in its closed position. The front wheel caster housing 52 includes the front hinge 26 about which the front cover 24 is pivotally movable relative to the main body 12 about the axis P_1-P_1. Both the front connector 28 and the rear connector 36 are angular sections, so that while their weight can be kept low, they would still be effective in abosorbing vertical, lateral and rotational loads generated from the front wheel casters 30 and rear wheel casters 38 or impact loads directly placed on the front wheel caster housing 52 and the rear wheel caster housing 48.

[0017] Figure 6 shows the arrangement of the hinge connection between the front cover 24 with a first design of the front wheel caster housing, designated as 52a. The front wheel caster housing 52a, which is of a multiple-piece construction, includes a central connecting unit 56 and two front wheel caster connectors 58 attached to either side of the front wheel caster housing 52a. Each of the front wheel caster connectors 58 has an opening 60 with which one of the front wheel casters 30 may be attached for simultaneous movement.

[0018] The front cover 24 has a tongue 62 received between the two front wheel caster connectors 58. In one possible construction, the tongue 62 has two pins (not shown) extending sideway away from each other and received within a channel (not shown) of each of the two front wheel caster connectors 58, thus forming a hinge assembly about which the front cover 24 is pivotally movable relative to the front wheel caster housing 52a, and thus relative to the main body 12 with which the front wheel caster housing 52a is fixedly engaged. In an alternative construction, the tongue 62 of the front cover 24 has two channels (not shown) (or alternatively one channel which runs through its width) and each of the two front wheel caster connectors 58 has a pin (not shown) extending toward each other and received within the channel(s) of the tongue 62, thus also forming a hinge assembly about which the front cover 24 is pivotally movable relative to the front wheel caster housing 52a, and thus relative to the main body 12 with which the front wheel caster housing 52a is fixedly engaged. In a yet further alternative construction, the tongue 62 of the front cover 24 has a channel (not shown) which runs through its width, and each of the two front wheel caster connectors 58 also has a channel (not shown). When duly assembled, the channel of the front cover 24 is aligned with the channels of the front wheel caster connectors 58. One or more pins may be inserted through the channel(s) formed by the channel of the front cover 24 and the channels of the two front wheel caster connectors 58 to form a hinge assembly.

[0019] Figure 7 shows an arrangement of the hinge connection between the front cover 24 with a second design of the front wheel caster housing, designated as 52b, which is of a one-piece construction. The front wheel caster housing 52b also has two openings 60 with which the front wheel casters 30 may be attached for simultaneous movement. The two possible designs of hinge connection between the tongue 62 of the front cover 24 and the front wheel caster housing 52b are as discussed above.

[0020] Figure 8 shows a further hinge construction between the front cover 24 and the front wheel caster housing 52 (covering both the two designs of front wheel caster housings 52a, 52b), which allows the front cover 24 to pivotally move relative to the front wheel caster housing 52 between its opened position (shown in solid line) and closed position (shown in dotted lines). Figure 9 shows a yet further hinge construction between the front cover 24 and the front wheel caster housing 52 (covering both the two designs of front wheel caster housings 52a, 52b), which allows the front cover 24 to pivotally move relative to the front wheel caster housing 52 between its opened position (shown in solid line) and closed position (shown in dotted lines). The main difference between the two hinge constructions as shown in Figure 8 and Figure 9 is the positioning of the pin 64, which forms the pivoting axis between the front cover 24 and the front wheel caster housing 52 (and thus the pivoting axis between the front cover 24 and the main body 12).

[0021] It should be understood that the arrangements of hinge connection between the front cover 24 and the front wheel caster housing 52, 52a, 52b discussed above may also be used for connecting the rear cover 32 and the rear wheel caster housing 48.

[0022] Figures 10 and 11 show two rear perspective views of a suitcase according to a second embodiment of the present invention, generally designated as 110.

The suitcase 110 is of a similar construction with the suitcase 10. For example, the suitcase 110 has a main body 112 including an upper wall 114a, two side walls 114b and a lower wall 114c (the upper wall 114a, side walls 114b and lower wall 114c defining an internal space 116), a front cover 124, a rear cover 132, front wheel casters 130, rear wheel casters 138, a telescopic handle 140 movable simultaneously with the rear cover 132, a TSA lock 141, combination lock dials 142, a front latch lock 144, a rear latch lock 146, a rear wheel caster housing 148, and a front wheel caster housing 152 (see Figures 12 and 13).

[0023] The rear cover 132 is pivotally movable relative the main body 112 about a pair of rear side hinges 166 on one of the side walls 114b of the main body 112, about an axis P_3-P_3. It can be seen that the axis P_3-P_3 is perpendicular to the axis P_2-P_2.

[0024] Though not expressly shown in the drawings, the front cover 124 of the suitcase 110 is pivotally movable relative to the main body 112 about a pair of hinges on one of the side walls 114b of the main body 112, about an axis which is parallel to the axis P_3-P_3.

[0025] A rear side latch lock 168 and a front side latch lock 170 are provided on one of the side walls 114b. When the rear cover 132 is in its closed position, the rear side latch lock 168 locks the rear cover 132 against pivotal movement relative to the main body 112 to its open position. A user may unlock the rear side latch 168 to allow the rear cover 132 to be pivoted relative to the main body 112 to its open position. Similarly, when the front cover 124 is in its closed position, the front side latch lock 170 locks the front cover 124 against pivotal movement relative to the main body 112 to its open position. A user may unlock the front side latch 170 to allow the front cover 124 to be pivoted relative to the main body 112 to its open position. While the rear side latch lock 168 and the front side latch lock 170 are here referred to and shown as latch type catches, other kinds of suitable catches (such as clip-type catches) may also be used.

[0026] Figure 12 shows a front side hinge 172 connecting the front cover 124 and the main body 112 of the suitcase 110, to which a front wheel caster housing 152 is fixedly engaged. The front side hinge 172 includes a male member 174 and a female member 176 mated with each other for allowing the front cover 124 to be pivotally movable relative to the main body 112 about the front side hinge 172. As shown in Figure 13, the front side hinge 172 may be provided along another side of the main body 112 and front cover 124. Figure 14 shows the front side hinge 172 in a closed configuration, and Figure 15 shows the front side hinge 172 in an opened configuration.

[0027] Figure 16 shows a further construction of the front hinge assembly 172 between the front cover 124 and the main body 112, which allows the front cover 124 to pivotally move relative to the main body 112 between its opened position (shown in solid line) and closed position (shown in dotted lines). Figure 17 shows a yet further construction of the front hinge assembly 172 between the front cover 124 and the main body 112, which allows the front cover 124 to pivotally move relative to the main body 112 between its opened position (shown in solid line) and closed position (shown in dotted lines). The main difference between the two constructions as shown in Figure 16 and Figure 17 is the positioning of a pin(s) 178 connecting the male body 174 and the female body 176 of the hinge assembly 172, which forms the pivoting axis between the front cover 124 and to the main body 112.

[0028] As shown in Figure 18, the main body 12 of the suitcase 10 is formed of two identical half-body parts 72 joined with each other *via* a metal or plastic frame 74 (such as an endless frame) between the two half-body parts 72. Figures 19 to 22 show various perspective views of the two half-body parts 72. One major advantage of this arrangement is that only one mould need be made, which would reduce both mould cost and development time.

[0029] It is envisaged that the suitcase 110 is also similarly structured, in that its main body 112 is also formed of two identical half-body parts joined with each other *via* a metal or plastic frame (such as an endless frame) between the two half-body parts.

[0030] In the case of the suitcase 10, when the suitcase 10 is in its upright orientation, each of the both front cover 24 and the rear cover 32 is pivotally movable relative to the main body 12 about a respective generally horizontal axis. As for the suitcase 110, when the suitcase 110 is in its upright orientation, each of the front cover 124 and the rear cover 132 is pivotally movable relative to the main body 112 about respectively a generally vertical axis. It is envisaged that a suitcase according to the present invention may be such that, when the suitcase is in its upright orientation, one of the front cover and rear cover is pivotally movable relative to the main body about a hinge assembly about a generally horizontal axis and the other of the front cover and rear cover is pivotally movable relative to the main body about a hinge assembly about a generally vertical axis.

[0031] It should be understood that the above only illustrates examples whereby the present invention may be carried out, and that various modifications and/or alterations may be made thereto without departing from the spirit of the invention.

[0032] It should also be understood that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment, may also be provided or separately or in any suitable subcombination.

Claims

1. A suitcase including:

   a body member with

   a plurality of wall members joined with each other and defining an internal space,
   a first opening, and
   a second opening opposite to said first opening,

   a first cover member pivotally movable relative to said body member between an opened position in which access to said internal space of said body member *via* said first opening is allowed and a closed position in which access to said internal space of said body member *via* said first opening is prevented, and
   a second cover member pivotally movable relative to said body member between an opened position in which access to said internal space of said body member *via* said second opening is allowed and a closed position in which access to said internal space of said body member *via* said second opening is prevented,
   wherein both said first cover member and said second cover member are lockable by a Transportation Security Administration (TSA) lock against movement from their respective closed position to their respective opened position, and
   wherein said TSA lock is operable to simultaneously unlock both said first cover member and said second cover member to allow said first cover member and said second cover member to move from their respective closed position to their respective opened position.

2. The suitcase of Claim 1, further including a second lock member operable to simultaneously control operation of a first catch member and a second catch member,

   wherein said first catch member is operable to allow or prevent relative pivotal movement between said first cover member and said body member, and
   wherein said second catch member is operable to allow or prevent relative pivotal movement between said second cover member and said body member.

3. The suitcase of any of the preceding claims, wherein said first cover member includes a handle member for simultaneous movement.

4. The suitcase of Claim 3, wherein said handle member is a telescopic handle member.

5. The suitcase of any of the preceding claims, wherein said body member includes two substantially identical half-body parts.

6. The suitcase of Claim 5, wherein said half-body parts are joined with each other *via* a frame between said half-body parts.

7. The suitcase of any of the preceding claims, further including at least a first wheel connected with said body member *via* a first connecting member.

8. The suitcase of Claim 7, wherein said first connecting member includes a first hinge assembly about which said first cover member is pivotally movable relative to said body member.

9. The suitcase of Claim 7 or 8, further including a second wheel connected with said body member *via* a second connecting member.

10. The suitcase of Claim 9, wherein said second connecting member includes a second hinge assembly about which said second cover member is pivotally movable relative to said body member.

11. The suitcase of any one of Claims 7 to 10, wherein when said suitcase is in an upright orientation and said first cover member is in its closed position, said first wheel is beneath said first cover member.

12. The suitcase of Claim 11, wherein when said suitcase is in said upright orientation and said second cover member is in its closed position, said second wheel is beneath said second cover member.

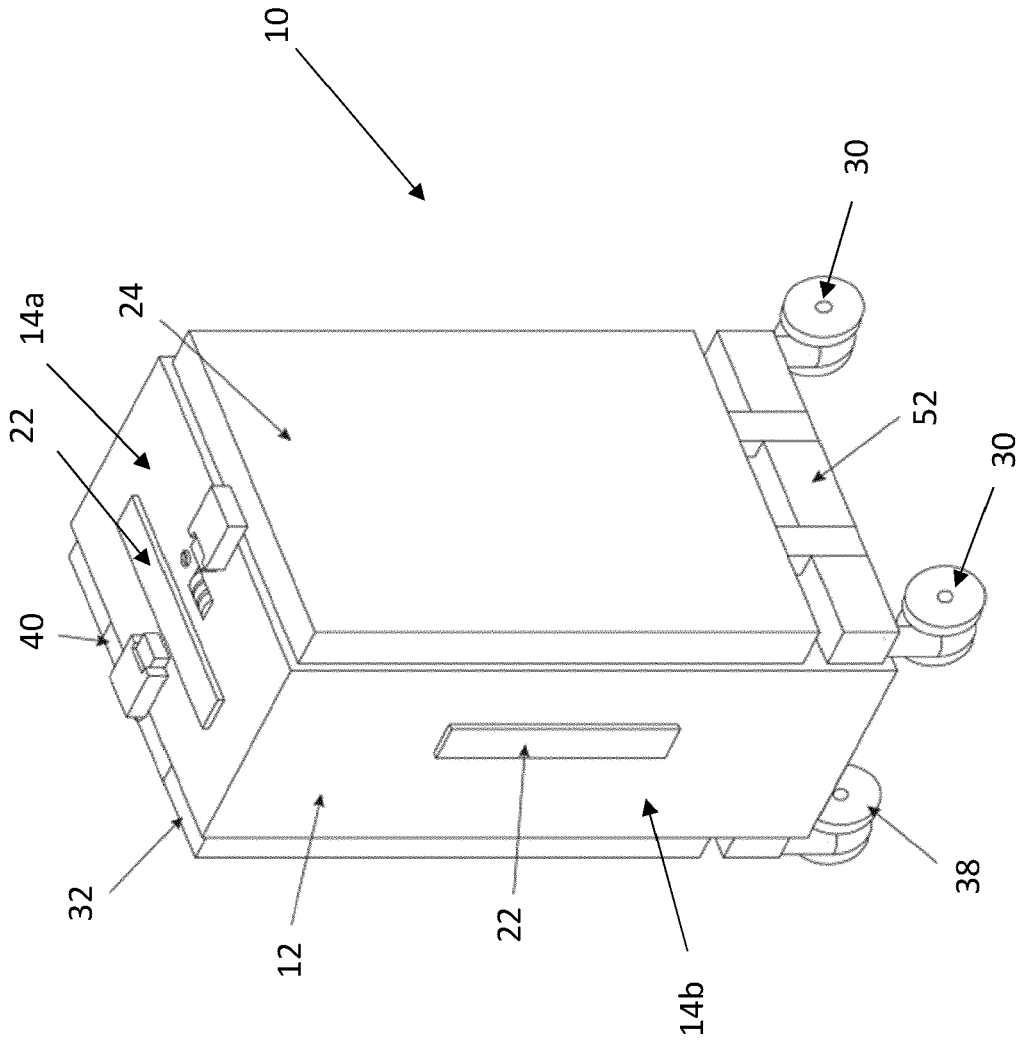

Figure 1

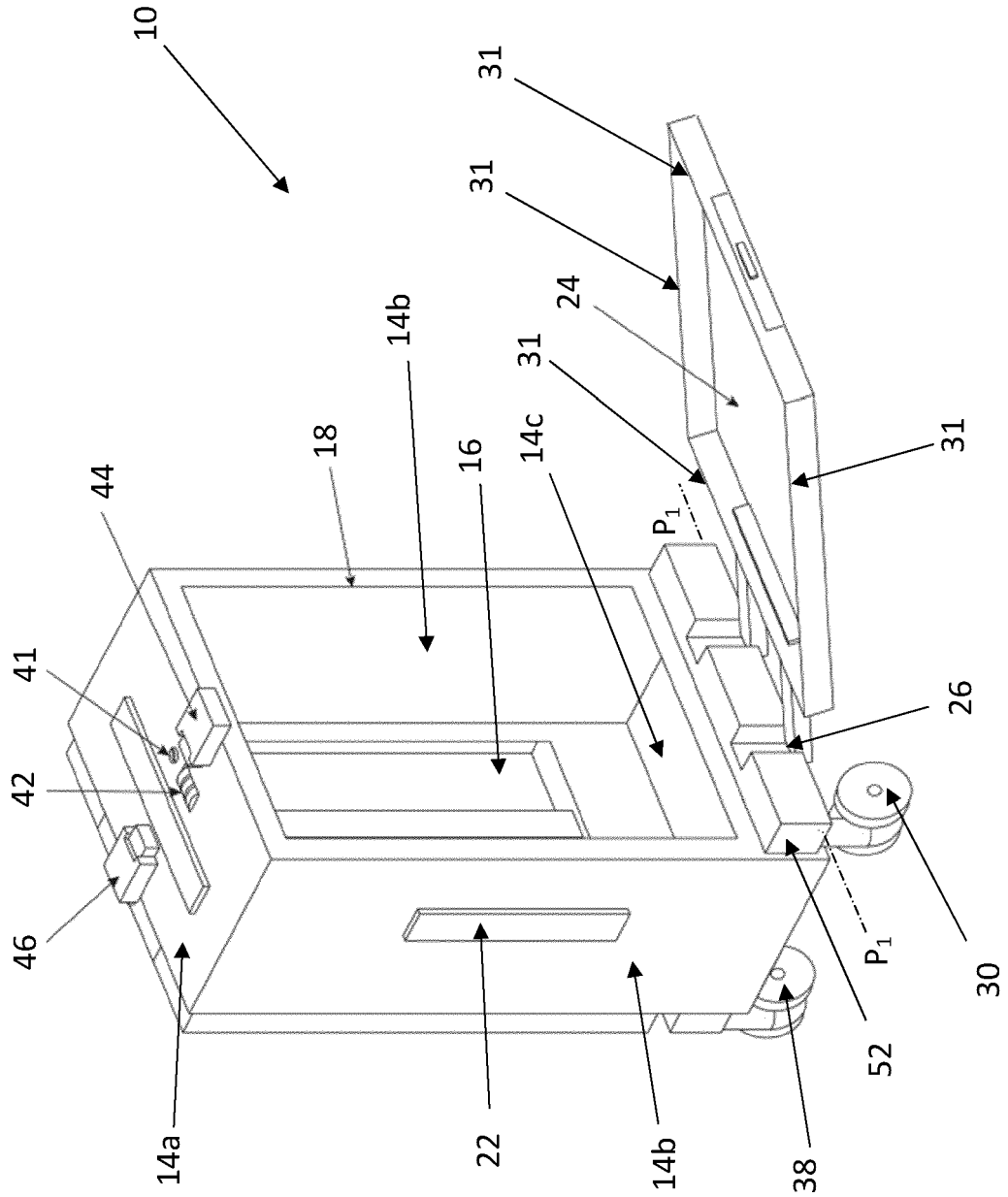
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Figure 2

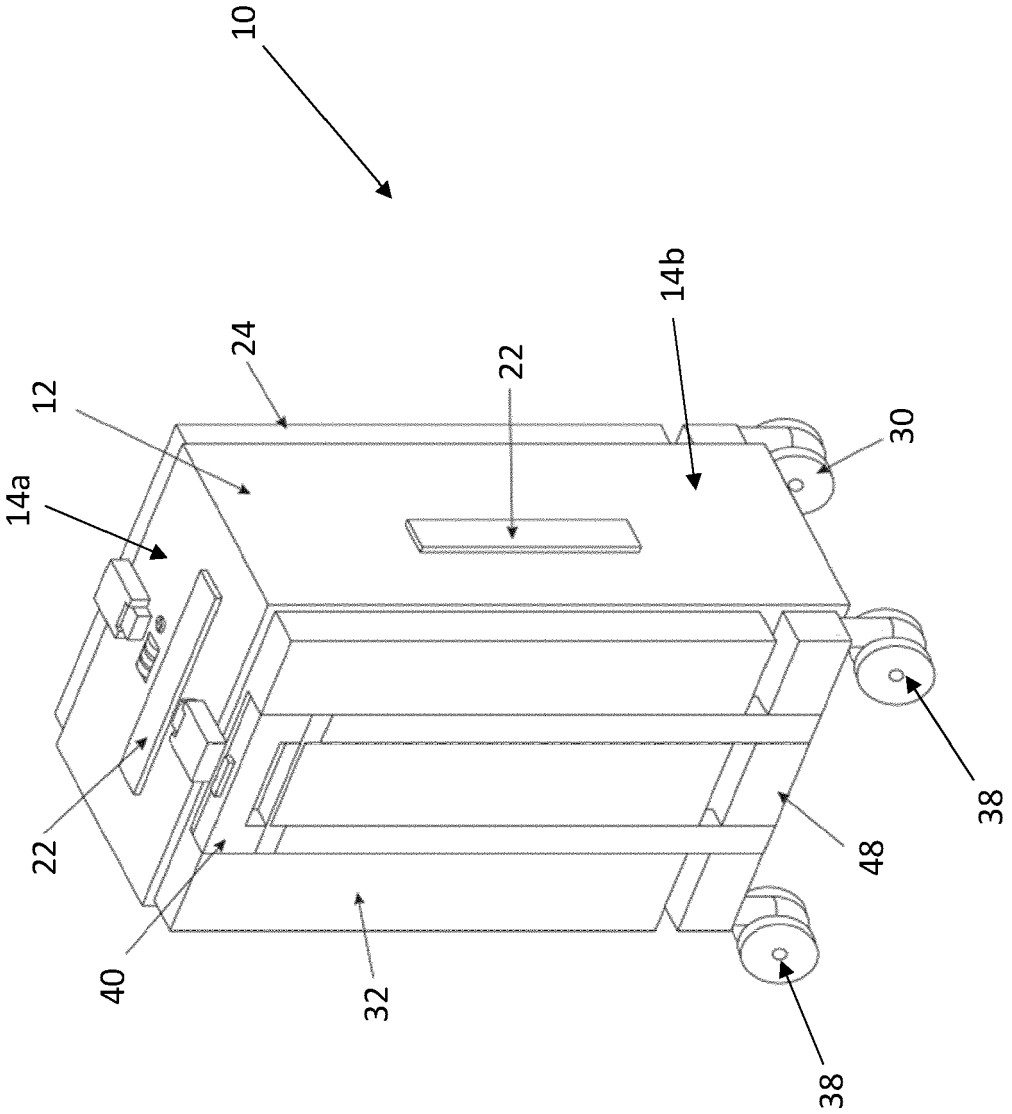

Figure 3

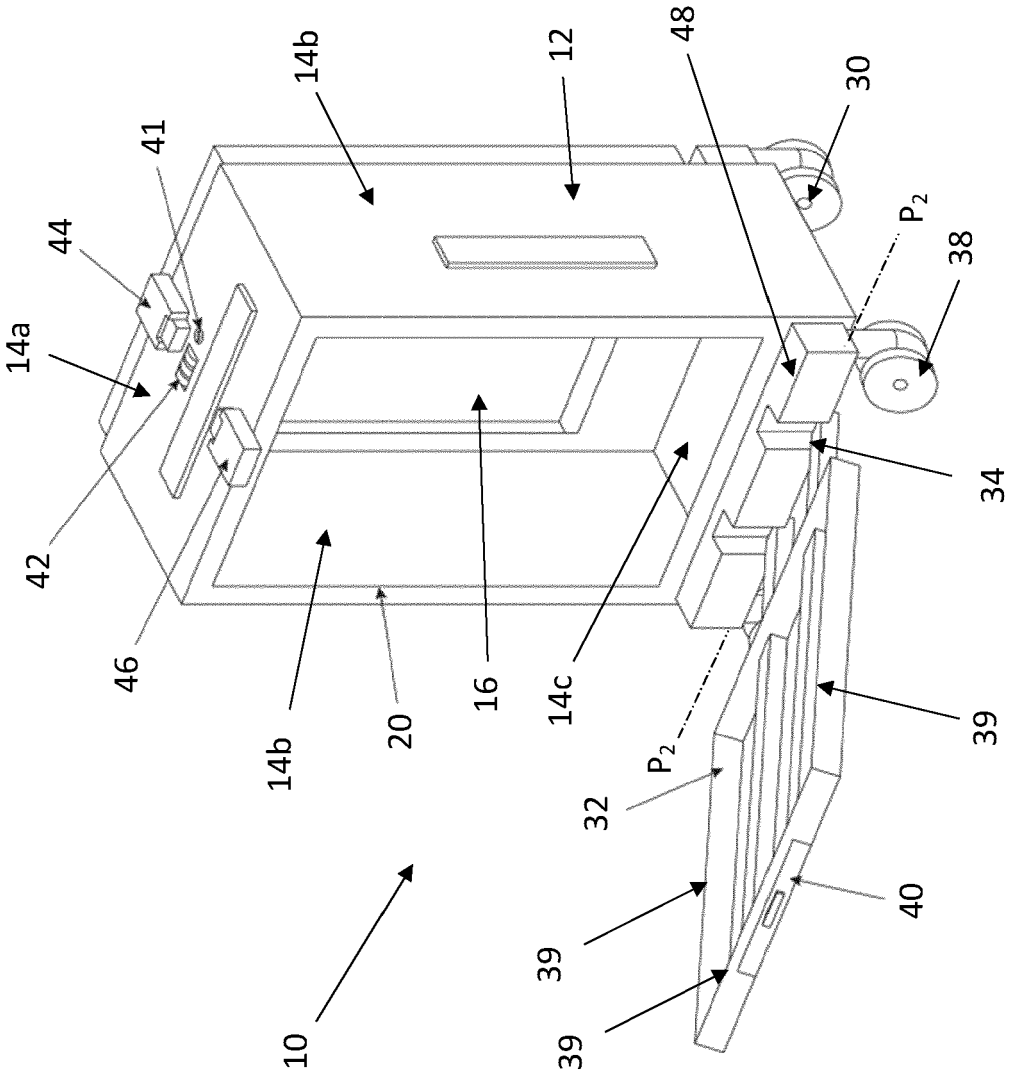
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Figure 4

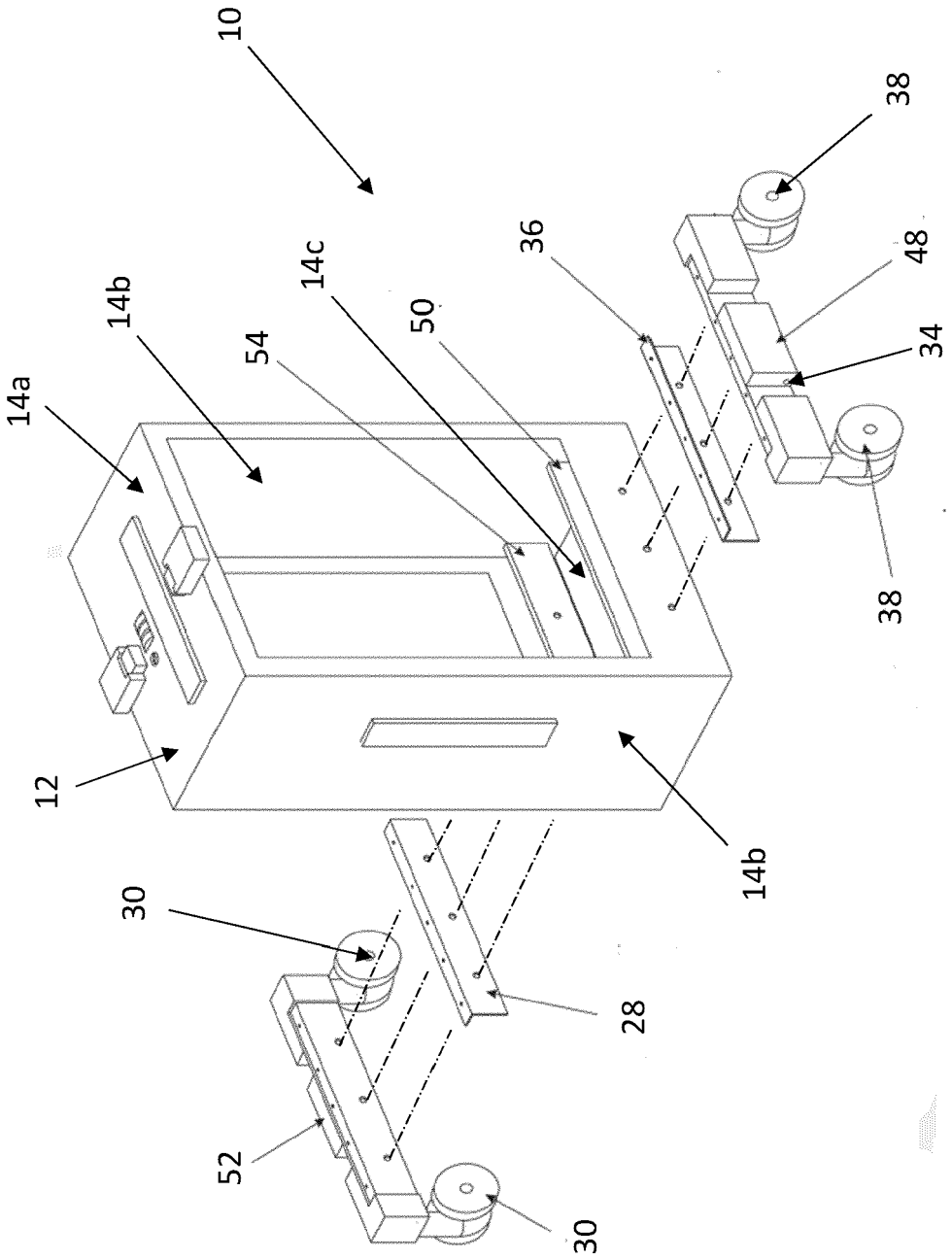

Figure 5

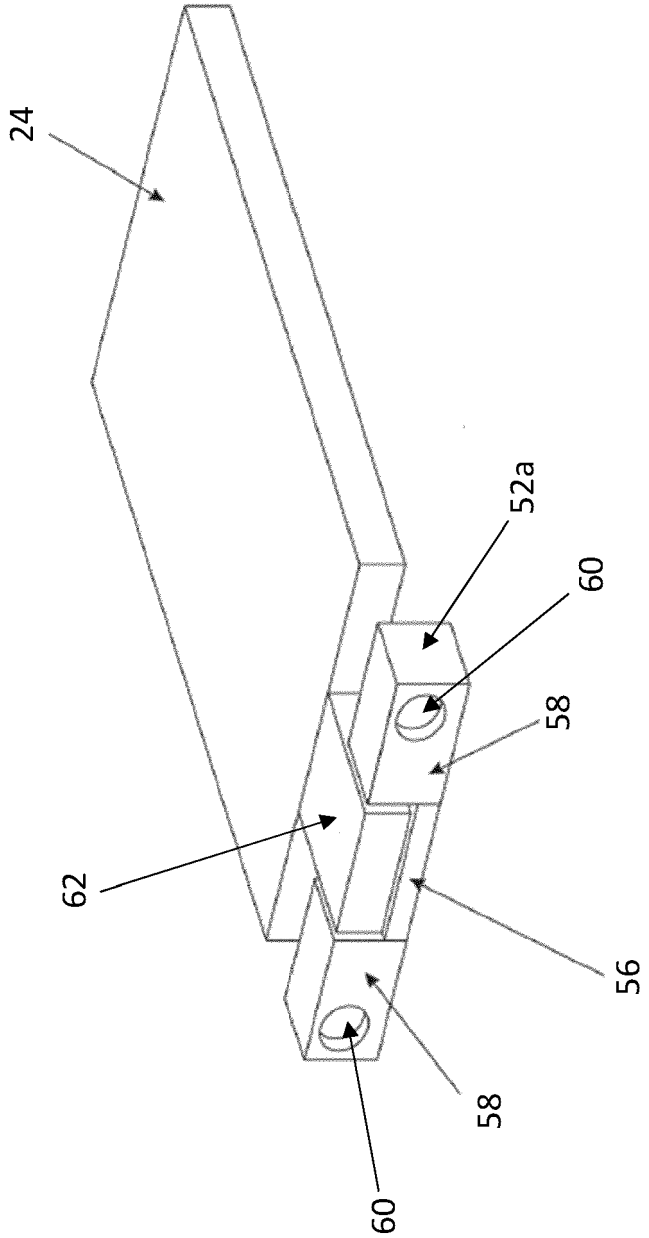

Figure 6

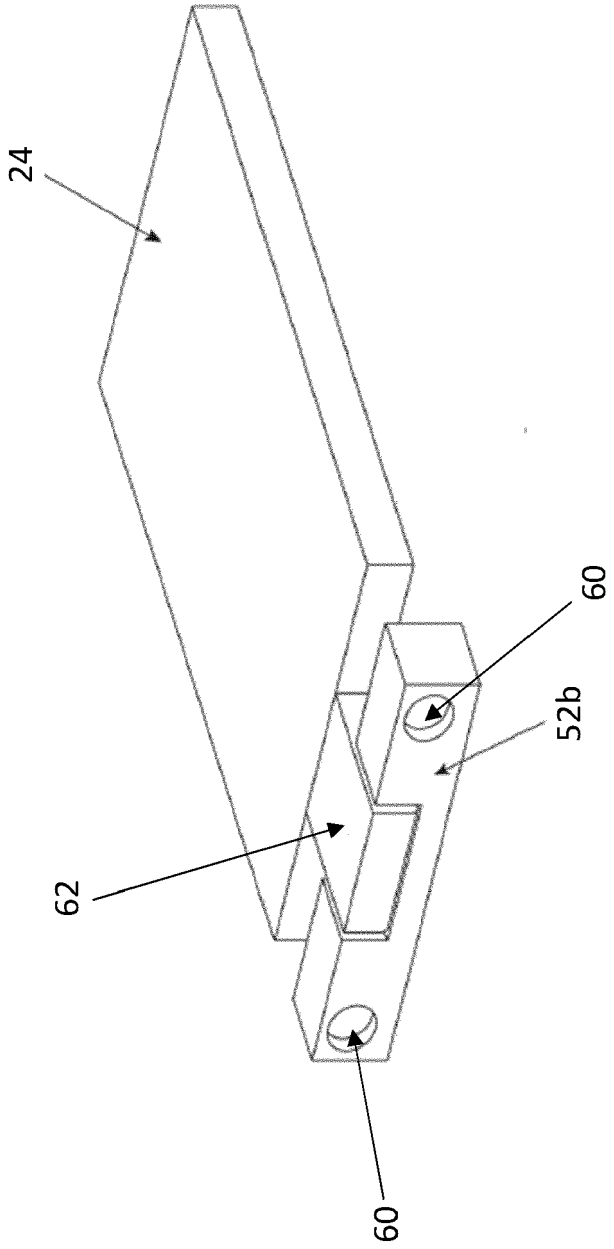

Figure 7

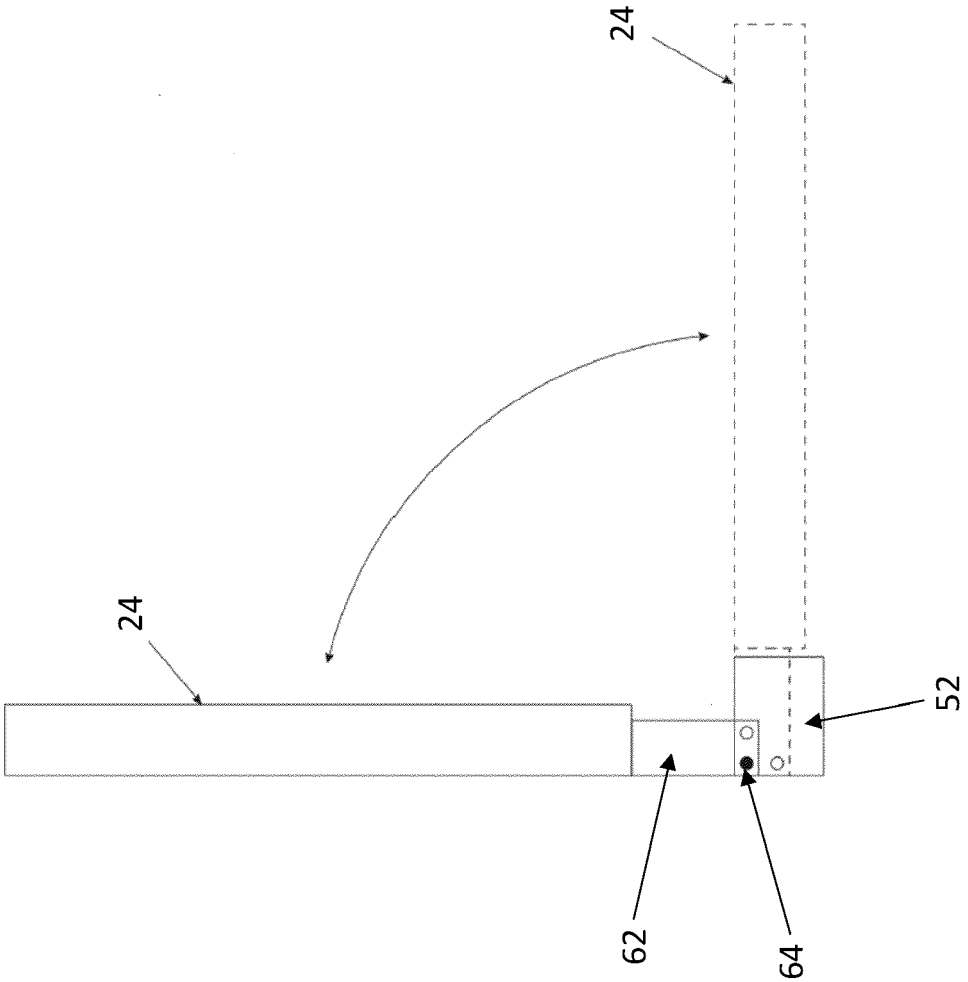

Figure 8

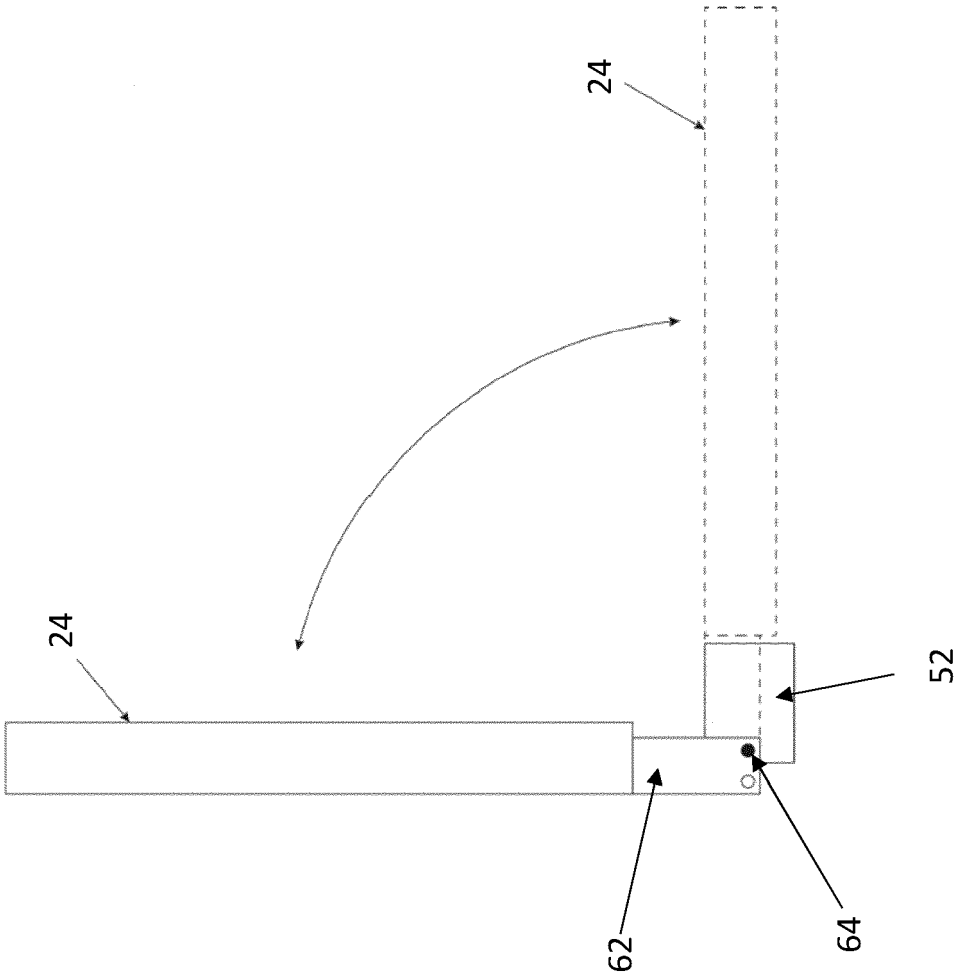

Figure 9

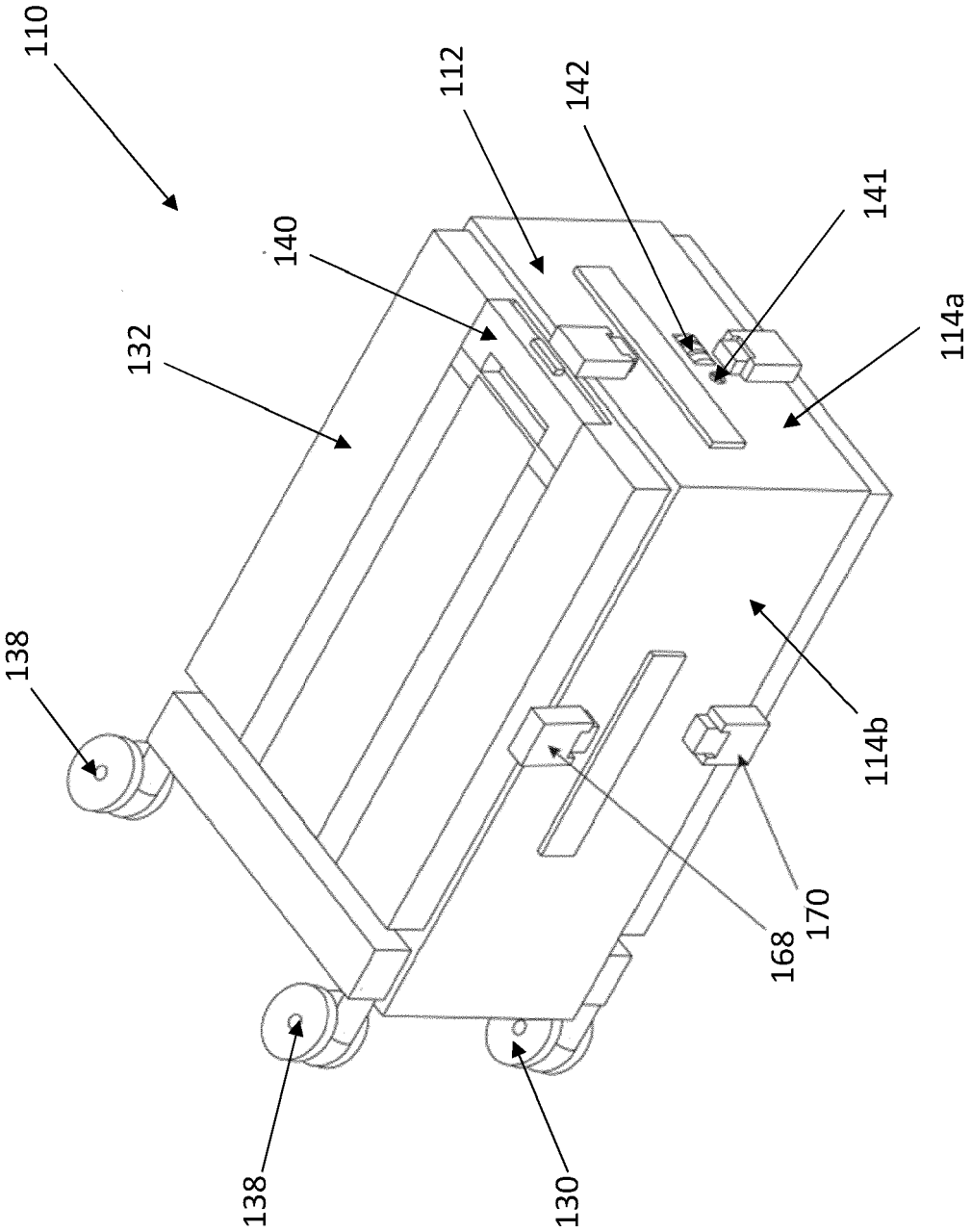

Figure 10

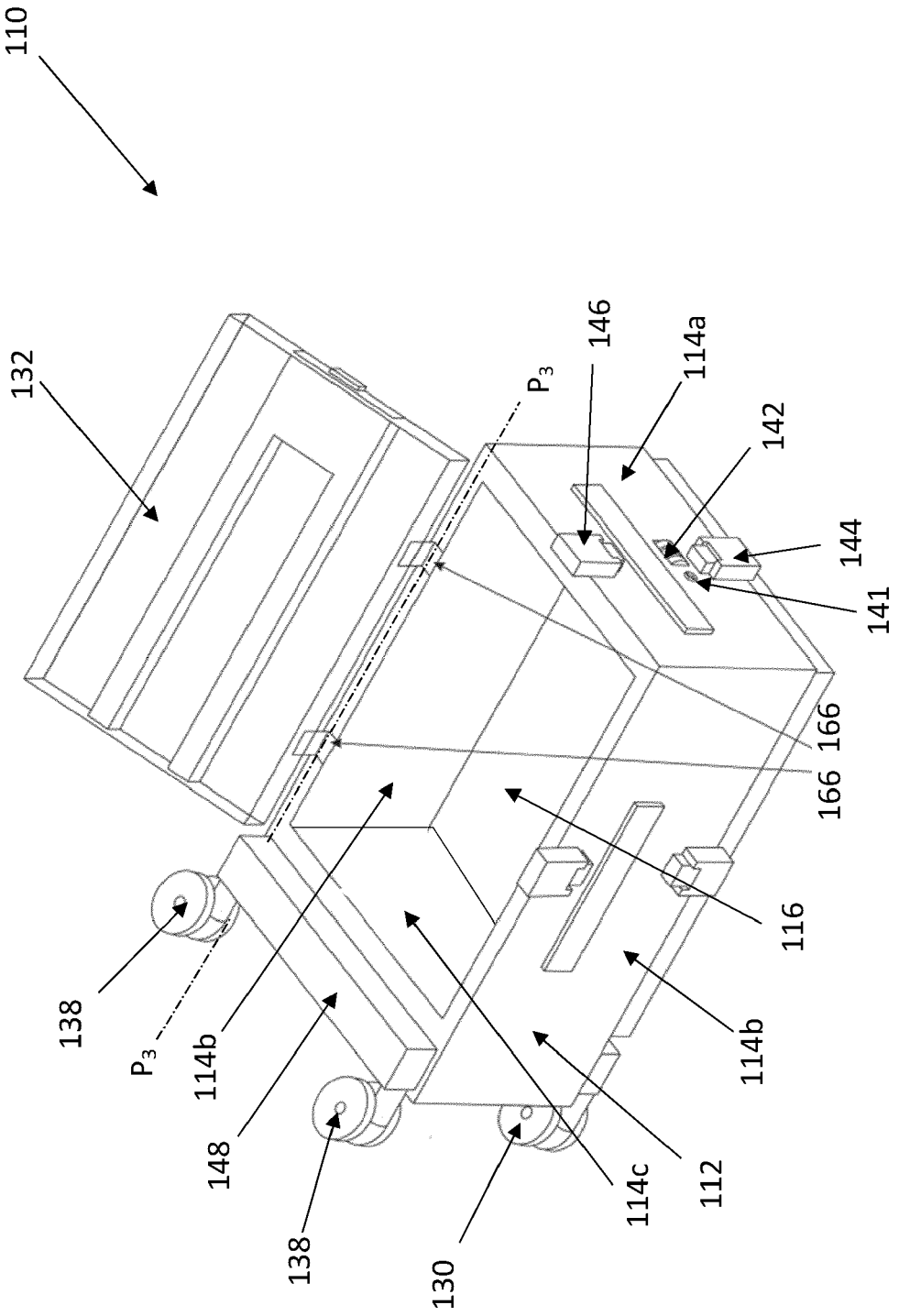
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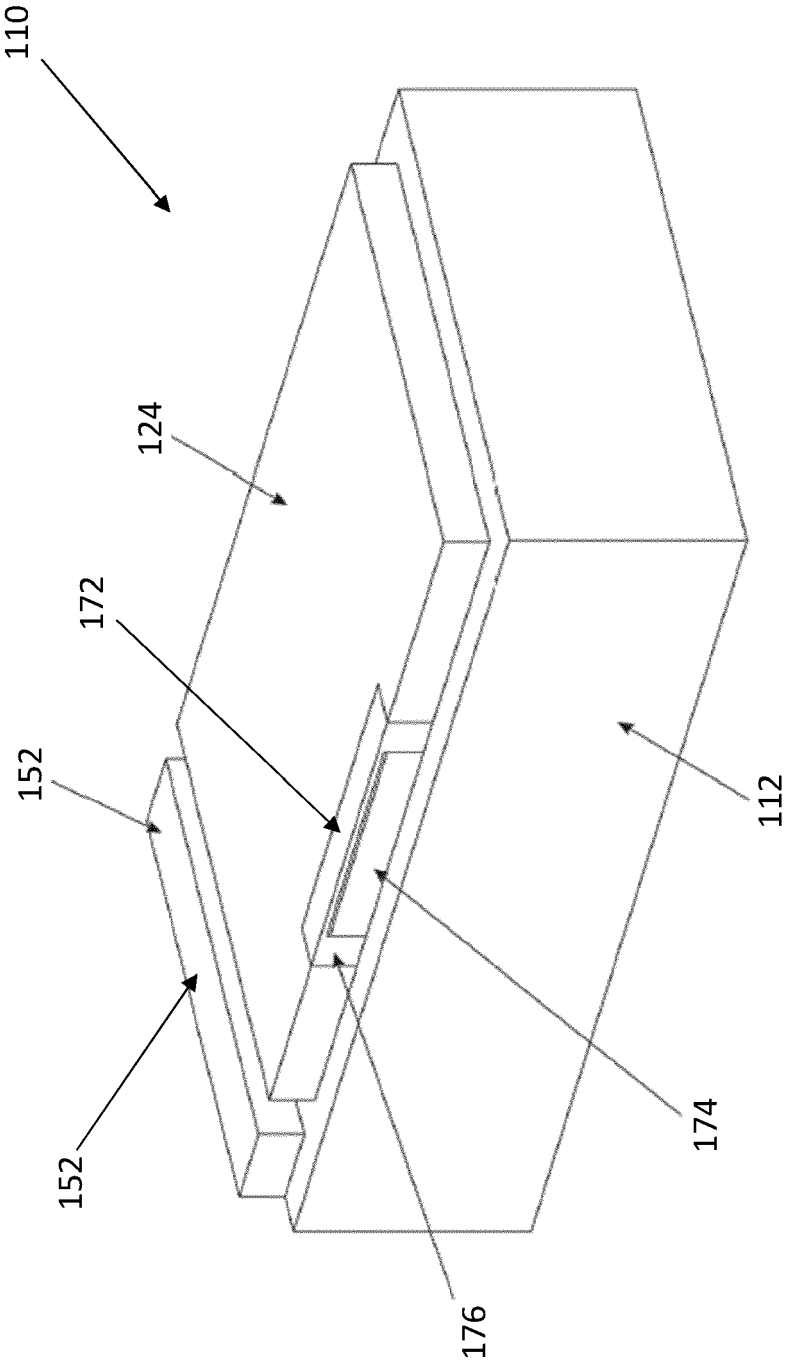
Figure 11



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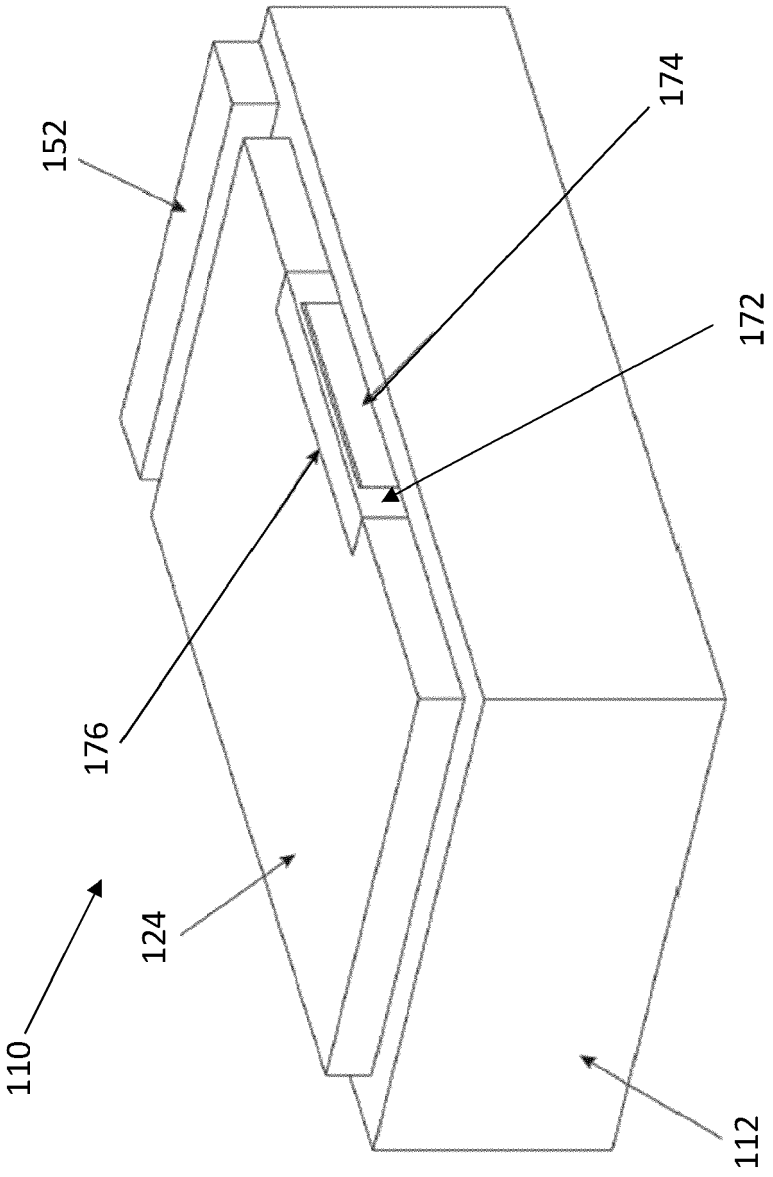
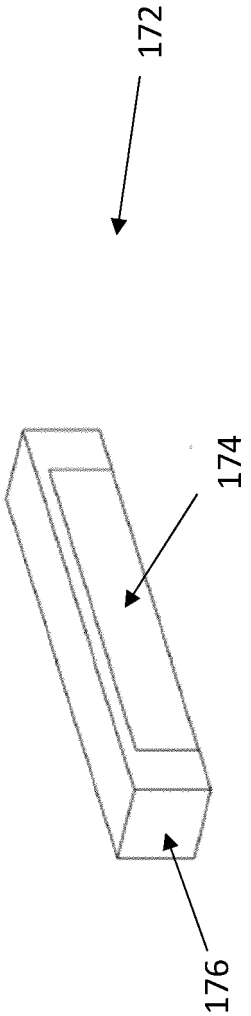


Figure 13



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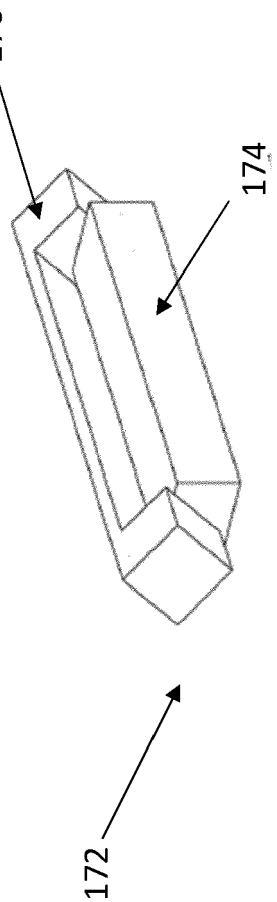

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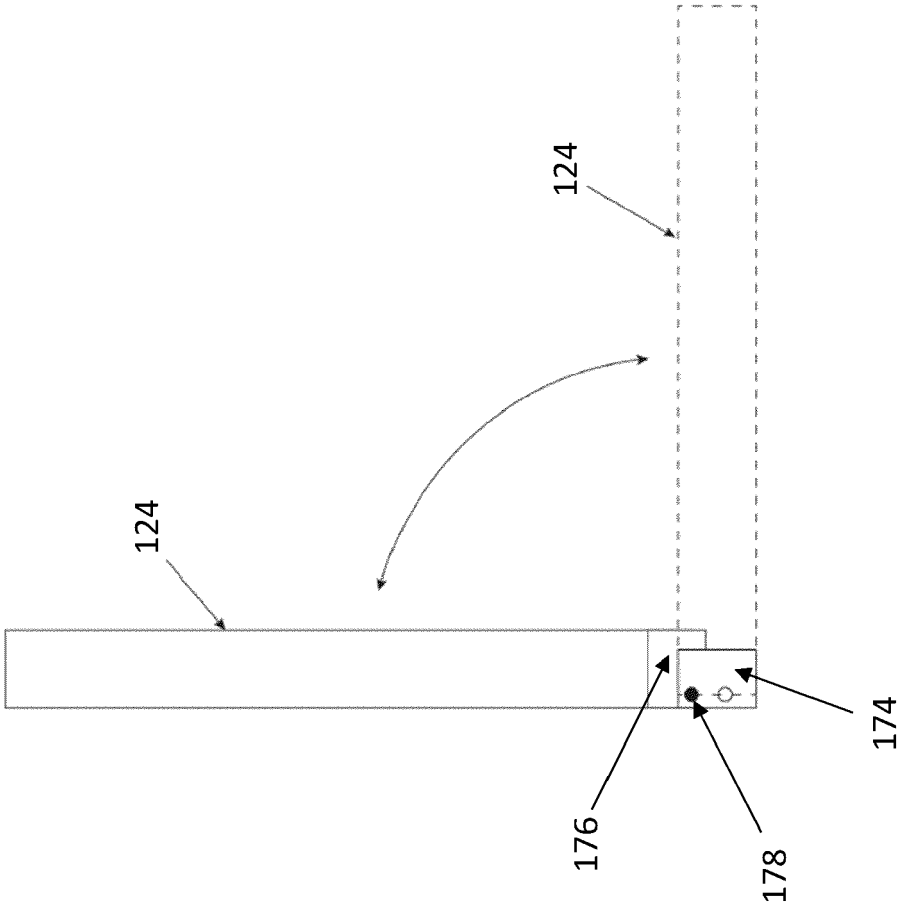

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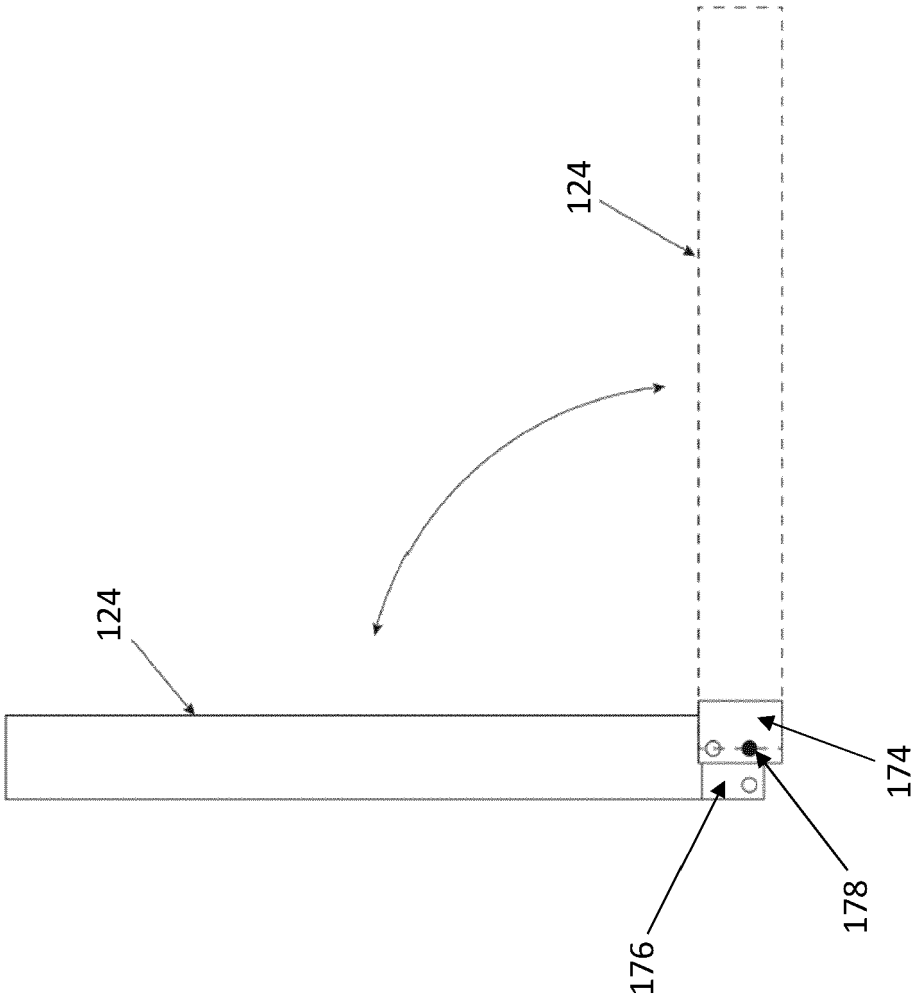

Figure 17

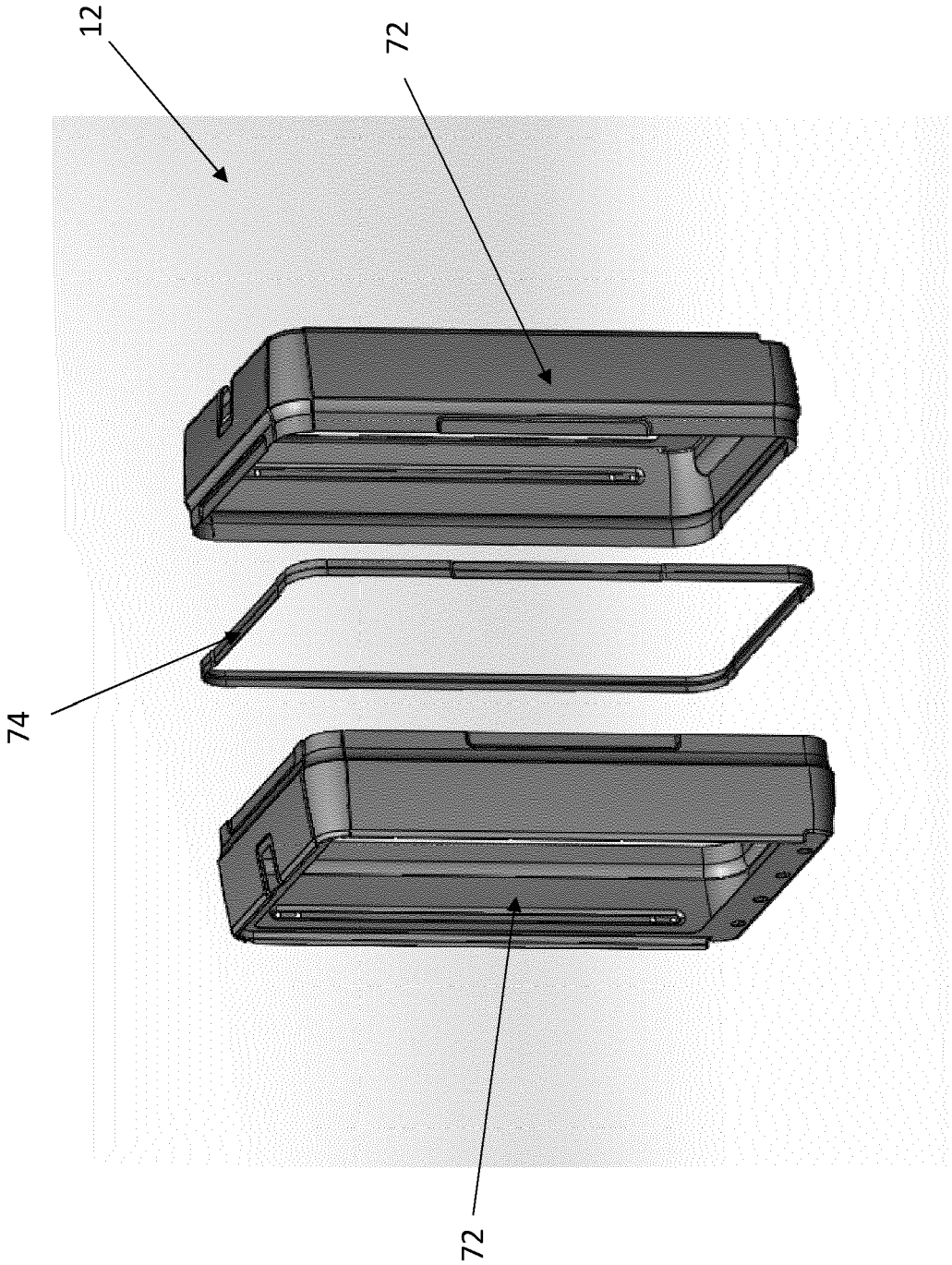

Figure 18

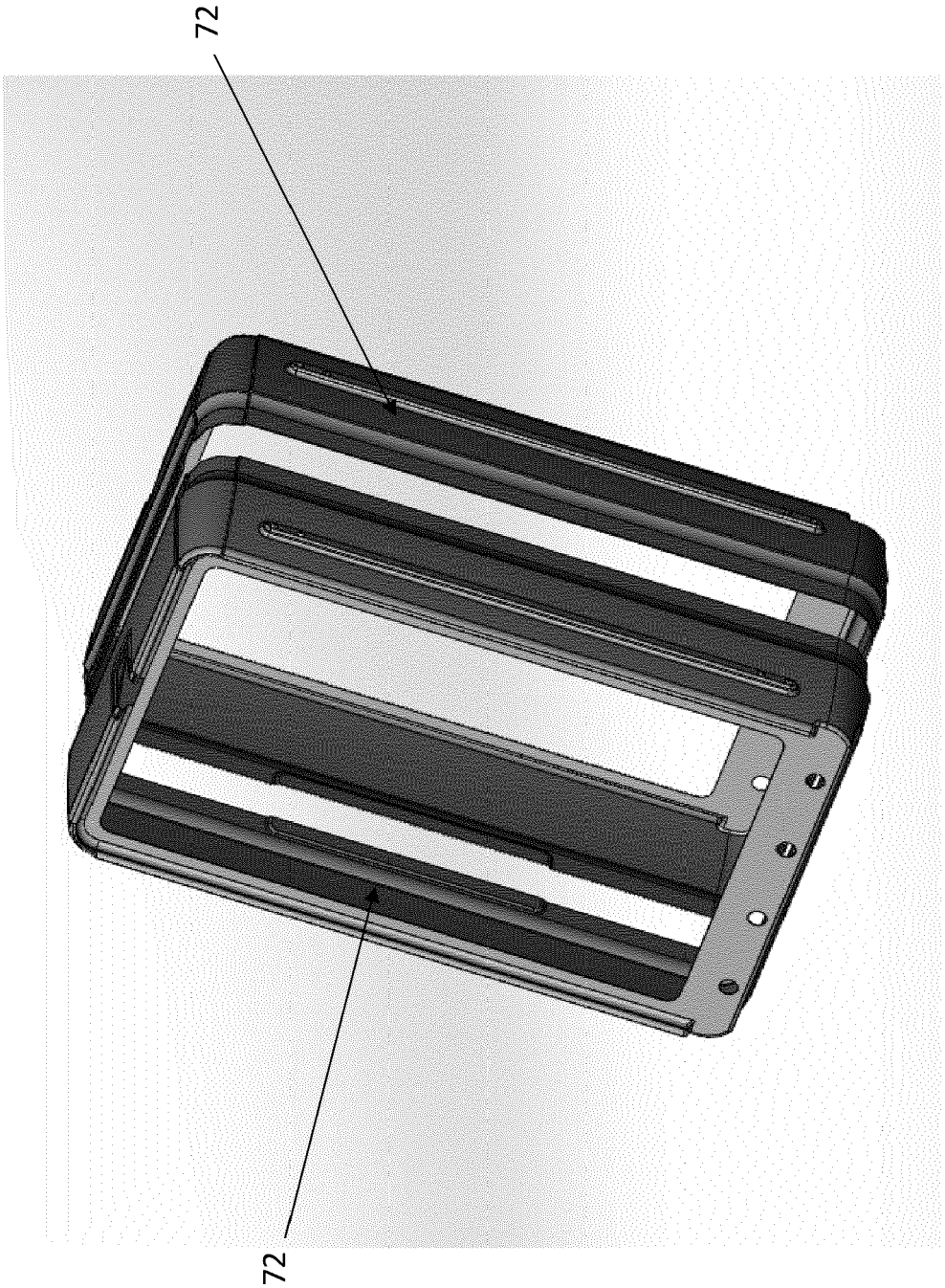

Figure 19

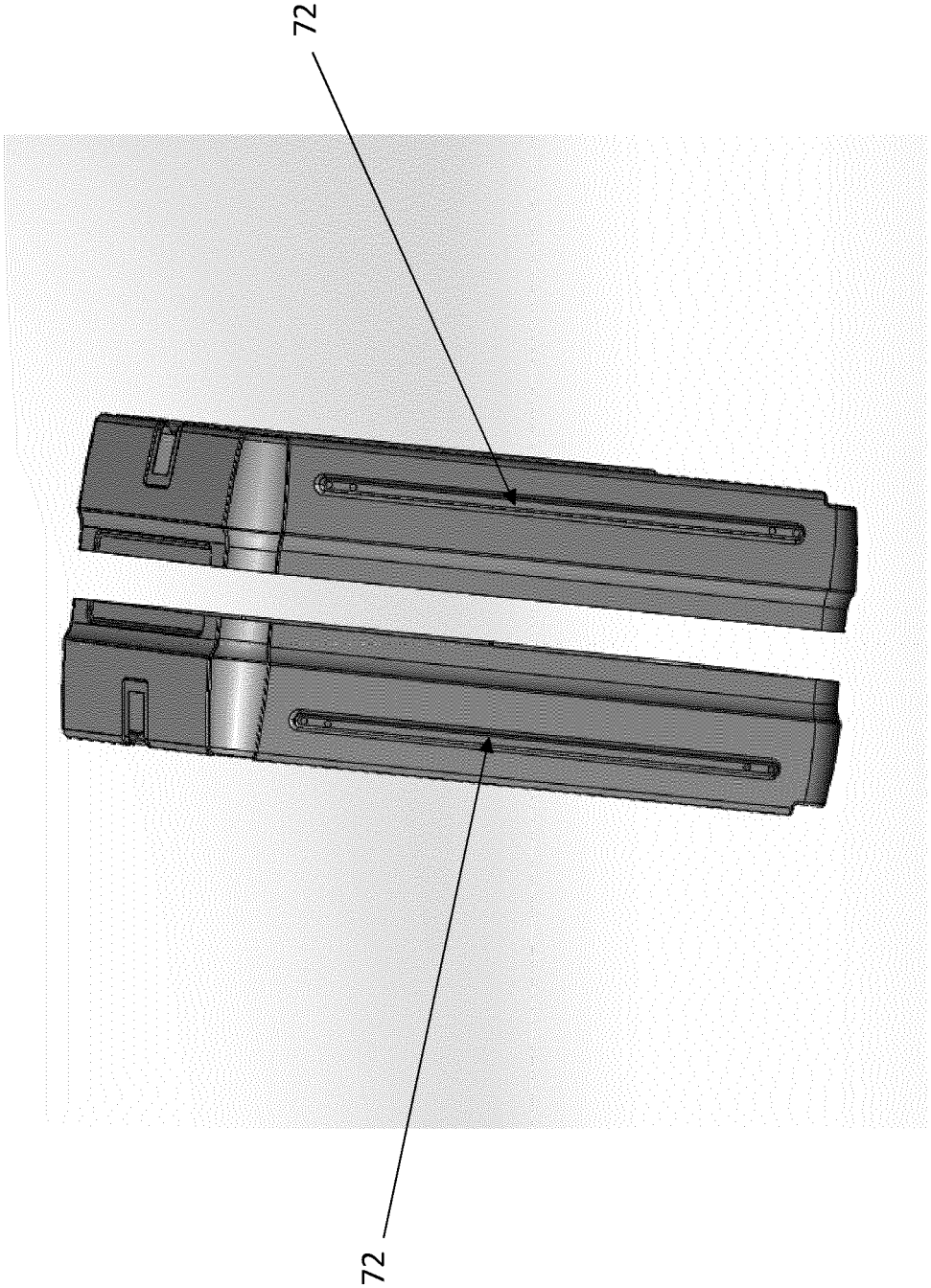

Figure 20

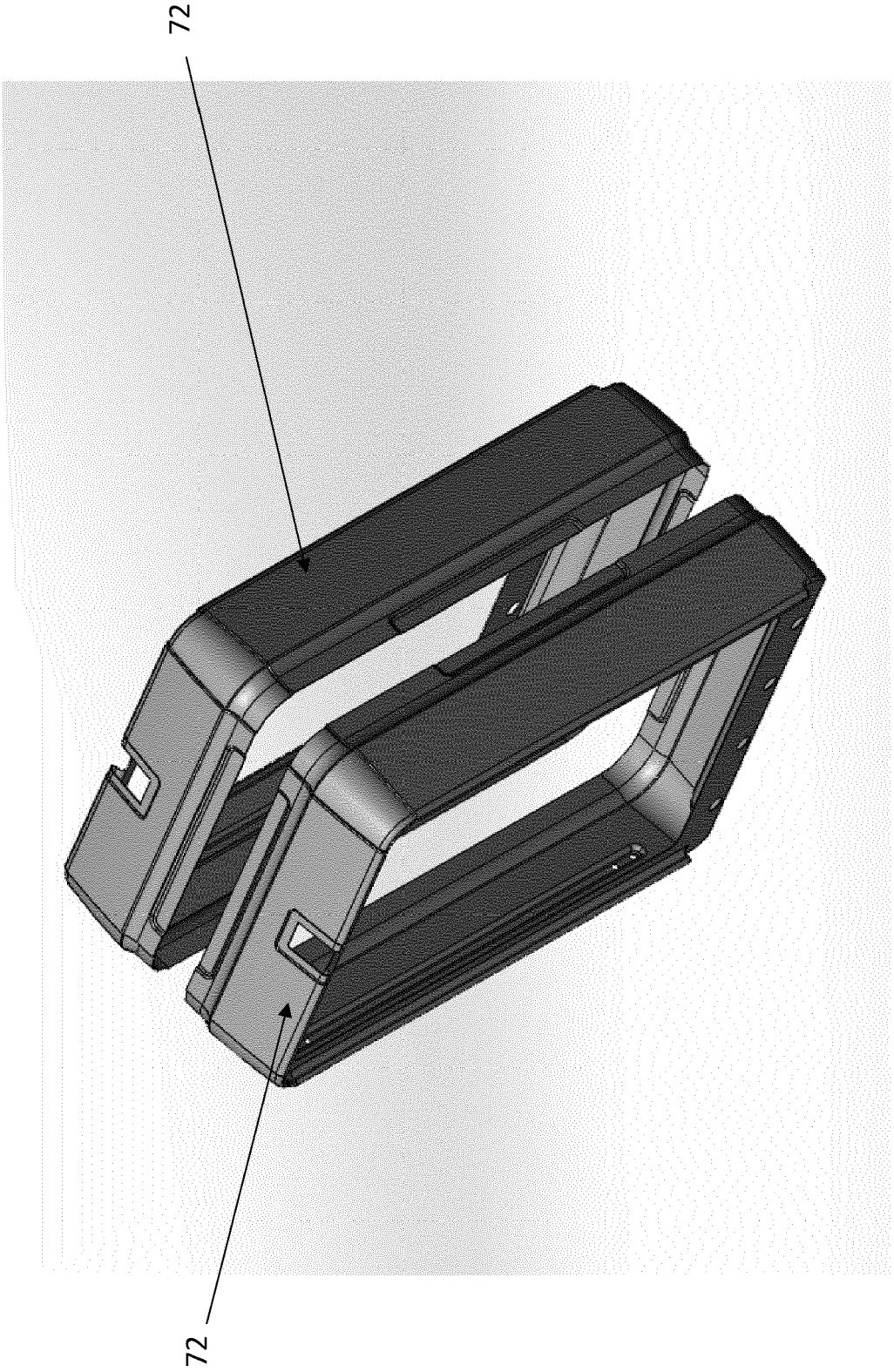

Figure 21

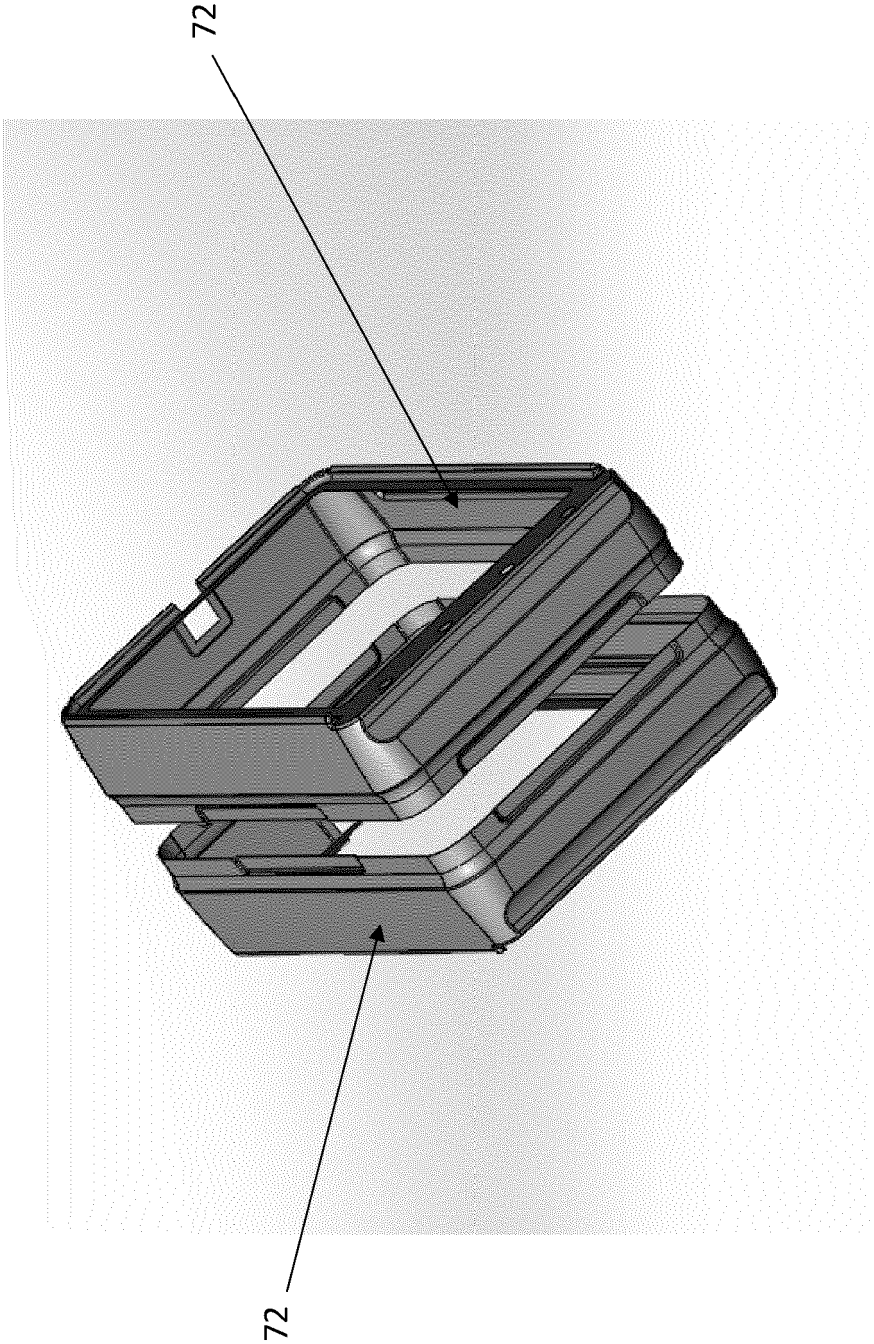

Figure 22

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 January 2024	Nicolás, Carlos

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