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(54) **COUPLING MECHANISM**

(57) The present application discloses a coupling mechanism between the container's corner pieces, comprised of a base plate (1) with two holes, two welded plates (2) to the base plate (1), a threaded shaft (3) comprehended by two different threads and a central gear and two plates with threaded holes (5). The mechanism is actuated by a key (4) acting on the threaded shaft (3) which can be triggered by, for example, a controlled tightening machine.

Thus, the present technology besides allowing the definitive fixing between the corner pieces (6), it also promotes the removal of any clearances and ensures the stability of the whole set.

This coupling mechanism will have as its main purpose the connection between transformed containers, which will serve as hotels, residential buildings, or commercial.

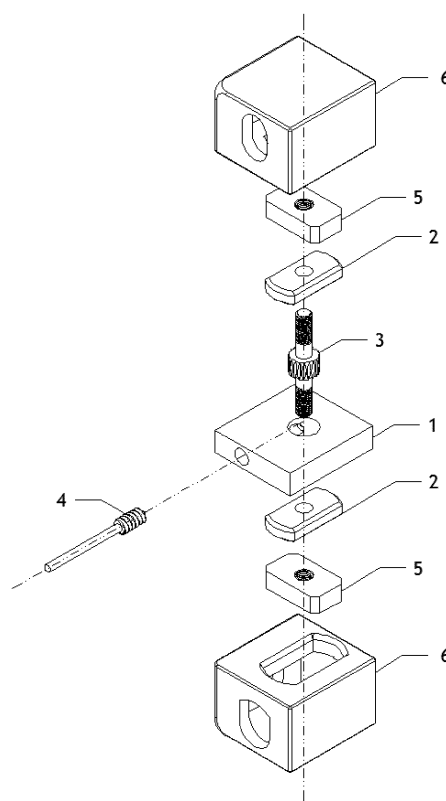


Figure 1

Description

Technical domain

[0001] The present application describes a coupling mechanism between cargo containers corner pieces.

Background

[0002] Regarding the connection between container corner pieces, it is known in the state of the art the existence of forms of connection of different pieces with each other and/or with external structures. The corner pieces known from the prior art perform this connection on a temporary basis and do not eliminate completely the existing clearances between the different pieces.

[0003] There is a great diversity of this type of mechanisms, which may be separated into two major groups, those with a manual operation where the activation of a locking mechanism is required by at least one user, and those featuring an automatic locking function where the lock is performed autonomously when the containers come into contact with each other. Both mechanisms are often used as fastening means of cargo containers on ships and on road trucks.

[0004] For some applications, where standard cargo containers are used, it is essential that the existing clearance in traditional connections do not exist. There are companies commercializing connection pieces that allow coupling cargo containers to each other via existing pieces in the corners of the container, without clearance using cast steel pieces specially designed for the purpose.

[0005] The main difference of the mechanism now disclosed versus the more traditional mechanisms, whether automatic or manual, resides in the elimination of clearances and the execution of the mechanism using technology used in mechanical engineering without the need for molds. This mechanism when compared with the mechanisms that already eliminate clearances allows the execution of the piece without the use of molds for casting of steel.

Summary

[0006] The present application discloses a coupling mechanism comprising:

- a base plate with a longitudinal drilling and a vertical drilling;
- two plates welded to the base plate;
- a threaded shaft with two different threads and a central gear;
- two plates with threaded hole;
- a key;
- two corner pieces.

[0007] In one embodiment, the threaded shaft of the coupling mechanism comprises a right-hand thread, a

left-hand thread and a central gear driven through the key.

[0008] In another embodiment, the grip around the coupling mechanism is actuated by the key that is inserted into the base plate.

[0009] In yet another embodiment, the welded plates of the coupling mechanism have beveled edges.

[0010] In one embodiment, the longitudinal drilling of the coupling mechanism's base plate receives the drive key and vertical drilling able to receive the gear of the threaded shaft.

[0011] In another embodiment, the plates with threaded hole of the coupling mechanism are beveled at the vertical edges.

[0012] In yet another embodiment, the coupling mechanism is carried out without the use of molds to materialize the pieces.

[0013] In one embodiment, the coupling mechanism is reversible. The present application further describes the use of the coupling mechanism as containers fastening means.

General description

[0014] The present application describes a coupling mechanism between cargo container corner pieces that allows the definitive fixation between both elements, eliminating any clearances. Elimination of clearances is accomplished by direct contact between the various components, promoted by the grip of the system.

[0015] The mechanism described in this application makes the connection between containers without clearances, using pieces of metal construction, which can be manufactured in metal industry workshops. With this mechanism, molds are not necessary for casting of special pieces. This is a practical system in assembly, easy to manufacture and inexpensive. This coupling mechanism is often used as containers fastening means.

Brief description of the Figures

[0016] For an easier understanding of the art, drawings are herein attached, which represent preferred embodiments of the invention which, however, do not intend to limit the object of the present application.

Figure 1 illustrates a form of schematic representation of the coupling mechanism between containers corner pieces, where the reference numbers represent:

- 1 - Base plate;
- 2 - Welded plate;
- 3 - Threaded shaft;
- 4 - Key;
- 5 - Plate with threaded hole;
- 6 - Piece corner.

Figure 2 illustrates a form of 3D representation of the base plate (1) with the perpendicular and parallel drillings.

Figure 3 illustrates a sectional view of the base plate (1) where the hole for the key input (4) is glimpsed.

Figure 4 illustrates a view of one of the plates (2) to be welded to the base plate (1).

Figure 5 illustrates a view of the already welded plate.

Figure 6 illustrates a 3D view of the set formed by the base plate (1), threaded shaft (3) and welded plates (2).

Figure 7 illustrates a front view of the piece with the threaded shaft (3).

Figure 8 illustrates a 3D view of the plate (5) where the shaft (3) will be screwed.

Figure 9 illustrates a 3D view of the key (4).

Figure 10 illustrates a sectional view with the key (4) inserted into the mechanism.

Figure 11 illustrates a sectional view of the coupling mechanism.

Figure 12 illustrates an exploded view of the components of the coupling mechanism.

Figure 13 illustrates a 3D view of the mechanism in its final position, with the key (4) inserted.

Figure 14 illustrates a variant of the coupling mechanism where it is possible to connect four containers.

Description of the embodiments

[0017] In a preferred embodiment, the coupling mechanism is comprised of a base plate (1), two welded plates (2) to the base plate (1), a threaded shaft (3) with central gear, coupled within the plate base (1), forming a single set as illustrated in Figure 6. Still a part of the coupling mechanism, two plates with threaded holes (5). The set formed by base plate (1), welded plates (2) and threaded shaft (3) is placed between two container corners, the welded plates (2) re-entering in the container corner pieces. The plates with threaded hole (5) are then positioned within the corner pieces. The coupling mechanism is actuated by means of a key (4) which in turn is actuated by manual or automatic rotary tool, with a controlled grip, over the gear of the threaded shaft (3).

[0018] In Figure 1 a schematic representation of the coupling mechanism between an upper left corner and

bottom left corner of two containers is presented.

[0019] The base component of the connection is the set that lies between the two corner pieces of the containers. This set is comprised of a base plate (1) by two welded plates (2) and the threaded shaft (3). The base plate (1) represents two drillings. From those drillings, one is made vertically, allowing later housing of the gear associated to the threaded shaft (3) and another is performed longitudinally, serving to insert the key (4).

[0020] After making the drillings described in the base plate (1), it is welded one of the welded remaining plates (2). The geometry of said welded plates (2) is similar to the geometry of the openings in the corner connection pieces between containers, to later allow a good fit. Its edges may be beveled on one side to facilitate snapping the container piece and on the other hand for the preparation of welding joint with the base plate (1). The desired clearance between the welded plates (2) and the corner piece of the container may be similar to traditional metal construction and may apply a clearance comprised between 1.5 and 2.5 mm. The welded plates (2) are still drilled to allow passage of the threaded shaft (3).

[0021] The next step in the assembly of the set is the introduction of the threaded shaft (3) with the gear and subsequent welding of the other welded plate (2), which will lock the shaft in the desired position, completing the execution of the set piece, which will serve as the basis for coupling mechanism.

[0022] The threaded shaft (3) has the particularity that one of the threads is a right-hand thread and the other being a left hand thread, so that with a single movement of rotation, there is grip on the two plates with threaded hole (5) that will be within the container corner pieces.

[0023] The components described so far represents a unique mechanism that will be transported with solidarity, i.e. as a whole.

[0024] The mechanism is also composed of two plates with threaded hole (5) that will be introduced inside the containers corner connection pieces and where the threaded shaft (3) will be screwed. These pieces are beveled at the vertical edges to facilitate positioning within the container corner pieces.

[0025] The final piece is the key (4) that will allow triggering the coupling mechanism through the threaded shaft (3).

[0026] The key consists of a bar with circular section, for example, 12 mm in diameter with a worm at one end.

[0027] At the end of the worm, the key has a protrusion which engages in a recess created in the base plate (1).

Application examples

[0028] This coupling mechanism will have as its main purpose the connection between transformed containers, which will serve as hotels, residential buildings, or commercial.

[0029] With this mechanism it is intended to make the connection between containers of the same characteris-

tics as the traditional metallic structures present. With this mechanism the connection will not have clearances, being rigid and resistant to various actions that will request the building constituted by the assembly of several containers. With this mechanism it will be possible to undo any deformations present in the used containers. Since the application of the bonding strength is adjustable, one can apply an increasing load until the existing deformation is cancelled.

[0030] It may also be used for the temporary joining of containers that are intended to eliminate the clearances.

[0031] The mechanism is fully reversible, so it is easily dismantled by reversing the direction of rotation of the threaded shaft.

[0032] The present embodiment is naturally not in any way restricted to the embodiments described herein and a person of ordinary skill in the art can provide many modification possibilities thereof without departing from the general idea, as defined in the claims.

[0033] The preferred embodiments described above are of course combinable with one another. The following claims further define preferred embodiments.

Claims

1. Coupling mechanism comprising:

- a base plate (1) with a longitudinal drilling and a vertical drilling;
- two plates welded (2) to the base plate (1);
- a threaded shaft (3) with two different threads and a central gear that once triggered by the key (4) allows the grip of the set;
- two plates with threaded hole (5).

2. Coupling mechanism according to the preceding claim, wherein the threaded shaft (3) comprises a right-hand thread at one end, a left hand thread at the other end and a central gear.

3. Coupling mechanism according to any one of the preceding claims, wherein the grip of the whole mechanism is triggered by the key (4) that is inserted into the base plate (1) triggering the central gear on the shaft (3).

4. Coupling mechanism according to claim 1, wherein the welded plates (2) have beveled edges.

5. Coupling mechanism according to claim 1, wherein the longitudinal drilling of the base plate (1) receives the triggering key (4) and the vertical drilling is able to receive the gear of the threaded shaft (3).

6. Coupling mechanism according to any one of the preceding claims, wherein the plates with threaded hole (5) are beveled at the vertical edges.

7. Use of the coupling mechanism described in any one of the preceding claims as containers fastening means eliminating any clearances or deformations.

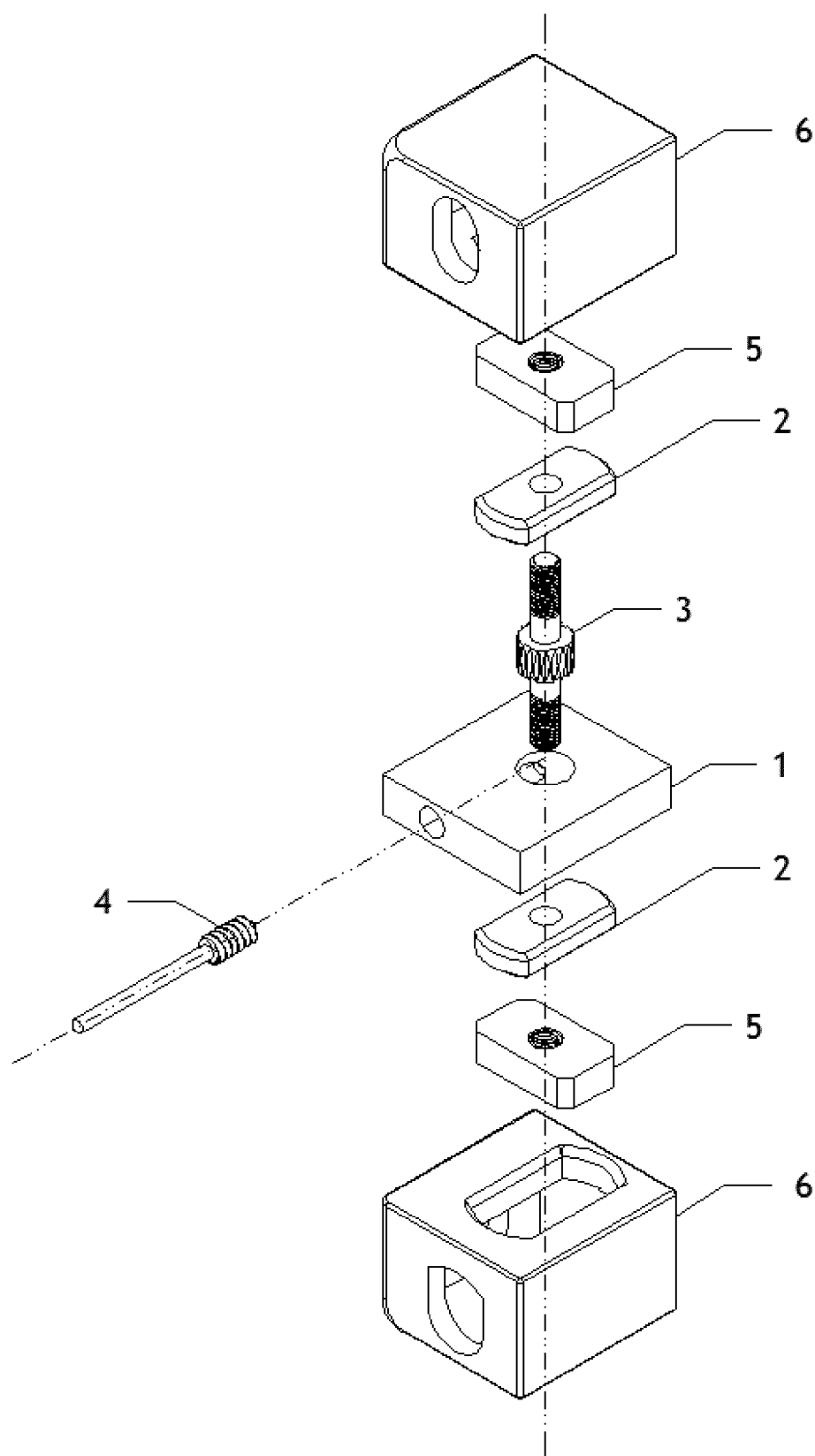


Figure 1

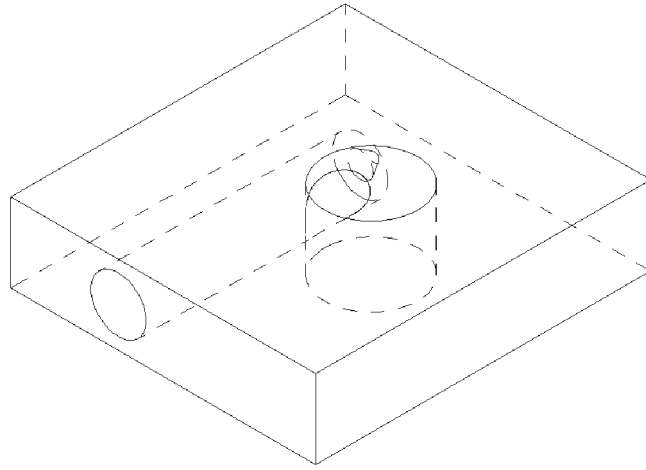


Figure 2

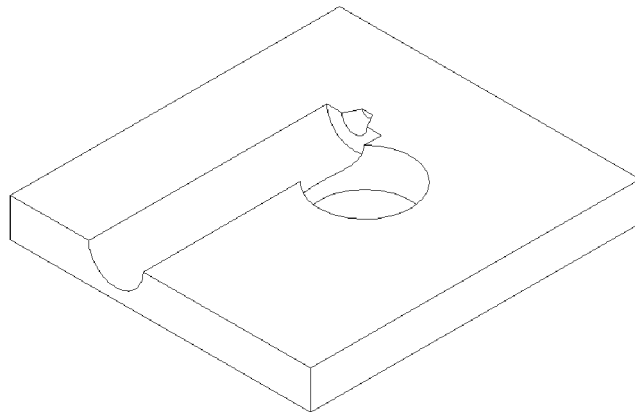


Figure 3

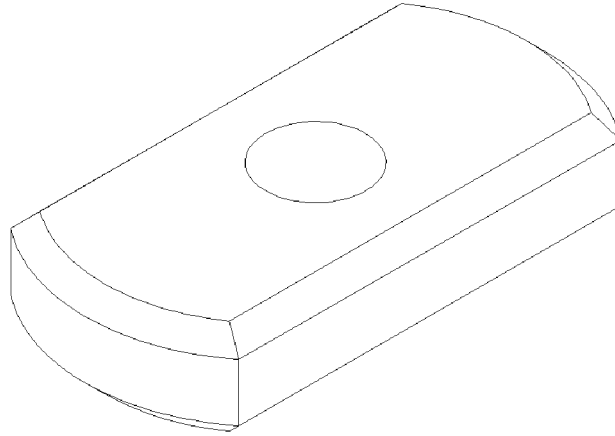


Figure 4

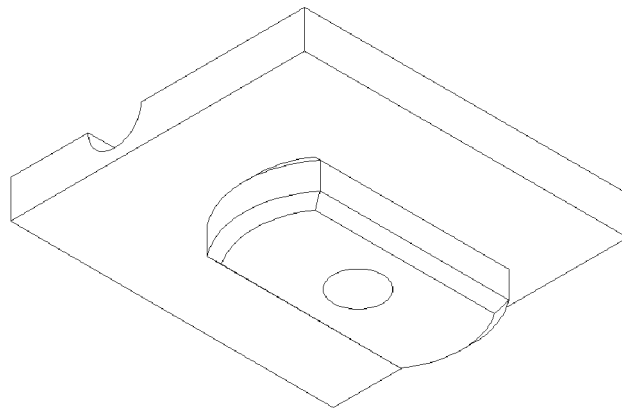


Figure 5

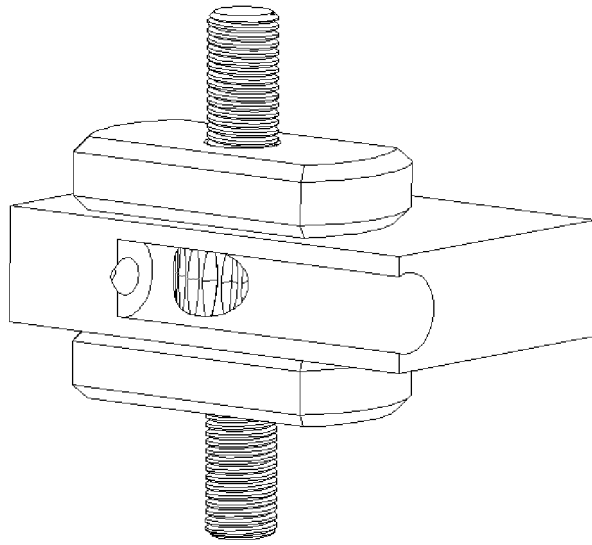


Figure 6

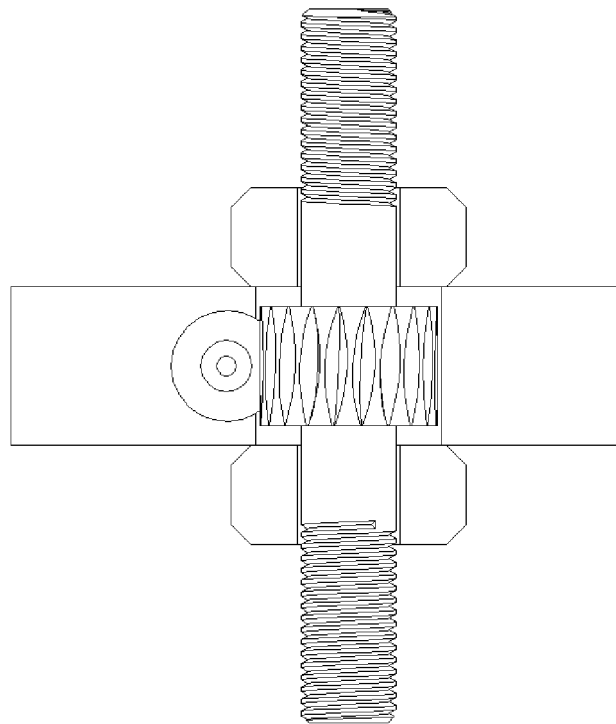


Figure 7

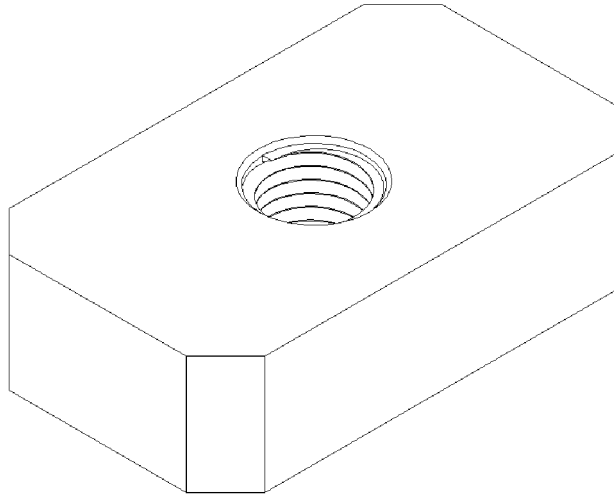


Figure 8

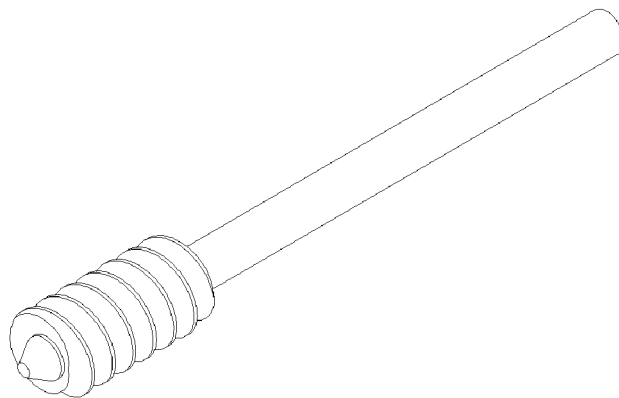


Figure 9

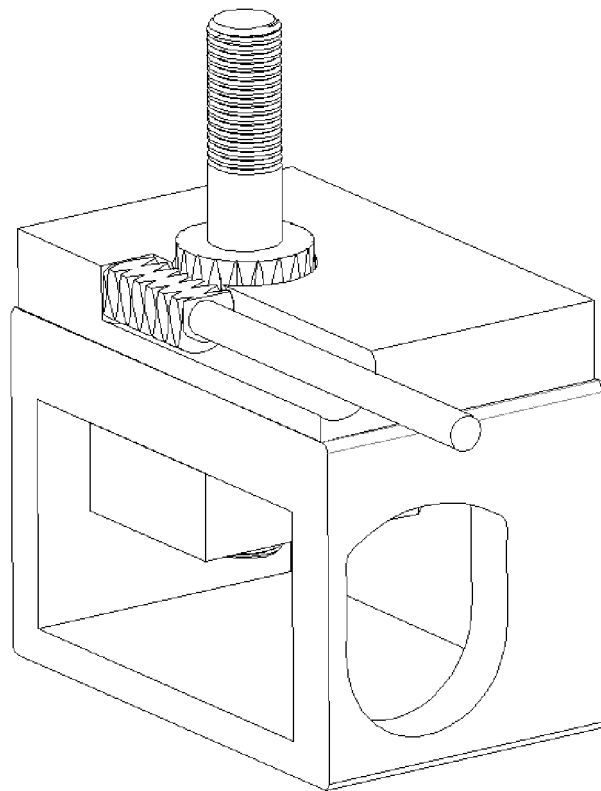


Figure 10

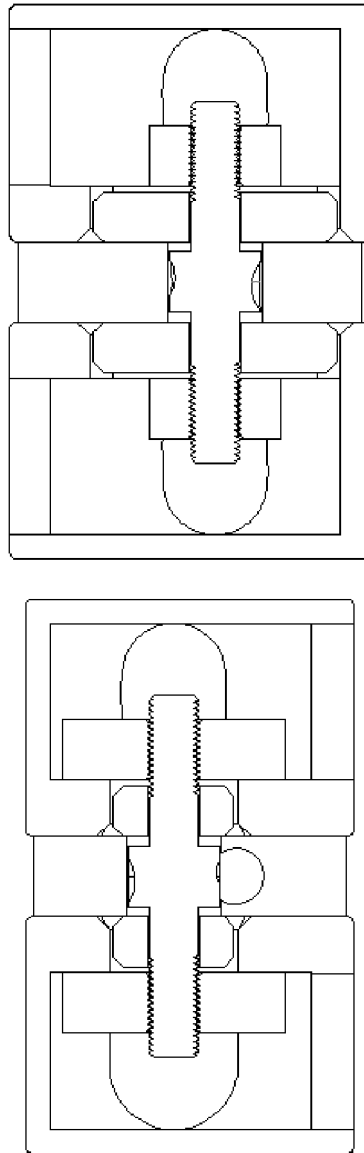


Figure 11

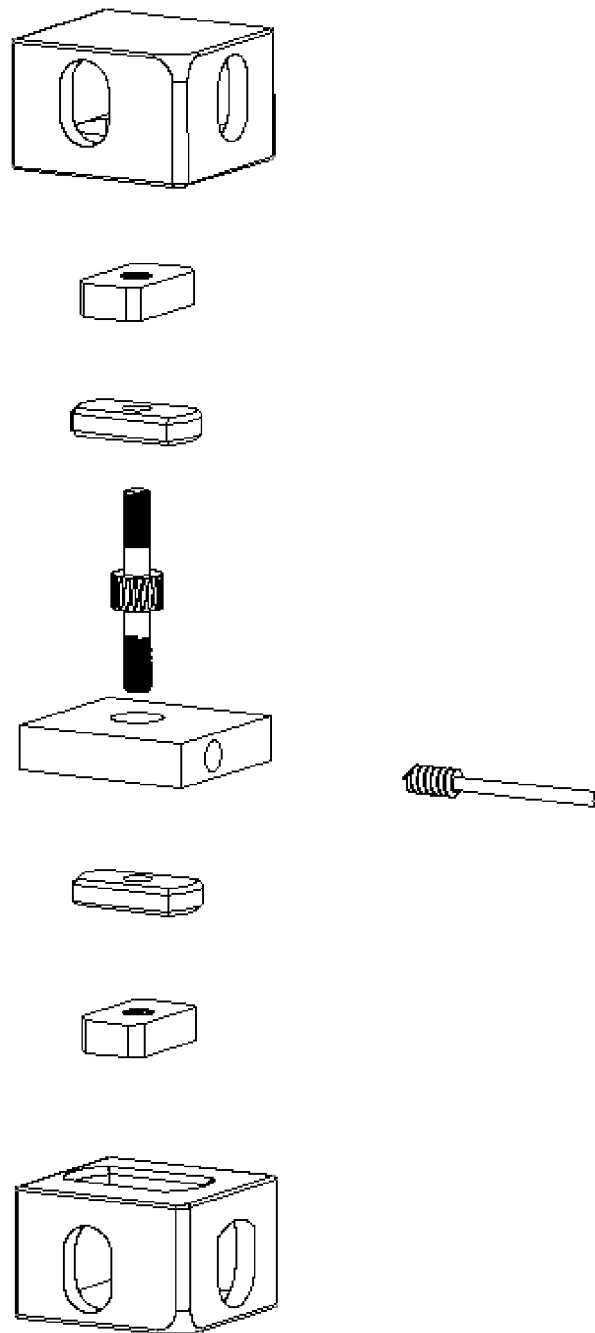


Figure 12

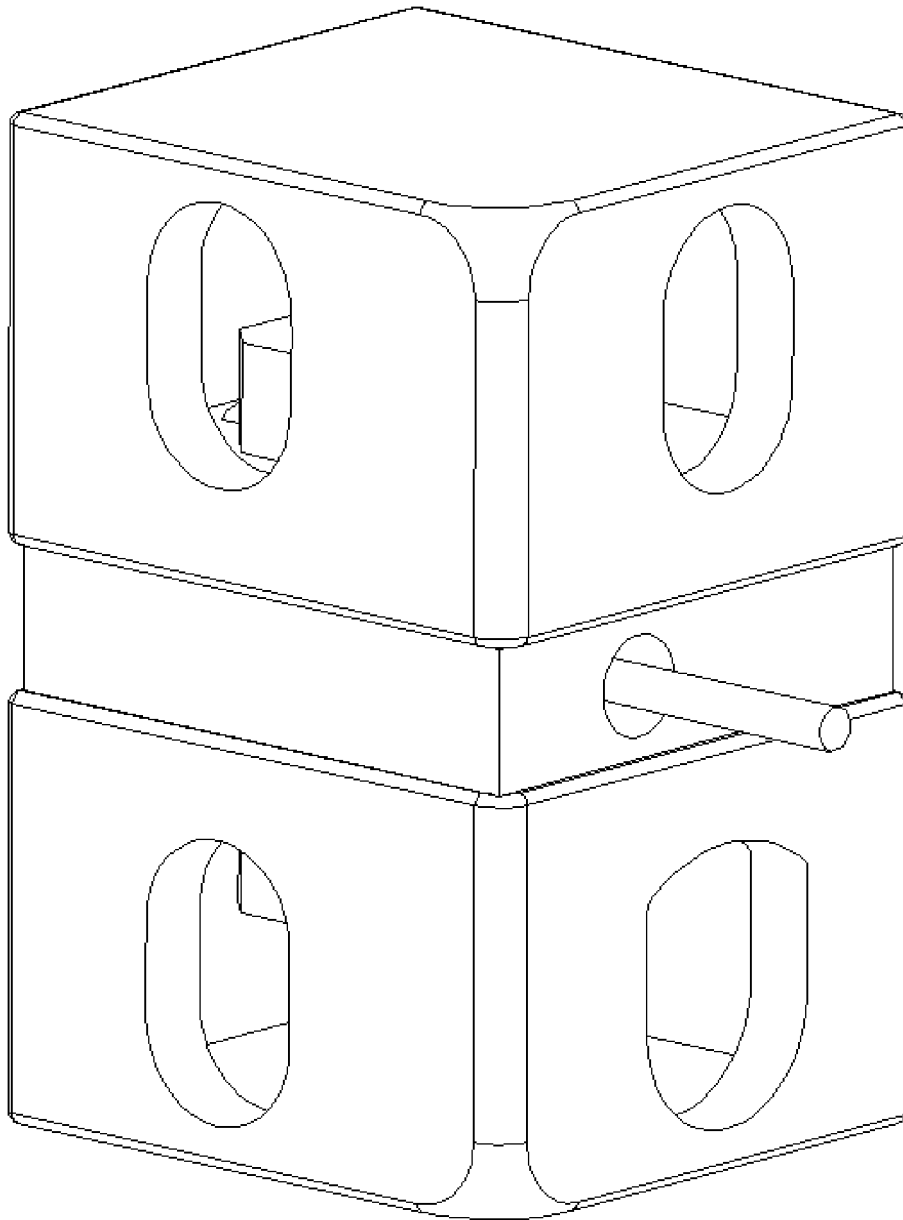


Figure 13

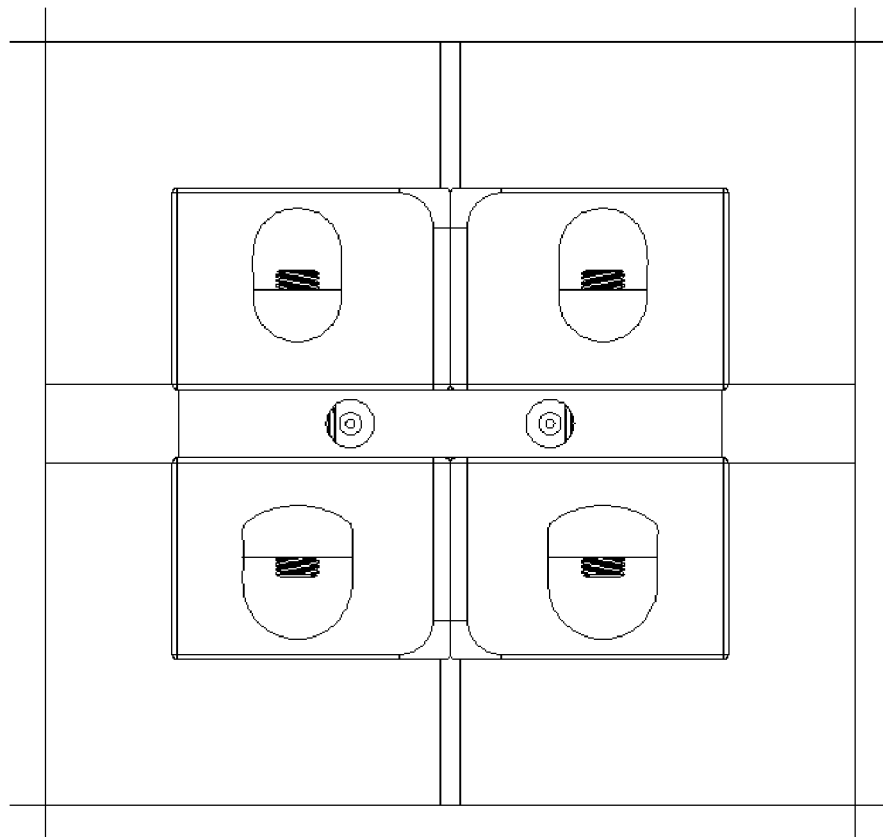


Figure 14

RELATÓRIO DE PESQUISA INTERNACIONAL

Depósito internacional Nº

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5	A. CLASSIFICAÇÃO DO OBJETO	
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	C. DOCUMENTOS CONSIDERADOS RELEVANTES	
20	Categoria*	Documentos citados, com indicação de partes relevantes, se apropriado
	A	AU 2010 100 432 A4 (FOLTAINER INTERNAT PTY LTD) 5 Agosto 2010 (2010-08-05) página 12, linha 10 - página 12, linha 21; figuras 26,27
25	A	GB 2 476 102 A (KEY HOUSING LTD [GB]) 15 Junho 2011 (2011-06-15) página 13, linha 7 - página 16, linha 21; figuras 5-7
30	A	US 2014/190964 A1 (SKEID EIRIK [NO]) 10 Julho 2014 (2014-07-10) parágrafo [0102]; figura 34
35	A	EP 2 275 361 A1 (KRAUSS MAFFEI WEGMANN GMBH & C [DE]) 19 Janeiro 2011 (2011-01-19) parágrafo [0035] - parágrafo [0041]; figuras 4-7
		Relevante para as reivindicações Nº
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 Informação relativa a membros da família da patentes

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Document de patente citados no relatório de pesquisa	data de publicação	Membro(s) da família de patentes	data de publicação
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