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(54) **Title:** REUSABLE SHIPPING BOX, IN PARTICULAR FOR THE TRANSPORT OF RETURNABLE PACKAGING

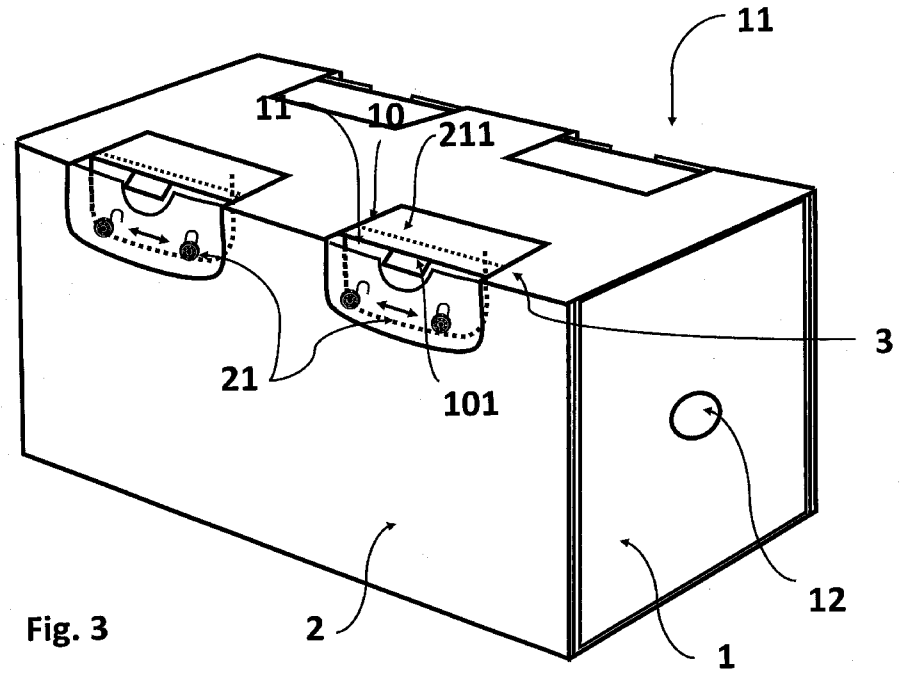

Fig. 3

(57) **Abstract:** A reusable shipping box, in particular for transporting returnable packaging, which comprises at least two parts, wherein the parts comprise at least one inner part (1) for storing the goods and an outer part (2) serving as a protective cover for insertable placing of the inner part (1), where the parts (1,2) are interconnected by at least one locking mechanism (3) to prevent the inner part (1) from falling out when inserted into the outer part (2), wherein this locking mechanism (3) comprises a combination of a protrusion (21) of the outer part and a pocket (11) of the inner part accessible via an opening (10) in the inner part, wherein, when the locking mechanism (3) is engaged, the parts (1,2) are secured against mutual movement by the protrusion (21) preventing the inner part (1) from shifting. Use of the shipping box for transporting containers and/or bottles intended for re-use, in particular those made of glass.

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Reusable shipping box, in particular for the transport of returnable packaging

Technical Field

This invention relates to a reusable shipping box, in particular formed of cardboard parts and comprising at least two parts, wherein one part forms an inner part for storing goods and where the other part forms an outer cover for holding the inner part, the parts being interconnected by a locking mechanism to prevent the inner part from falling out when inserted into the outer part, without the use of adhesive tape.

Background Art

Disposable cardboard boxes, mainly made of cardboard, are predominantly used for the transport of goods wrapped in their original packaging or stored separately. Their primary function is to protect the goods and usually also to protect the outer packaging in which the goods are placed.

The disadvantage of these boxes is the fact that they are not suitable for reuse, as the boxes are often damaged by tearing. At the same time, without the use of self-adhesive tape, the contents of the box cannot be safely secured against falling out.

The main problem is that a relatively large amount of adhesive tape must be used to secure the closure of the box. According to the calculations of the originators, the amount of adhesive tape used is approximately three times the sum of the dimensions of the box. For example, for a box with dimensions 30x20x15 cm, where the sum of these dimensions is 65 cm, approximately 195 cm of adhesive tape is used.

Another problem, as far as the current state of the art is concerned, is the lack of protection against external impacts as a standard cardboard box has no protection or deformation zones for shipping fragile goods, e.g., glasses and bottles. Therefore, the interior space must be additionally lined with other material, e.g., plastic padding, foam foil, bubble wrap, paper straw, etc.

Cardboard boxes serve for transporting a diverse range of goods. These are paper boxes for the production of which corrugated cardboard is used, which is created by gluing several layers of paper together. The number of layers of cardboard determines the strength and quality of the final boxes, protecting the goods from damage and moisture. Three-ply, five-ply and seven-ply corrugated board are the most commonly used products.

At present, a number of companies are involved in the manufacture and sale of cardboard boxes, which exist in a variety of sizes and for different purposes and are usually designed for single use.

Some entities on the market also offer shaped die-cut lock boxes as well as returnable boxes. One can also encounter offers to rent cardboard boxes. The reasons for reusing boxes are to reduce the production of disposable waste and the impact on the environment.

All returnable boxes or rental products and services relate mainly to larger sized removals boxes or wardrobe boxes. The lock boxes offered are complete with a lock cut-out, perforation, or other opening, but do not offer resealing of the box using this lock. The box can be resealed by means of self-adhesive tapes. In most cases, such adhesive tape is made of plastic with a synthetic adhesive.

There are known technical solutions relating to the combination of the inner and outer parts of the box to allow its easy opening and closing. This is document No. KR200440152Y1 „Packing box for small size commodity", No. US20200270052A1 „Nested insulated packaging", No. JP2009018870A „PACKAGING BOX" and No. JP6456103B2 „PACKAGING BOX".

Another document describing the state of the art which is in some respects similar is No. EP3587293A1 "FOLDING BOX", which also describes a locking device located on one of the walls of the folding box.

Document No. DE112009001801T5, identified as "PAPERBOARD BIN-CUBE", is a box with an outer and inner part with the possibility of partial sliding out.

There are also known to some extent similar technical solutions for boxes, namely No EP0549251A1 "Package, especially for printers", No. EP0941935A1 "Two-compartment carton for granular materials" and No. EP2248729A1 "Case-type packaging for bottles and/or flasks". These options offer solutions for more parts of the box.

A similar solution can be seen in three other documents found concerning boxes smaller in volume than the previous ones, which are used in the tobacco industry. However, their solution also includes an outer and inner part of the box as well as cut-outs used to secure the opening. These are No. DE112016000845T5 "SLIDE-OPEN PACKET OF SMOKE ARTICLES", No. EP3098176B1 "A PACKAGE FOR SMOKING ARTICLES" and No. WO2016138305A1 "CHILD-RESISTANT PACKAGE".

In addition, document No. JPH0811864A "PAPER-MADE HEAT INSULATING CASE" is also known, which also describes a composite box with an outer and an inner layer but intended mainly for improving thermal insulation efficiency for better storage.

The above-mentioned documents can be considered as the closest state of the art, as they are technical solutions comprising a package with two parts and a similar internal arrangement. These technical solutions also in some way present similar cut-out holes. At the same time, however, the box locking system is not innovatively designed in these documents.

Summary of the Invention

Products currently on the market do not provide a suitable solution for locking the box, especially cardboard boxes. They do not provide a special lock to prevent spontaneous opening.

The technical solution of the reusable shipping box described herein is arranged in such a way that it comprises at least two parts, wherein at least one part forms an inner part for storing the goods and where the other part forms an outer protective cover for holding the inner part, wherein these parts are interconnected by a locking mechanism to prevent the inner part falling out when inserted into the outer part.

Alternatively, more inner parts can be inserted into the outer part.

This locking mechanism consists in the formation of at least one pocket, accessible through an opening in the inner part, into which a protrusion of the outer part is inserted, thereby securing the parts against mutual movement as the protrusion prevents the inner part from shifting. The locking mechanism

thus requires the interaction of at least two elements, at least one of which is part of the inner part and at least one of which is part of the outer part.

In the case of a single inner part, the inner part is surrounded by the outer part on at least four sides, usually in such a manner that the inner part can be inserted into the outer part like a drawer. Placing the inner part into the outer part is therefore done by sliding, as can be seen, for example, in Fig. 3.

In an alternative embodiment, where the box comprises more than one inner part, the walls of the inner parts usually touch each other, making it unnecessary for each inner part to have so many walls in contact with the outer part, therefore, contact with the outer part on at least four sides is then achieved by these inner parts as a whole. The individual inner parts may also be separated by a partition.

In a preferred embodiment, the locking mechanism is formed in at least two locations, more preferably in four locations, wherein the greater the number of internal parts, the greater the number of locking joints desirable to secure these internal parts within the outer part.

It is further advantageous if this locking mechanism is formed on the same wall of the outer part from which the protrusions are inserted into the pockets formed in the side walls of the inner part, whereby this wall of the outer part advantageously covers the space for placing the goods in the inner part.

The pockets for inserting the protrusions of the outer part are preferably formed by making a hole in the double wall of the

inner part by folding the material of the outer part, as can be seen, for example, in Fig. 1

At the same time, the folding of the walls of the inner part provides additional protection for the goods, in that when the outer part is slid over the inner part, the goods are essentially protected by at least three layers of material.
Therefore, the disadvantage of the prior art is eliminated, since the shape of the material cut for the inner part, functionally expressed as a drawer, is designed in such a way that the cardboard is layered on the side walls and bottom and it is also advantageous to create a protective air zone in the front, back and top of the box, which is created by folding the material at the required spacing. Examples of die-cutting from a single piece of material to form the box parts are shown in Figs. 4 to 7. The folding of the individual parts occurs by the bending of the parts thereof, as indicated in these figures, which nevertheless serve as one particular detailed embodiment from which certain features may be further derived for the purpose of describing the shape of the individual parts of the box according to the present invention. However, these examples do not limit the scope of protection of alternative embodiments falling within the set of technical features embodied in the present invention. The expert will thus be able to create an alternative embodiment without any special effort. For this reason, the invention is expressed more generally, for example, by means of Figs. 1 to 3.

In a preferred embodiment, the wall of the inner part, which remains exposed after insertion into the outer part, comprises an opening for easy ejection of the part.

As an alternative, to increase the durability of the shipping box, the outer part and/or the inner part may be made of a stronger material, including different types of eco-plastics, or

preferably a combination of different materials which are sufficiently light and durable. For example, it is therefore advantageous if the outer part is coated with a layer of water-resistant material, e.g., by waxing, which can extend the lifetime of the box without significantly affecting its production costs and environmental burden. Even though cardboard is the preferred material, this solution is not limited to this material, as mentioned above.

As mentioned above, more preferably, the inner part and/or the outer part and/or the insertable part is formed from a single piece of die-cut material in which bends, or grooves and perforations are formed for subsequent folding into the desired shape of the box. For example, the protrusion of the outer part is formed by perforation and bending.

An exemplary embodiment is shown, for example, in Figs. 4 to 7.

The box can be used for storing any type of goods, but it has been found, for example, to be very useful for holding returnable packaging, especially used glass bottles and containers.

For this purpose, the box contains an inner part of the chamber for storing individual pieces of goods, such as the aforementioned bottles and containers, especially glass ones, which are separated from each other to prevent their mutual contact and possible damage. The chambers may be formed, for example, by inserting the insertable part shown in Fig. 7, which is preferably also formed from a single die-cut of material.

Therefore, the present invention also claims protection for the use of the present box in connection with this type of goods to extend the possibilities of waste-free management and reduce the

production of waste by using returnable packaging transported in a shipping box according to the present invention.

List of Figures

Fig. 1 shows an axonometric view of the inner part of the box with the pockets marked for inserting the protrusions of the outer part to form a locking joint and with the advantageous internal dimensioning of the space in the form of protection zones.

Fig. 2 shows an axonometric view of the inner part of the box according to Fig. 1, but without indicating the internal arrangement.

Fig. 3 shows an axonometric view of the inner part of the box according to Fig. 1, onto which the outer part is slid, and the locking mechanism is engaged.

Fig. 4 shows a view of the outer part in the form of a die-cut from a single piece of material, fitted with two protrusions of the locking mechanism to accommodate one inner part.

Fig. 5 represents a view of the outer part in the form of a die-cut from a single piece of material, fitted with four protrusions of the locking mechanism to accommodate the two inner parts.

Figure 6 provides a view of the inner part in the form of a die-cut from a single piece of material fitted with four holes of the locking mechanism to form a locking joint.

Figure 7 is a view of an additional part of the inner part in the form of a die-cut from a single piece of material to form chambers for the safe storage of goods.

Examples of the Embodiments

Example 1

The shipping box consists of two parts, wherein the first part forms an inner part 1 for storing goods and where the second part forms an outer part 2 serving as a protective cover for holding the inner part 1, wherein these parts 1, 2 are interconnected by a locking mechanism 3 to prevent falling out of the inner part 1 inserted into the outer part 2. This locking mechanism 3 consists in a combination of a protrusion 21 of the outer part and a pocket 11 of the inner part, accessible through an opening 10 in the inner part, and when the locking mechanism 3 is engaged, the parts 1,2 are secured against mutual movement as the protrusion 21 prevents the inner part 1 from shifting. In this embodiment, the inner part 1 comprises four openings 10 in the side opposite walls in which pockets 11 are formed.
In this embodiment, the outer part 2 surrounds the inner part 1 on five sides, with the inner part 1 sliding into the outer part 2 substantially like a drawer.

Example 2

A shipping box according to Example 1, but carried out with the difference that, for easy ejection from the outer part 2, the inner part 1 is provided preferably with an opening 12.

Example 3

A shipping box according to any of the previous examples, but made with the difference that for easy ejection of the protrusion 21 from the pocket 11, a handling element 21 is formed on the protrusion 211 and/or the opening 10 comprises a recess 101 on the wall of the inner part.

Example 4

A shipping box according to any of the preceding examples but made with the difference that the outer part 2 comprises two inner parts 1 placed side by side.

Example 5

A shipping box according to any of the preceding examples, but made in accordance with Figs. 1 to 3, wherein the inner part comprises protection zones 13 formed by an air gap or cushioning between the outer wall and the inner wall of the inner part 1.

Example 6

A shipping box according to any one of the preceding examples, wherein the walls of the inner part 1 are formed of at least three layers.

Example 7

A shipping box according to any one of the preceding examples, wherein the inner part 1 comprises chambers for storing individual pieces of goods, wherein the chambers are formed by the insertable part 4.

Example 8

A shipping box according to any one of the preceding examples, wherein the inner part 1 and the outer part 2 and the insertable part 4 are formed from a single die-cut of material provided with grooves and perforations to subsequently achieve the desired shape.

Example 9

A shipping box according to any one of the preceding examples, wherein the inner part 1 and/or the outer part 2 and/or the insertable part 4 are made of cardboard and/or plastic and/or a combination of these materials, and wherein the outer part 2 is

made of cardboard, the cardboard preferably being additionally coated with a layer of water-resistant material, e.g., by waxing.

Example 10

A shipping box according to Examples 7 to 9, comprising chambers for containers and bottles intended for re-use.

Industrial Utilization

This invention is industrially applicable as an ecological and economic alternative to the existing method of goods packaging, the aim of which is to reduce the overall environmental burden of transporting goods by maximizing the use of existing resources by reusing them.

List of Reference Marks

1 - inner part
10 - opening
101 - recess
11 - pocket
12 - opening
13 - protective zone
2 - outer part
21 - protrusion
211 - handling element
3 - locking mechanism
4 - insertable part

Claims

1. A reusable shipping box, in particular for transporting returnable packaging, **characterized in that** it comprises at least two parts, wherein the parts comprise at least one inner part (1) for storing the goods and an outer part (2) serving as a protective cover for insertable placing of the inner part (1), where the parts (1,2) are interconnected by at least one locking mechanism (3) to prevent the inner part (1) from falling out when inserted into the outer part (2), wherein this locking mechanism (3) consists in a combination of a protrusion (21) of the outer part and a pocket (11) of the inner part accessible via an opening (10) in the inner part, wherein, when the locking mechanism (3) is engaged, the parts (1,2) are secured against mutual movement by the protrusion (21) preventing the inner part (1) from shifting.

2. A shipping box according to claim 1, **characterized in that** the interlocking joints (3) are formed in opposite walls of the box.

3. A shipping box according to claim 1 or 2, **characterized in that** for easy ejection from the outer part (2), the inner part (1) is preferably provided with an opening (12).

4. A shipping box according to any one of claims 1 to 3, **characterized in that,** for easy ejection of the protrusion (21) from the pocket (11), a handling element (211) is formed on the protrusion (21) and/or the opening (10) comprises a recess (101) on a wall of the inner part.

5. A shipping box according to any one of claims 1 to 4, **characterized in that** the outer part (2) comprises at least two inner parts (1) placed side by side.

6. A shipping box according to any one of claims 1 to 5, **characterized in that** the inner part comprises protective zones (13) formed by an air gap and/or cushioning between the outer wall and inner wall of the inner part (1).

7. A shipping box according to any one of claims 1 to 6, **characterized in that** the walls of the inner part (1) are formed of at least three layers of material.

8. A shipping box according to any one of claims 1 to 7, **characterized in that** the inner part (1) comprises chambers for storing individual pieces of goods, wherein these chambers are formed by the insertable part (4).

9. A shipping box according to any one of claims 1 to 8, **characterized in that** the inner part (1) and/or the outer part (2) and/or the insertable part (4) is formed from a single die-cut piece of material provided with grooves and perforations to subsequently achieve the desired shape.

10. A shipping box according to any one of claims 1 to 9, **characterized in that** the inner part (1) and/or the outer part (2) and/or the insertable part (4) are made of cardboard and/or plastic and/or a combination of these materials.

11. A shipping box according to claim 10, **characterized in that** the outer part (2) made of cardboard is coated with a layer of waterproof material, in particular by waxing.

12. A shipping box according to any one of claims 8 to 11, **characterized in that** it contains, in its chambers, containers and/or bottles intended for reuse.

13. Use of the shipping box according to any one of claims 1 to 12 for transporting containers and/or bottles intended for re-use, in particular those made of glass.

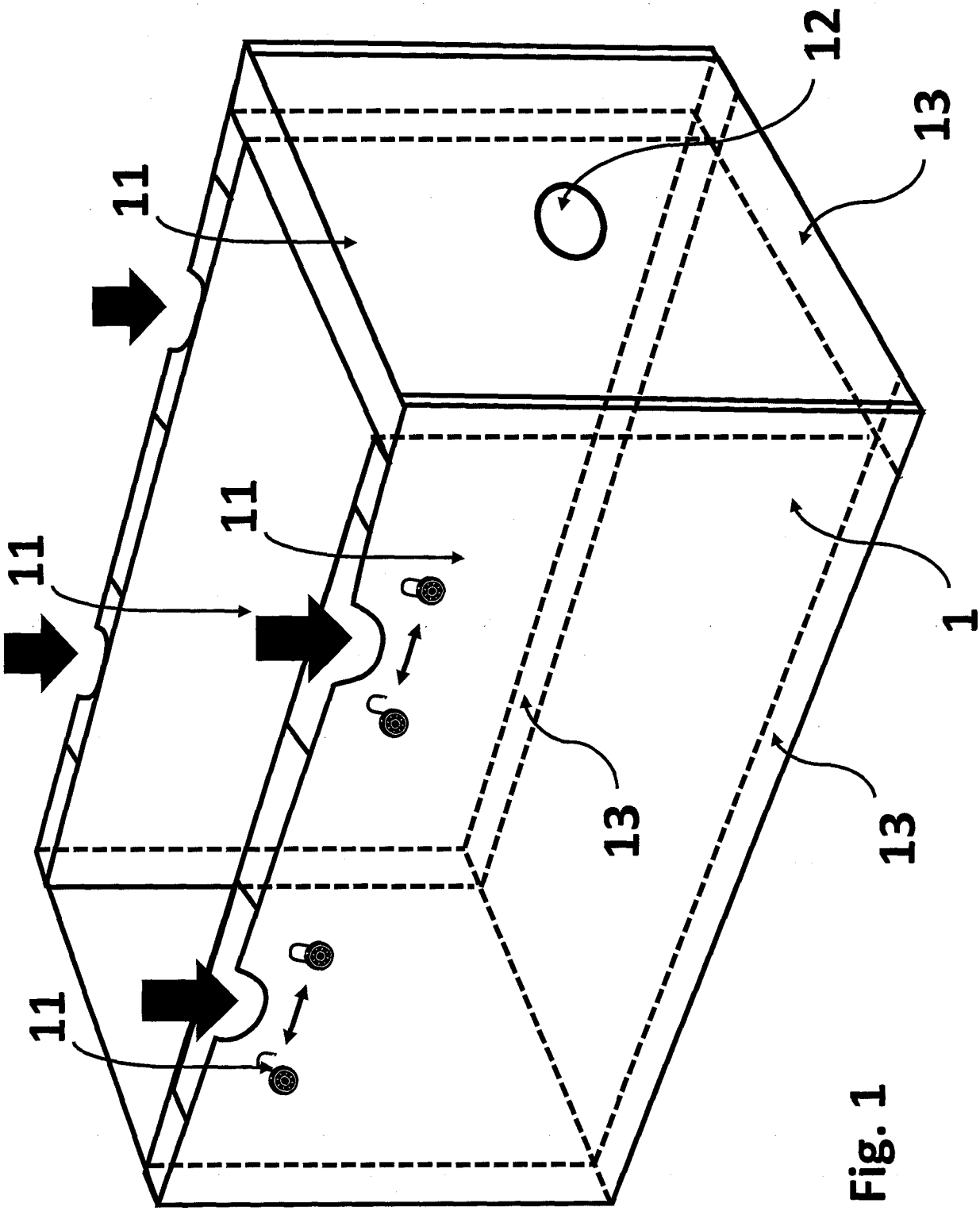

Fig. 1

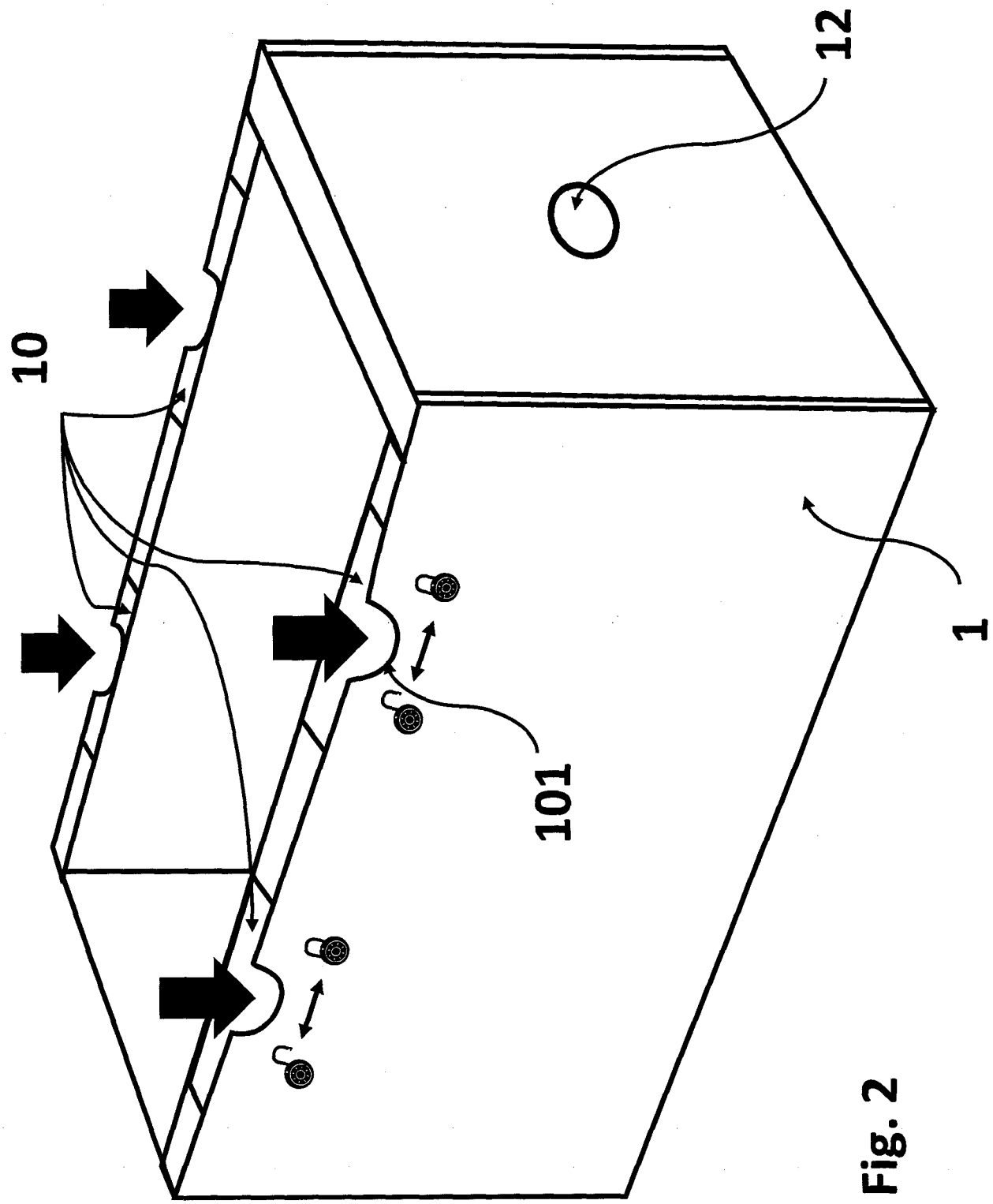

Fig. 2

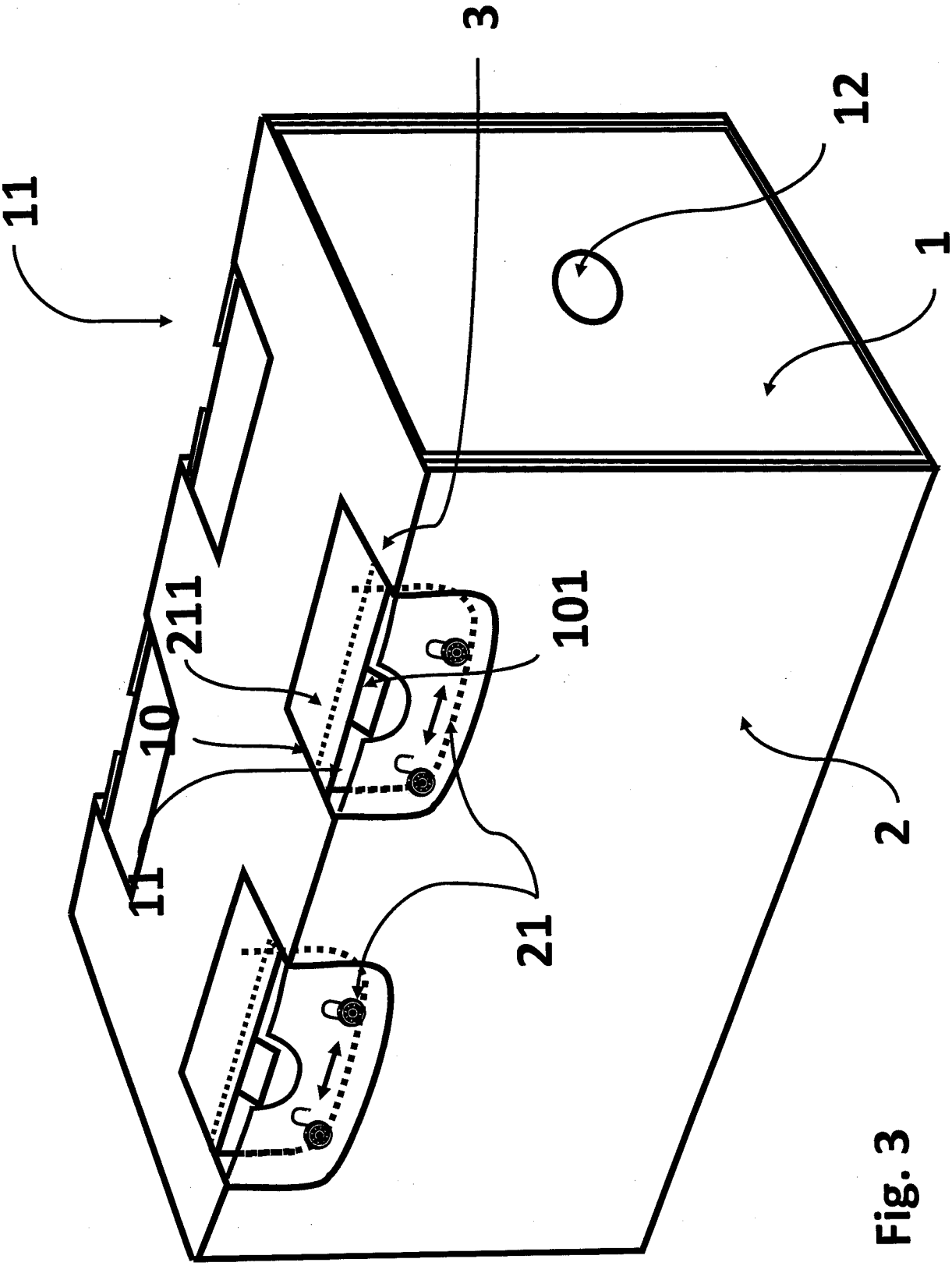

Fig. 3

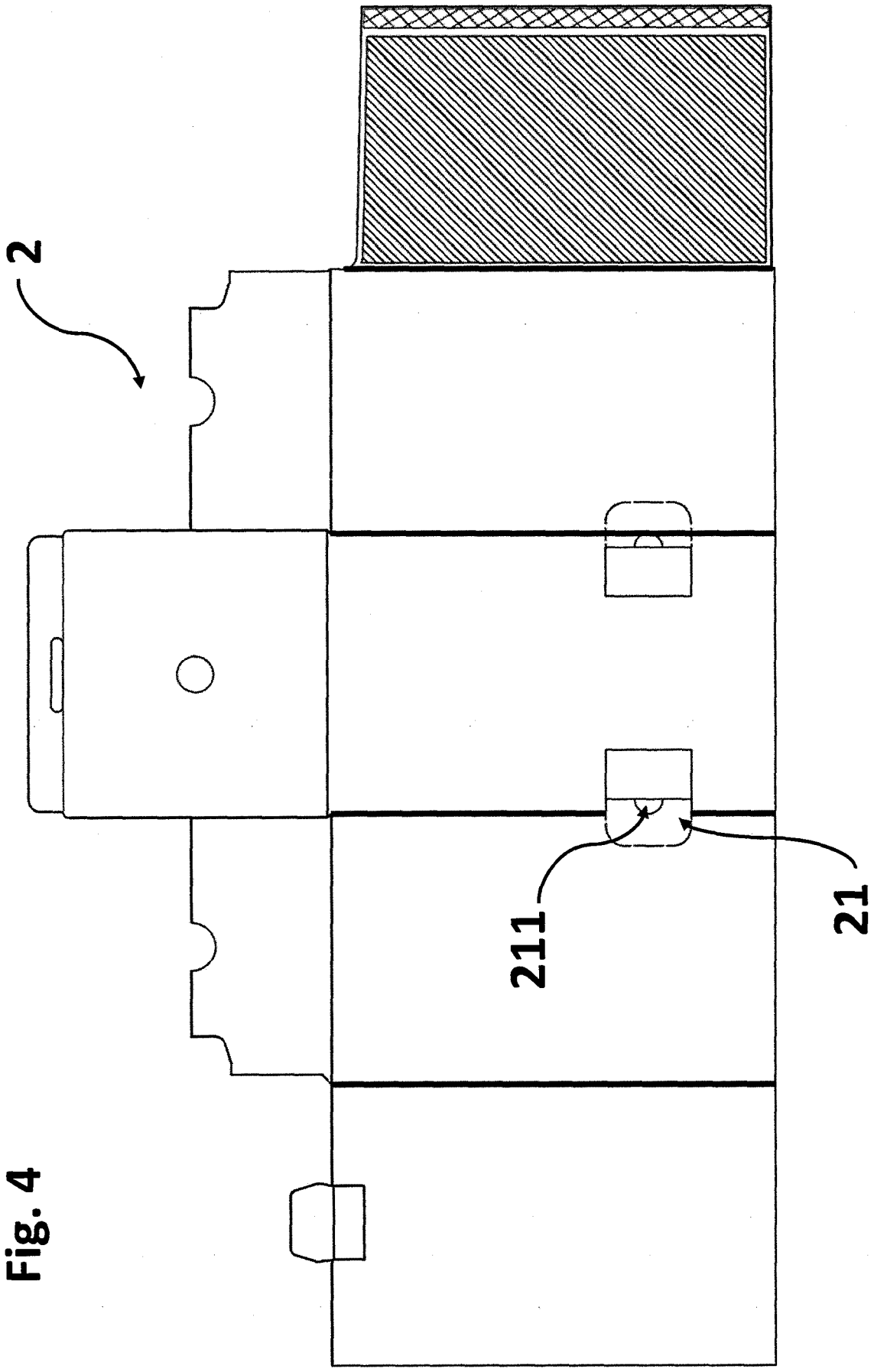

Fig. 4

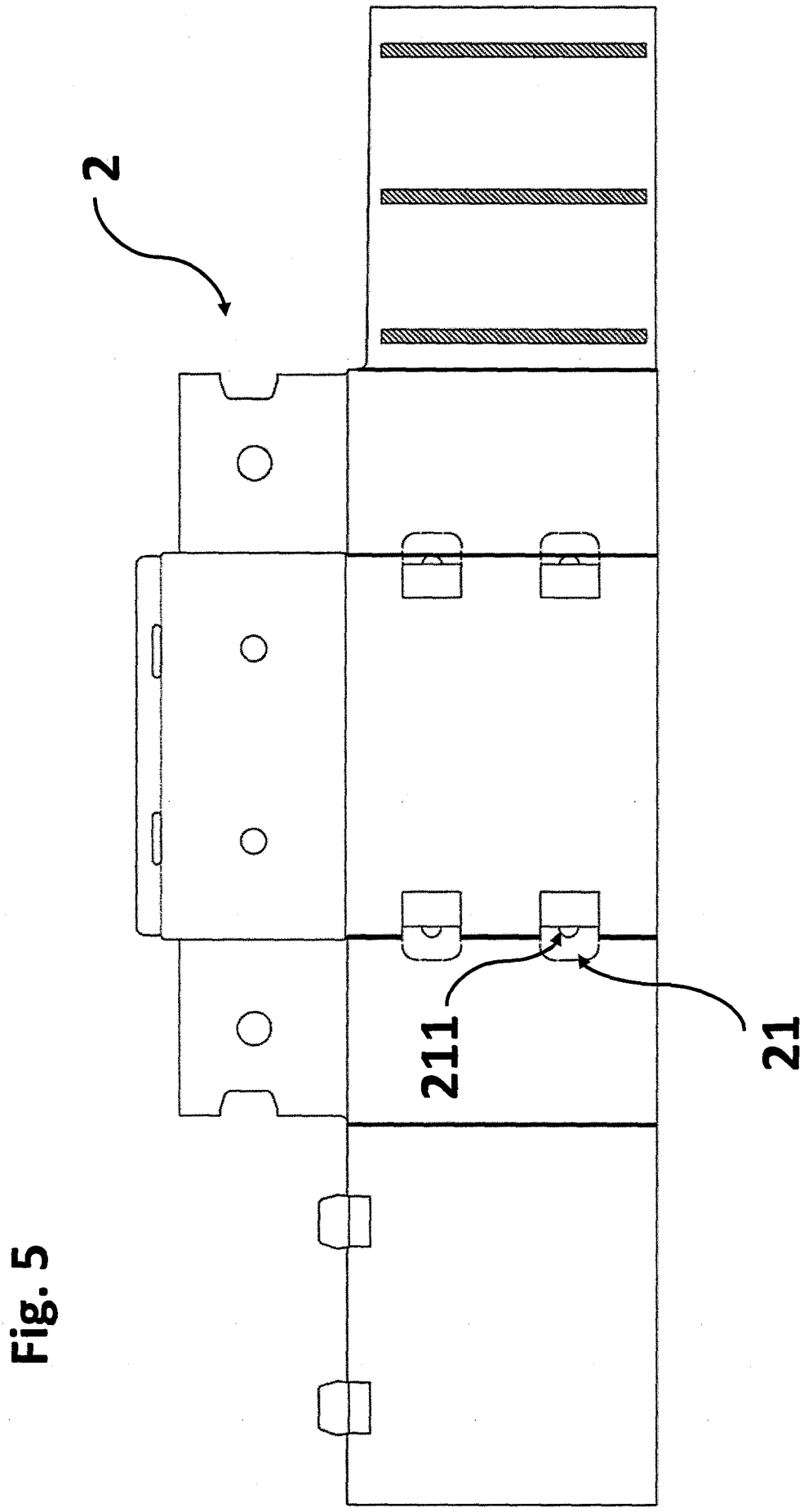

Fig. 5

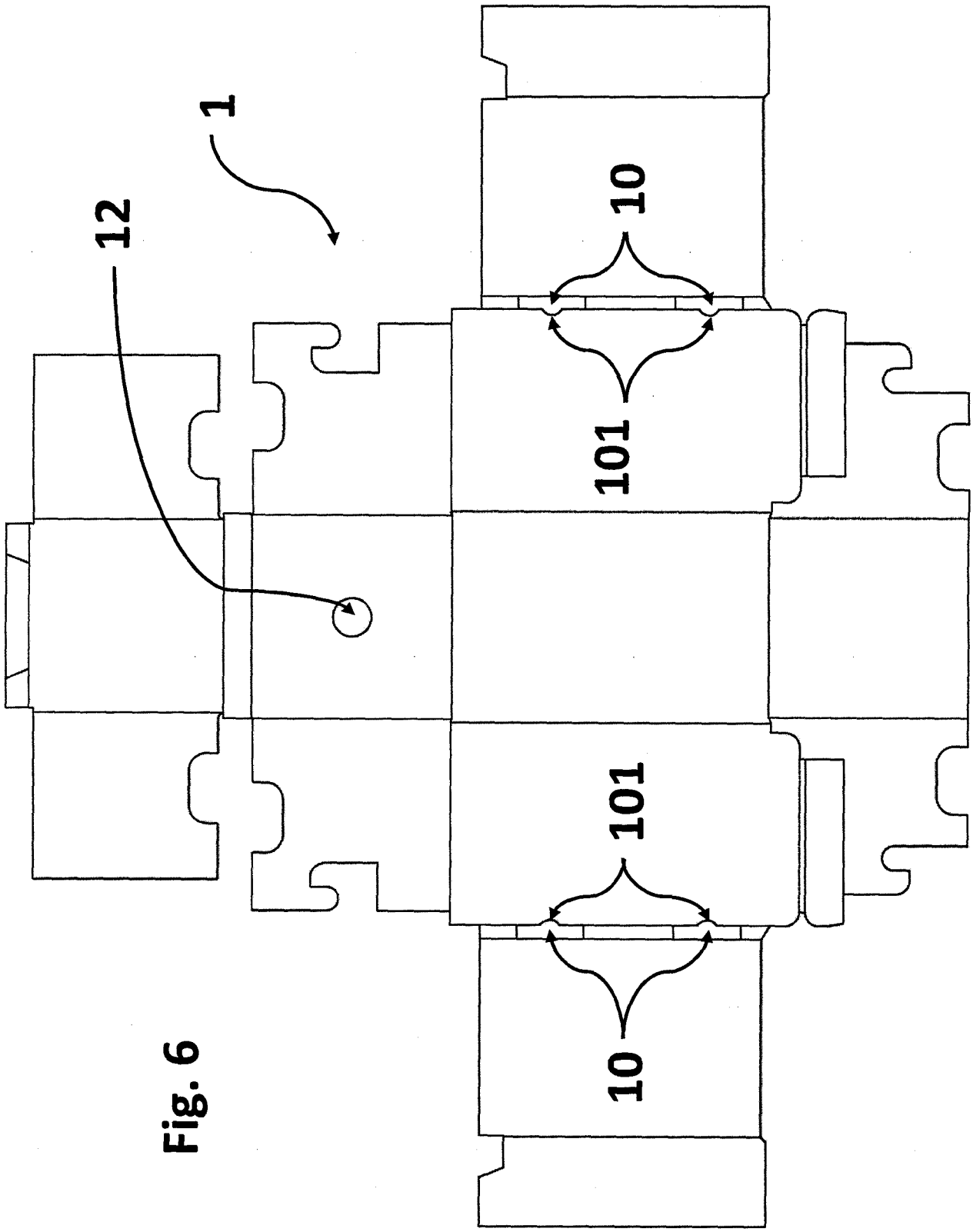

Fig. 6

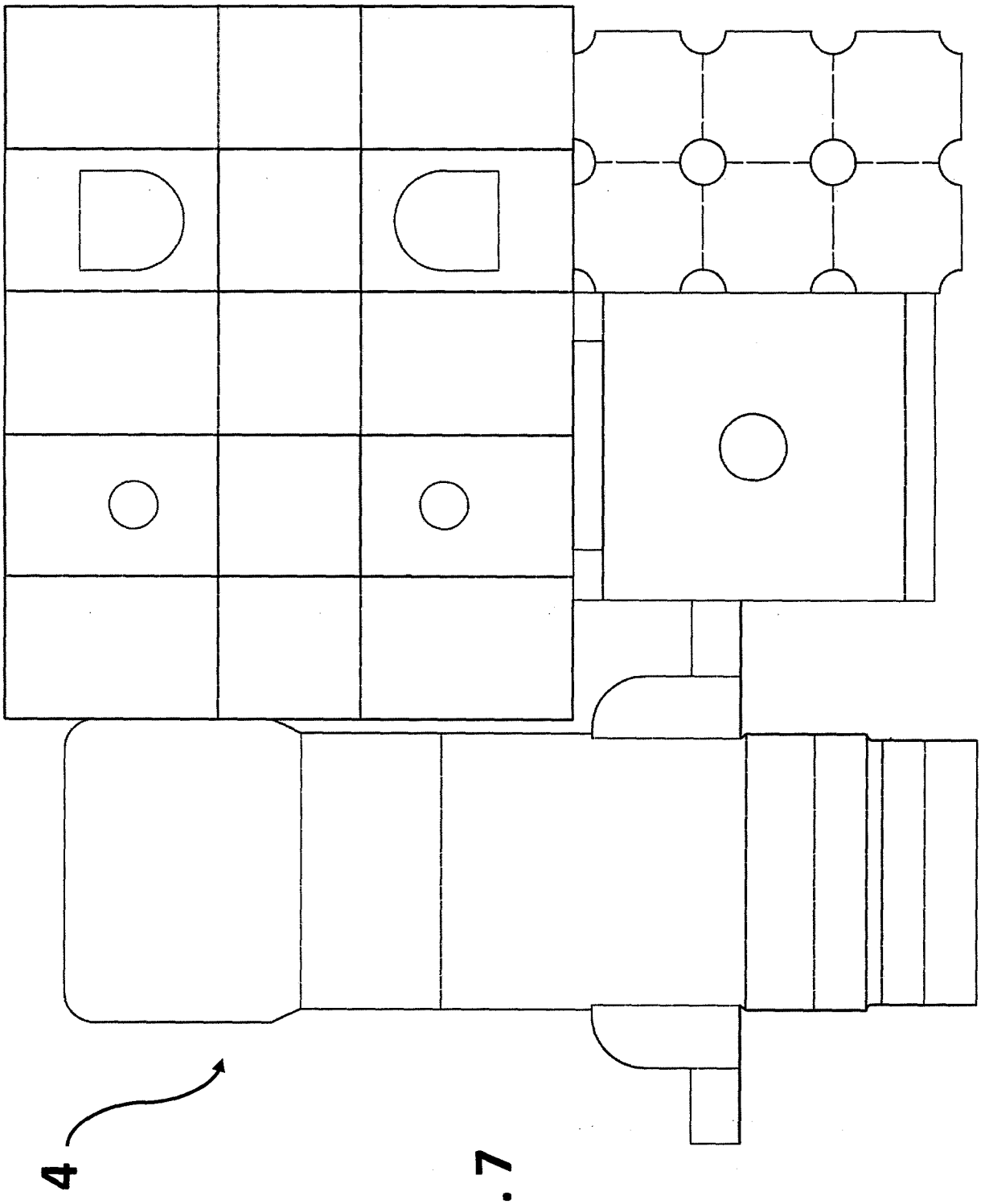

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/CZ2022/000006

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D5/38 B65D5/49 B65D85/30
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	EP 0 053 593 A1 (ANJOU GUNNAR) 9 June 1982 (1982-06-09) figure 7	1,2,6,9,10
X	FR 2 617 141 A1 (LYS ONDULYS CARTONNERIES [FR]) 30 December 1988 (1988-12-30) figures 3, 7, 8	1,2,8-10,12,13
Y	US 2009/302097 A1 (VINCENT RICHARD A [US]) 10 December 2009 (2009-12-10) figure 1	3,5

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
30 May 2022	10/06/2022

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
PCT/CZ2022/000006

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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