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(54) **FOLDING CASE WITH PROTECTED LOCKING MECHANISM**

FALTSCHACHTEL MIT GESCHÜTZTEM VERRIEGELUNGSMECHANISMUS

BOÎTE PLIANTE AVEC MÉCANISME DE VERROUILLAGE PROTÉGÉ

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Description

Subject of the Invention

[0001] The invention relates to a folding case that contains pieces, which prevent the case's collapsing when the locking system is subjected to excessive loads and/or the mechanism is exposed to impact, and that is not deformed even after prolonged use.

State of the Art

[0002] Cases with a plastic structure are used commonly in daily life. These cases are grouped into two as fixed structured cases and folding cases. The long and short sides of fixed cases cannot be detached from each other. These cases, which are considered more durable, are very hard to stack and they take up too much space. For these reasons, folding cases have been receiving increasing interest. In folding cases, generally the two short sides lock into position in the gaps between the two long sides and form a rectangular case when the long sides are in the open position. Locking mechanisms have been developed to prevent the collapsing of the cases when in use. These locking mechanisms fix the sides of the folding case in place. However, folding cases that contain a locking mechanism can still be collapsed when in use due to excessive loads, leading to spillage of their contents. In addition, the locking mechanisms of these cases can be subjected to impacts during stacking and transportation, which disable them and lead to the collapsing of the case.

[0003] Patent application no. 2005/02815 is a representative example of the state of the art. This application describes a locking mechanism that is fixed in position when the cases are opened. This locking mechanism is indicated to function by the sliding in place of a piece on the long side into a wedge on the short side. When the cases described here are subjected to excessive loads, the piece that has slid into place as part of the system can be dislocated and the case can be unintentionally collapsed. In such a situation the contents of the case can be spilled.

[0004] Another example for the state of the art is the patent no. KR 20140103420 A. Here the case is described to assume the open position when the short sides' are positioned on the threaded gaps located on the long sides with a locking system. However, this structure can be compromised if the case is exposed to impact. In the same way as above, the locking system can be disabled when heavy loads are carried in the case.

[0005] Patent no. WO01/47778 A1 is also an example for state of the art. The application describes a container. The container adapted for storing and transporting an item having a shape includes a flexible bottom panel which has an upper surface upon which the item is supported, and a lower surface having a plurality of parallel, spaced apart ribs with a relatively thin-walled section be-

tween each adjacent pair of ribs. The flexible bottom panel is adapted to conform to the shape of the item resting thereon. The container has a locking or latching system having a click fit mechanism which is not flexible. Besides it is possible that the locking system can be opened by a force applying from inner corner of the case.

[0006] In order to eliminate the adverse conditions described above, collapsible crates that have a locking mechanism, which would not be opened unintentionally even after prolonged use, is needed.

Detailed Description of the Invention

[0007] The invention refers to a folding case according to the features of claim 1. A folding case according to an embodiment of this application contains the following components: short side (2), long side (3), case holding recess (4), base (5), case safety pin (7), case safety pin housing (7a), male horizontal lock (8), case cover holder (9), centralizing pins (10), centralizing pin housings (10a), female lock housing (11), lock pockets (12), lock jacket beams (13), lock protection wall (14), load bearing column (15), safety housing (16), safety wall (17), male hinge (18), female hinge (19), hinge base profiles (20), female hinge housings (21) and stacking pin.

[0008] The folding case (1) that has a protected locking mechanism that is the subject matter of this application contains two short sides (2) and two long sides (3). When the folding case (1) is in the open position, these sides are located in a way to form a rectangular geometric structure. There are case holding recesses (4) on the short sides (2) and long sides (3). The folding case (1) can be lifted and carried by holding from these case holding recesses (4). There is a locking system at the intersection of the long sides (3) and short sides (2). The locking system is activated when the long sides (3) and short sides (2) are moved to the open position to attach the sides to each other. Said locking system structure includes lock pockets (12), female lock housing (11), centralizing pins (10), lock jacket beams (13), male horizontal lock (8), and centralizing pin housings (10a). When the folding case (1) is being brought to the open position, lock pockets (12), the female lock housing (11) that is between the two lock pockets (12), and the centralizing pin (10) below the lock pocket (12) which is positioned under the female lock housing (11) are on the upper side part of the side that opens first. On the upper side part of the side that opens after this side are the lock jacket beam (13), the male horizontal lock (8) that is positioned between preferably two lock jacket beams (13) and that slides into the female lock housing (11), and the centralizing pin housing (10a) that is positioned below the male horizontal lock (8) and in which the centralizing pin (10) slides.

[0009] On the upper side part of the long side (3) are the lock pockets (12), female lock housing (11), and centralizing pins (10). The lock pockets (12), which there are preferably two of, are positioned to be under one another

and with a little gap between the two. The empty space between the lock pockets (12) is referred to as female lock housing (11). Below the lower lock pocket (12) are a little more of a gap and then a centralization pin (10). The centralization pins (10), which there are preferably two of, are positioned to be under one another and with a little gap between the two. Stated differently, on the upper side part of the long side (3) are, in respective order and having gaps in between them, preferably two lock pockets (12), in the gap between these lock pockets (12) a female lock housing (11) and preferably two centralization pins (10).

[0010] On the upper side part of the short side (2) is a lock jacket beam (13). Between these lock jacket beams (13), which there are preferably two of, is a male horizontal lock (8). This male horizontal lock (8) slides into the female lock housing (11) that is on the long side (3) when the short side (2) and long side (3) are brought to the open position. On the lower part of the lock jacket beam (13) that is located under the male horizontal lock (8) are preferably two centralizing pin housings (10a) that correspond to the two centralizing pins (10) that are on the long side (3). Stated differently, on the upper part of the short side (2) are, in respective order and having gaps in between them, preferably two lock jacket beams (13), the male horizontal lock (8) that is located in the gap between these two lock jacket beams (13), and preferably two centralizing pin housings (10a). In the section between the lower one of the two lock jacket beams (13) on the short side (2) and the lower one of the centralizing pin housings (10a) is the load bearing column (15). This load bearing column (15) prevents the locking system to be exposed to load and thus from being damaged.

[0011] While the long side (3) is in the open position, when the short side (2) is opened, the centralizing pins (10) slide into the centralizing pin housings (10a). At the same time, the male horizontal lock (8) slides into the female lock housing (11). Thus, the short side (2) and the long side (3) become affixed to each other.

[0012] There is a lock protection wall (14) that covers the side of the long side (3) like a curtain. This lock protection wall (14) protects the lock system from impacts. Thus the lock system is prevented from being deformed when the case is exposed to impact or is subjected to heavy loads.

[0013] On sides of the base (5) of the collapsible crate (1) are hinge base profile (20) with female hinge housings (21) on it. Male hinges (18) on the short sides (2) and the lower parts of the long sides (3) are located such that they would be corresponding to the female hinge housings (21) on the hinge base profile (20). Male hinges (18) are shaped such that they can grasp the female hinges (19) and they would allow for the demounting of them from the hinge base profile (20) when needed. There are female hinge housings (21) on female hinges (19). These housings allow the male hinges (18) to move freely. Further, female hinge housings (21) ensure the free movement of male hinges (18) in female hinges (19) even if

burrs form due to prolonged use. On the hinge base profile (20) where the base (5) connects with the long side (3) are, having gaps in between them, preferably four female hinges (19). In the preferred embodiment of the invention in this form, there are preferably four male hinges (18) on the lower part of the long side (3). On the hinge base profile (20) where the base (5) connects with the short side (2) are, having gaps in between them, preferably three female hinges (19). In the preferred embodiment of the invention in this form, there are preferably three male hinges (18) on the lower part of the short side (2).

[0014] There is a safety wall (17) on the hinge base profile (20). This safety wall (17) prevents the long side (3) from opening beyond 90°, thereby preventing the hinges from being deformed. On the long side (3) is a safety housing (16) in which the safety wall (17) will slide in when the long side (3) is moved into the open position. Thus, the safety wall (17) is prevented from protruding outward from the case body and occupying additional space, thereby making the cases easier to stack.

[0015] There is a case cover holder (9) located at the corner formed by the lock protection walls (14) that are on the sides of the long sides (3) of the collapsible crate (1). When the case is covered, the cover is attached to this holder thereby preventing the cover from opening. Thus, the cover of the case cannot be opened unintentionally.

[0016] The case safety pin (7) is positioned on the top of the short side (2). When the collapsible crates (1) are stacked on top of each other, the case safety pin (7) on the lower case that fits into the case safety pin housing (7a) on the bottom short side (2) of the top case. This prevents the toppling of the stack of collapsible crates (1) in case of a jolt. These pins are located preferably on the top corners of the short sides (2).

[0017] The lock pockets (12) that are integral to the structure of the invention that is the subject matter of this application fix position of the male horizontal locks (8) in the female lock housing (11) thereby preventing it from moving when subjected to heavy loads or when exposed to impacts. This allows the lock to retain its strength even under prolonged usage. Besides, the load bearing column (15) that is on the short side (2) prevents subjecting the case to excessive loading. The lock protection walls (14) on the long side (3) that cover the locking system protects the locking system against exposure to external impacts.

[0018] The protective locking system that is integral to the structure of the invention that is the subject matter of the application protects the folding case (1) against impacts and prolongs its economic life. The lock pockets (12) in the locking system, the female lock housing (11) that is located between these pockets and the load bearing column (15) increase the durability of the lock system. In addition to these, the lock protection walls (14) that encase the locking system protect the locking system. The safety walls (17) on the long sides (3) prevent the

unintentional opening of the long sides (3) and making an angle larger than 90°. Thus, the male hinge (18) and the female hinge (19) that connect the long sides (3) to the base (5) are not deformed. In addition, deposition of burrs at the female hinge housings (21) on the female hinges (19) is prevented, to a large extent. Even if burrs form, it does not affect the movement of the hinges.

[0019] The folding case (1) that is the subject matter of this application has a protrusion (6) below its base (5). This protrusion (6) makes it easy to stack the cases. In the preferred embodiment of the invention, dimensions of the base (5) are preferably 40 X 30 cm. Thus, these cases can be stacked on cases with dimensions of 60 X 40 cm. That is, two cases with dimensions of 40 X 30 cm can be stacked on top of a case with dimensions of 60 X 40 cm.

[0020] In sum, the invention is about a folding case (1) that contains a base (5), long sides (3) and short sides (2); and a female hinge (19) and a male hinge (18) that connect the base (5) to these sides; such that it contains a locking system located at the intersection of the short side (2) and the long side (3); a load bearing column (15) that decreases the load that this locking system is subjected to; a lock protection wall (14) that encases the locking system and protects it from external influences; female hinge housings (21) that are located on the female hinges (19) and protect the collapsible crate (1) from being deformed due to prolonged usage; a safety wall (17) that prevents the side that is being opened during the locking procedure from being pushed too far back; a safety housing (16) in which this safety wall (17) fits when the side that is opened is being fully opened; and a protrusion (6) at the bottom of the base (5) that allows for easy stacking of the cases on top of each other.

Explanation of Figures

[0021]

- Figure 1:** View of the folding case from front
Figure 2: View of the folding case from below
Figure 3: View of the locking system from the front
Figure 4: Internal view of the short side
Figure 5: External view of the short side
Figure 6: Internal view of the long side
Figure 7: External view of the long side
Figure 8: View of the base of the folding case from the front
Figure 9: Close-up view of the base of the folding case

References

[0022]

1. Folding case
2. Short side
3. Long side

4. Case holding recess
5. Base
6. Protrusion
7. Case safety pin
- 5 7a. Case safety pin housing
8. Male horizontal lock
9. Case cover holder
10. Centralizing pin
- 10a. Centralizing pin housing
- 10 11. Female lock housing
12. Lock pockets
13. Lock jacket beams
14. Lock protection wall
15. Load bearing column
- 15 16. Safety housing
17. Safety wall
18. Male hinge
19. Female hinge
20. Hinge base profile
- 20 21. Female hinge housing

Claims

- 25 1. A folding case (1), that contains:
 - two short sides (2),
 - two long sides (3),
 - a base (5),
 - 30 hinge base profiles (20) on the sides of the base (5), with female hinge housings (21) located on them, over female hinges (19),
 - male hinges (18) located on the lower part of the short sides (2) and long sides (3), corresponding to the female hinge housings (21), such that the female hinges (19) and the male hinges (18) connect the base (5) to the long sides (3) and to the short sides (2),
 - 35 a safety wall (17) located on the hinge base profile (20),
 - a safety housing (16) located on a long side (3) and in which the safety wall (17) slides,
 - a protrusion (6) located at the bottom of the base (5) that facilitates easy stacking,
 - 40 a locking system located at the intersection of a short side (2) and a long side (3), where the locking system comprises centralizing pins (10) and corresponding centralizing pin housings (10a),
 - lock pockets (12) on the upper lateral part of the long side (3), a female lock housing (11) located between the lock pockets (12), lock jacket beams (13) located on the upper lateral part of the short side (2), a male horizontal lock (8) located between the lock jacket beams (13), which slides into the female lock housing (11),
 - 45 wherein the folding case (1) further contains a load bearing column (15) located on a short side (2) and decreasing the load that the locking sys-
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tem is exposed to,
 wherein the folding case comprises a lock protection wall (14) located on the sides of the long sides (3) and covering them like a curtain, where the lock protection wall (14) encases the locking system and protects it from collapsing under heavy loads, namely from being deformed when the case is subjected to heavy loads.

2. The folding case (1) according to claim 1, **characterized by** comprising:

- case cover holders (9) that are located at the corners formed by the lock protection walls (14) next to the long side (3), and that prevent a cover from being opened when the case is covered,
- case pins (7) that are located on the upper part of the short side (2) and case safety pin housing (7a), in which the case safety pins (7) fit and thus prevent stacked cases from being toppled over,
- hinge base profile (20) that is mounted on the base (5) and that contains female hinges (19) on it,
- a case holding recess (4) that is located on the short sides (2) and the long sides (3), and that allows for the case to be carried.

3. The folding case (1) according to claim 1, **characterized by** comprising:

- two centralizing pins (10),
- two centralizing pin housings (10a) in which the centralizing pins (10) fit during the locking process.

4. The folding case (1) according to claim 3, **characterized by**
 the load bearing column (15) being located between the lower one of the centralizing pin housings (10a) and the lower one of the lock jacket beams (13), which are located on the short sides (2).

Patentansprüche

1. Ein zusammenfaltbarer Behälter (1) mit

- zwei kurze Seiten (2),
- zwei lange Seiten (3),
- einem Boden (5),
- Scharnierbasisprofilen (20) an den Seiten des Bodens (5) mit weiblichen Scharniergehäusen (21), die über weiblichen Scharnieren (19) auf ihnen ausgebildet sind,
- männlichen Scharnieren (18), die sich im unteren Bereich der kurzen Seiten (2) und der langen Seiten (3) befinden, die den weiblichen Scharniergehäusen (21) entsprechen, so dass die

weiblichen Scharniere (19) und die männlichen Scharniere (18) den Boden (5) mit den langen Seiten (3) und mit den kurzen Seiten (2) verbinden,

einer Sicherungswand (17), die sich auf dem Scharnierbasisprofil (20) befindet, einer Sicherungsaussparung (16), die sich an einer langen Seite (3) befindet und in die die Sicherungswand (17) gleitet, einem Vorsprung (6), der sich an dem Boden (5) befindet und der ein einfaches Stapeln ermöglicht;

einem Verriegelungssystem, das sich am Schnittpunkt einer kurzen Seite (2) und einer langen Seite (3) befindet, wobei das Verriegelungssystem Zentralisierungsstifte (10) und korrespondierende Zentralisierungsstift-Gehäuse (10a), Verriegelungstaschen (12) im oberen seitlichen Bereich der langen Seite (3), eine weibliche Verriegelungsaussparung (11), die sich zwischen den Verriegelungstaschen (12) befindet, Verriegelungsschutzbalken (13) im oberen seitlichen Bereich der kurzen Seite (2), eine männliche horizontale Verriegelung (8), die sich zwischen den in die weibliche Verriegelungsaussparung (11) gleitenden Verriegelungsschutzbalken (13) befindet, umfasst wobei der zusammenfaltbare Behälter (1) weiterhin eine lasttragende Säule (15) umfasst, die an einer kurzen Seite (2) angeordnet ist und die Last verringert, der das Verriegelungssystem ausgesetzt ist;

wobei der zusammenfaltbare Behälter an den Seiten der langen Seiten (3) eine Verriegelungsschutzwand (14) aufweist, die sie wie einen Vorhang abdeckt, wobei die Verriegelungsschutzwand (14) das Verriegelungssystem umschließt und vor dem Zusammenbrechen unter schweren Lasten schützt, und zwar davor, deformiert zu werden, wenn der Behälter schweren Lasten ausgesetzt ist.

2. Zusammenfaltbarer Behälter (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** er aufweist

Behälterdeckelhalter (9), die sich an den Ecken befinden, die von den Verriegelungsschutzwänden (14) neben den langen Seiten (3) gebildet werden, und die verhindern, dass sich ein Deckel öffnet, wenn der Behälter abgedeckt ist; Behälterstifte (7), die sich auf dem oberen Bereich der kurzen Seite (2) befinden, und Behältersicherungsstiftgehäuse (7a), in welche die Behältersicherungsstifte (7) passen und dadurch verhindern, dass gestapelte Behälter umgekippt werden; ein Gelenkbasisprofil (20), das an dem Boden (5) angebracht ist und das weibliche Gelenke

(19) darauf enthält;
 eine Gehäusealtaussparung (4), die sich auf
 den kurzen Seiten (2) und auf den langen Seiten
 (3) befindet und die es ermöglicht, den Behälter
 zu tragen;

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3. Zusammenfaltbarer Behälter (1) nach Anspruch 1,
dadurch gekennzeichnet, dass er aufweist:

zwei Zentralisierungsstifte (10);
 zwei korrespondierende Zentralisierungsstift-
 Gehäuse (10a), in welche die Zentralisierungsstifte
 (10) während des Verriegelungsvorgangs
 passen.

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4. Zusammenfaltbarer Behälter (1) nach Anspruch 3,
dadurch gekennzeichnet, dass
 sich die lasttragende Säule (15) zwischen dem unteren
 der Zentralisierungsstift-Gehäuse (10a) und
 dem unteren der Verriegelungsschutzbalken (13)
 befindet, die sich auf den kurzen Seiten (2) befinden.

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Revendications

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1. Caisse pliable (1) comprenant:

deux bords courts (2)
 deux bords longs (3)
 une embase (5)
 des fentes de charnière femelle (21) au-dessus
 des charnières femelles (19) et des profils d'em-
 base de charnière (20) sur les bords de l'embase
 (5),
 des charnières mâles (18) situées a la partie in-
 férieure des bords courts (2) et des bords longs
 (3) correspondant aux fentes des charnières fe-
 melles (21) de sorte que l'embase des charniè-
 res femelles (19) et des charnières mâles (18)
 se connecte aux bords longs (3) et aux bords
 courts (2),
 une paroi de sécurité (17) située au profil d'em-
 base de charnière (20),
 une fente de sécurité (16) située sur un bord
 long (3) et ou la paroi de sécurité (17) coulisse,
 une saillie (6) située sous l'embase (5),
 un système de verrouillage situé à l'intersection
 d'un bord court (2) et d'un bord long (3), le sys-
 tème de verrouillage comprenant des goupilles
 de centrage (10) et des fentes de goupilles de
 centrage (10a) correspondants, des poches de
 verrouillage (12) sur le côté supérieur du bord
 long (3), une fente de verrouillage femelle (11)
 située entre les poches de verrouillage (12), des
 poutres de protection (13) de verrouillage si-
 tuées sur le côté supérieur du bord court (2), un
 verrou horizontal mâle (8) situé entre les poutres
 (13) de protection de verrouillage coulissant

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dans la fente de verrouillage femelle (11);
 selon lequel la caisse pliable (1) comprend une
 colonne porteuse de charge (15) située sur un
 bord court (2) et réduisant la charge à laquelle
 le système de verrouillage est exposé,
 selon lequel la caisse pliable (1) comprend une
 paroi de protection de verrouillage (14) située
 sur les côtés des bords longs (3) et les recou-
 vrant comme un rideau, le paroi de protection
 de verrouillage (14) entourant le système de ver-
 rouillage et l'empêchant de s'effondrer sous de
 lourdes charges, c'est-à-dire de se déformer
 lorsque la caisse est soumise à de lourdes char-
 ges.

2. Caisse pliable (1) selon la revendication 1, **caracté-
 risée en ce qu'elle** comprend:

des poignées de couvercle de caisse (9) situées
 dans les coins formés par des parois de protec-
 tion de verrouillage (14) adjacentes au bord long
 (3) et empêchant l'ouverture d'un couvercle lors
 de la fermeture de la caisse,
 goupilles de sécurité de la caisse (7) situées sur
 la partie supérieure du bord court (2) et le loge-
 ment de goupille de sécurité de la caisse (7a)
 où les goupilles de sécurité de la caisse (7) re-
 posent et empêchent ainsi les caisses empilées
 de se renverser,
 profil d'embase de charnière (20) placé a l'em-
 base (5) et comportant des charnières femelles
 (19),
 un espace de maintien de caisse (4) situé sur le
 bord court (2) et sur le bord long (3) et qui permet
 de transporter la caisse.

3. Caisse pliable (1) selon la revendication 1, **caracté-
 risée en ce qu'elle** comprend:

deux goupilles de centrage (10);
 deux fentes de goupilles de centrage (10a) sur
 lesquelles les goupilles de centrage (10) sont
 assises lors du processus de verrouillage.

4. Caisse pliable (1) selon la revendication 3, **caracté-
 risée en ce qu'elle** comprend une colonne porteuse
 (15) est située sous la partie entre les poutres de
 protection de verrou inférieures (13) situées sur le
 bord court latéral (2) et celles qui se situent en des-
 sous des fentes (10a) de goupilles de centrage.

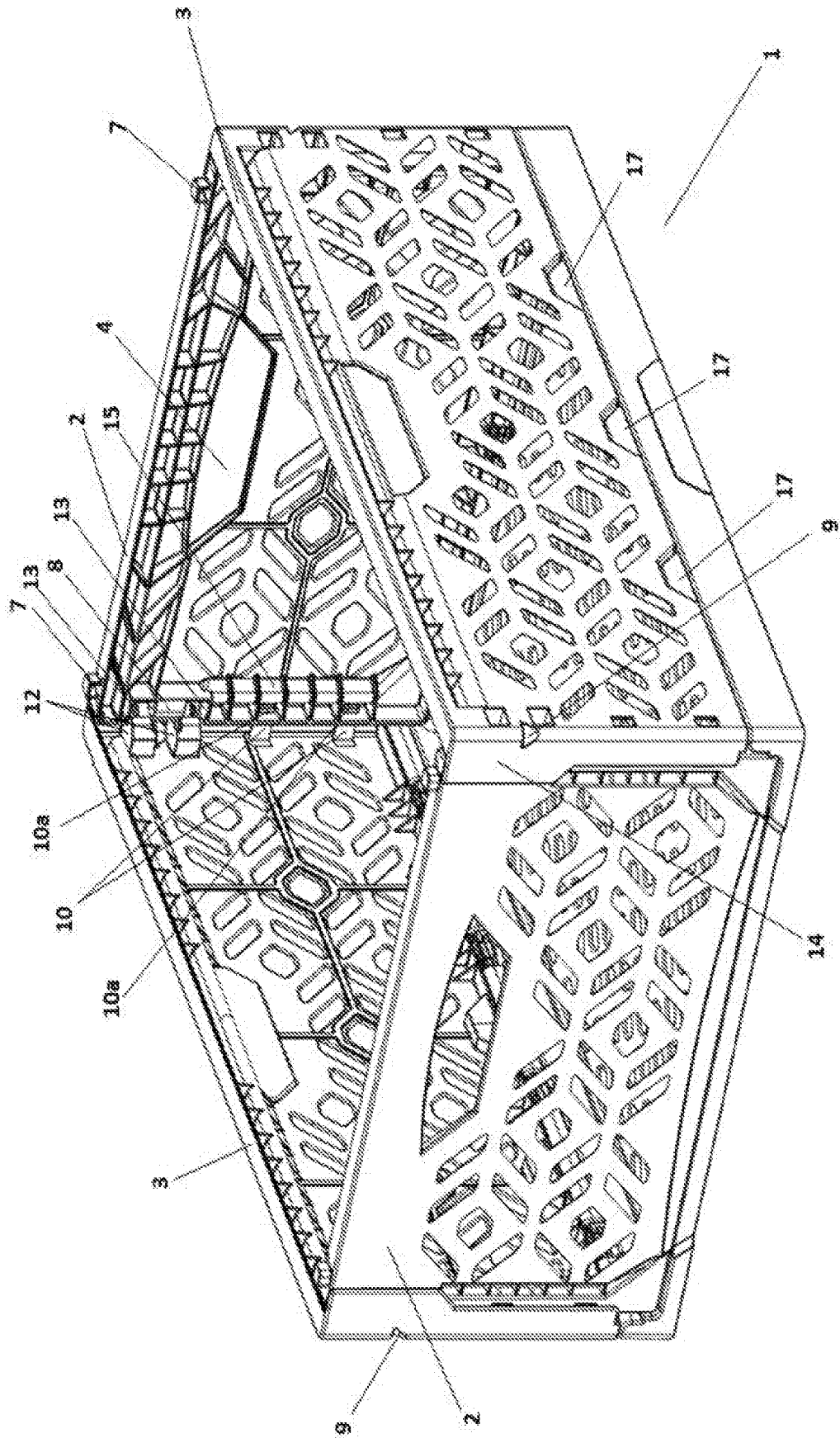


Figure 1

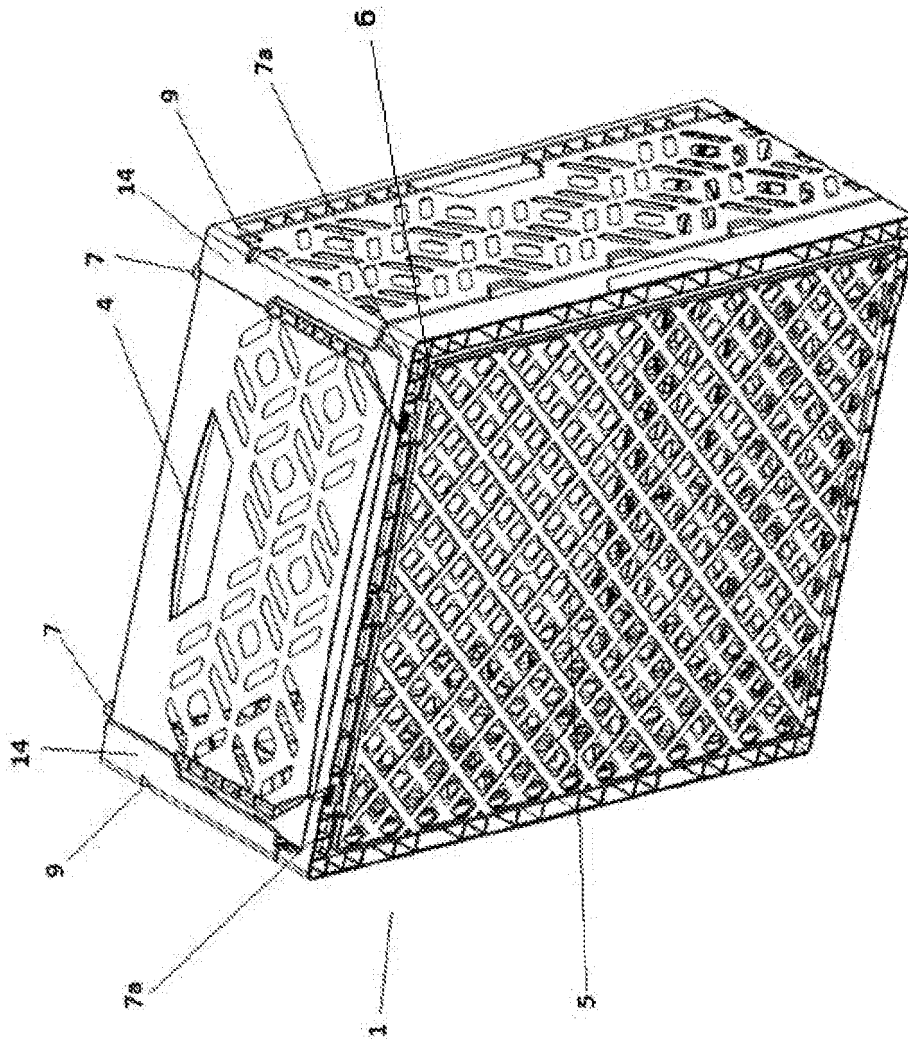


Figure 2

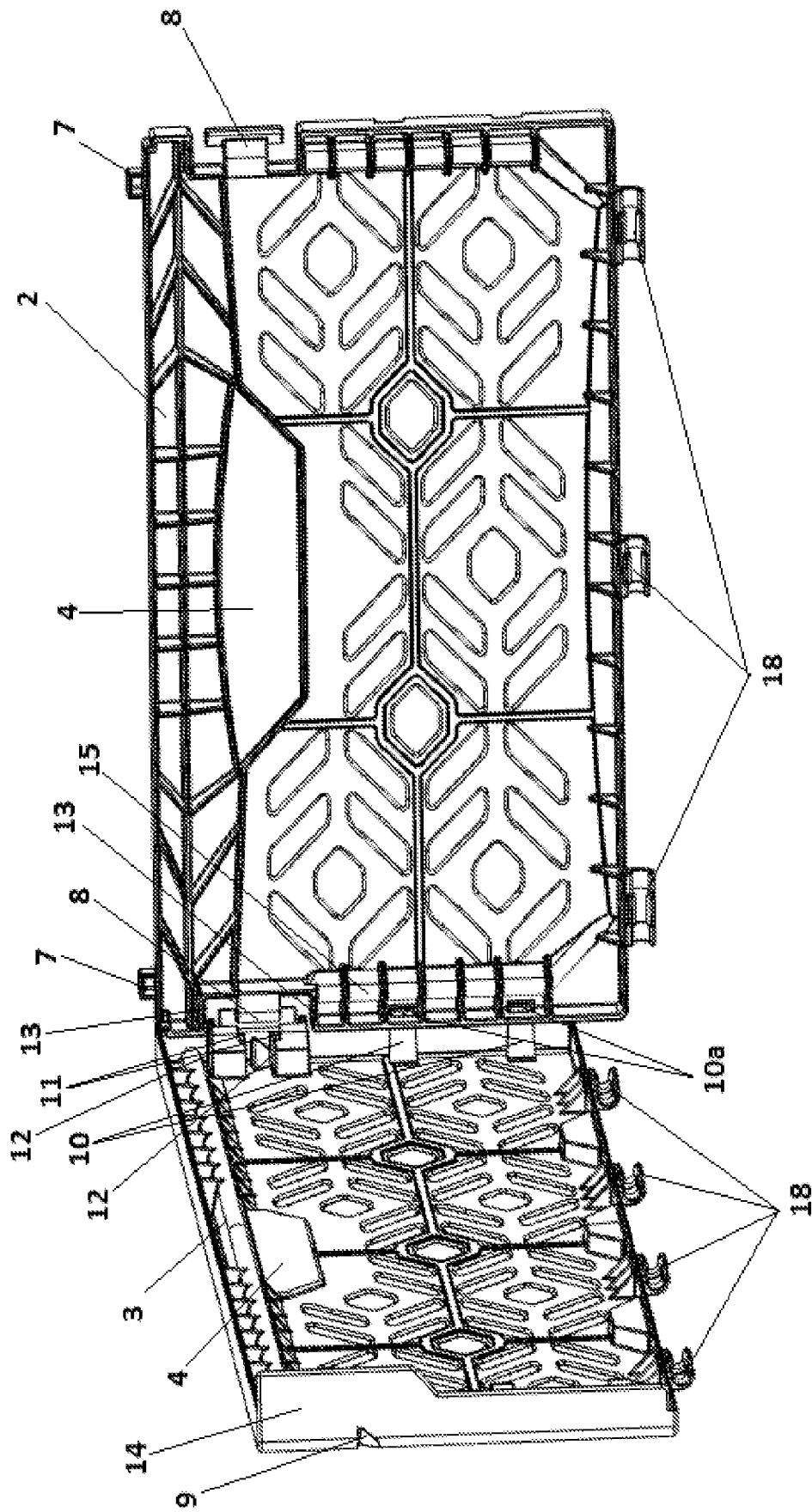


Figure 3

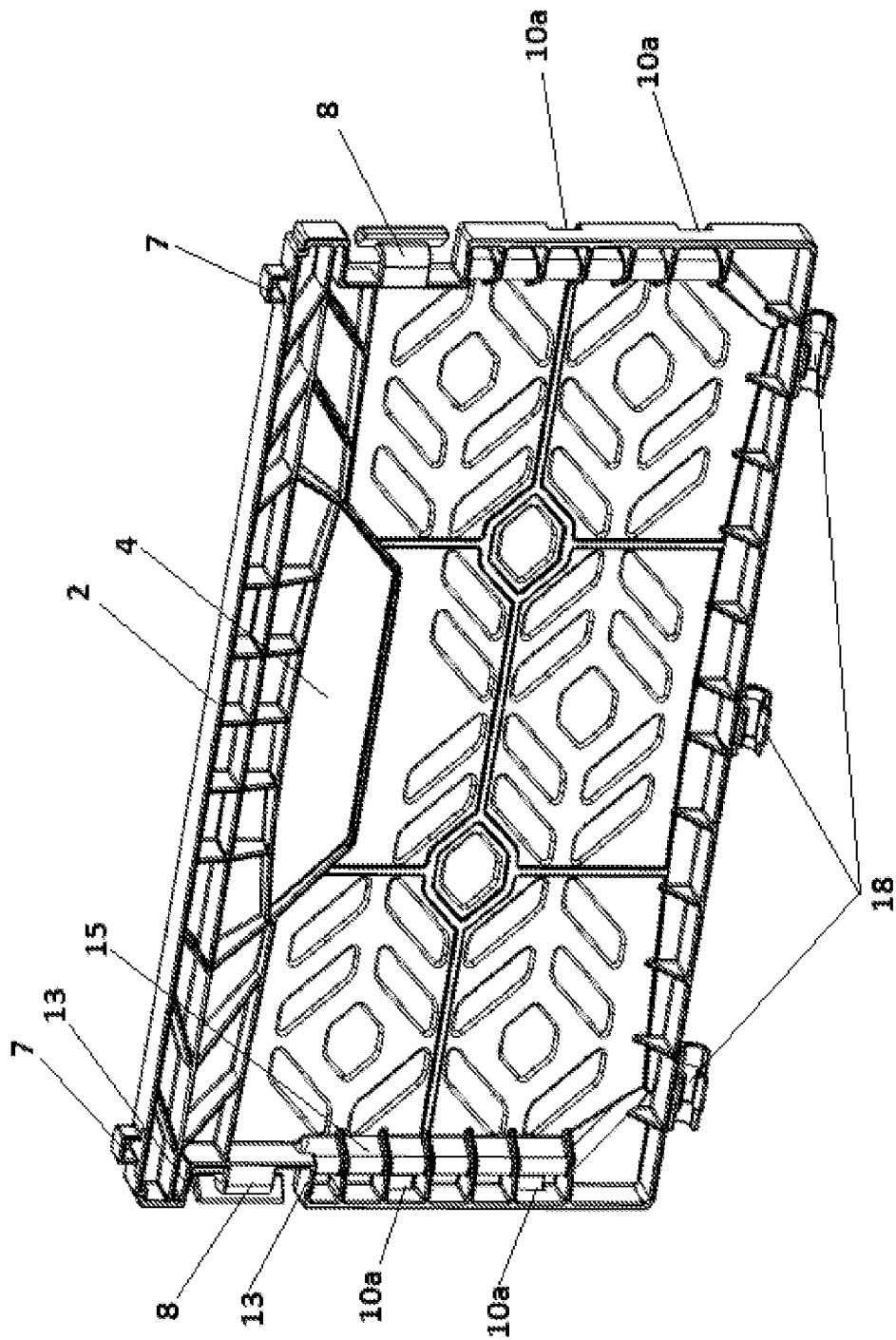


Figure 4

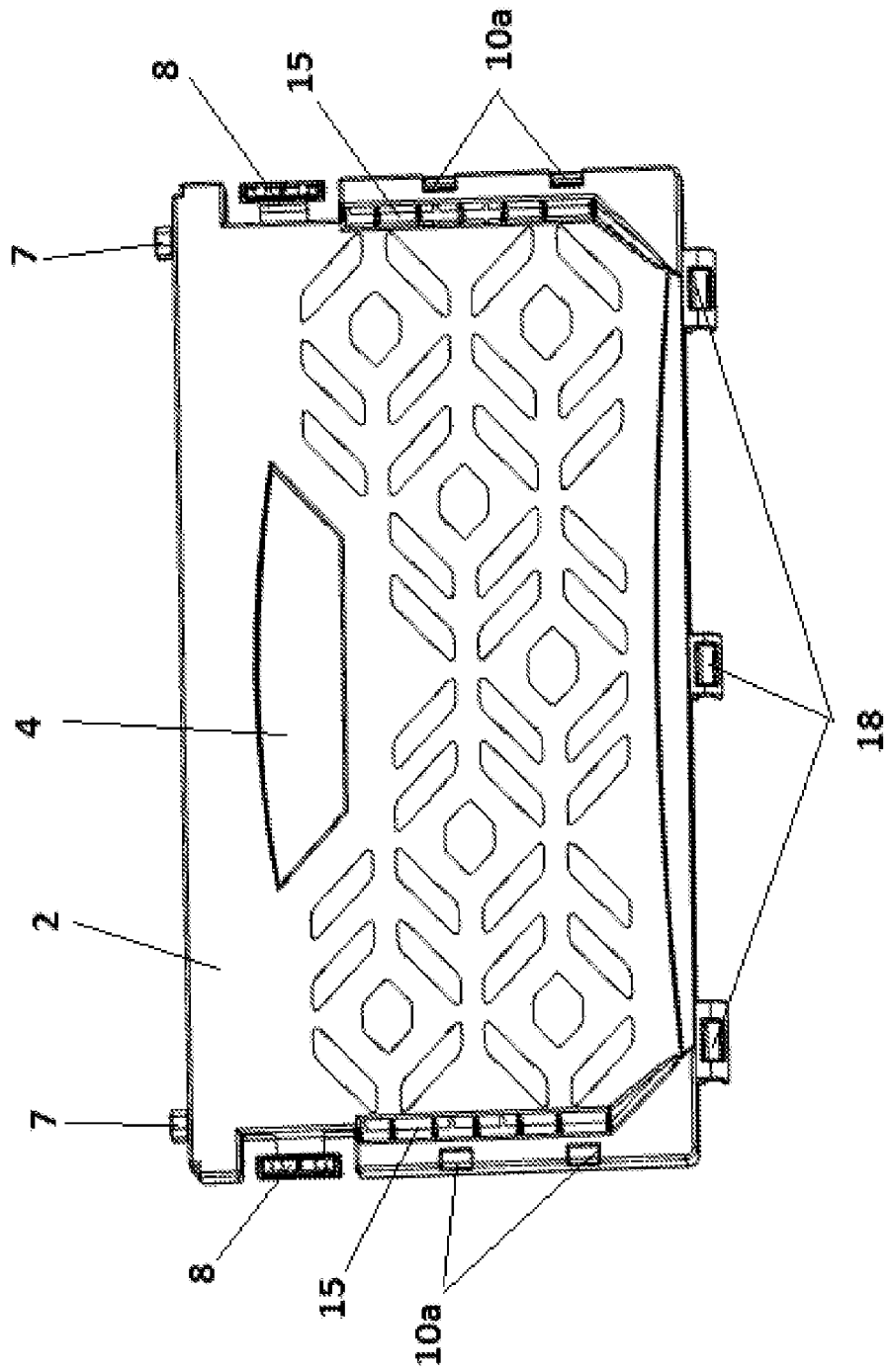


Figure 5

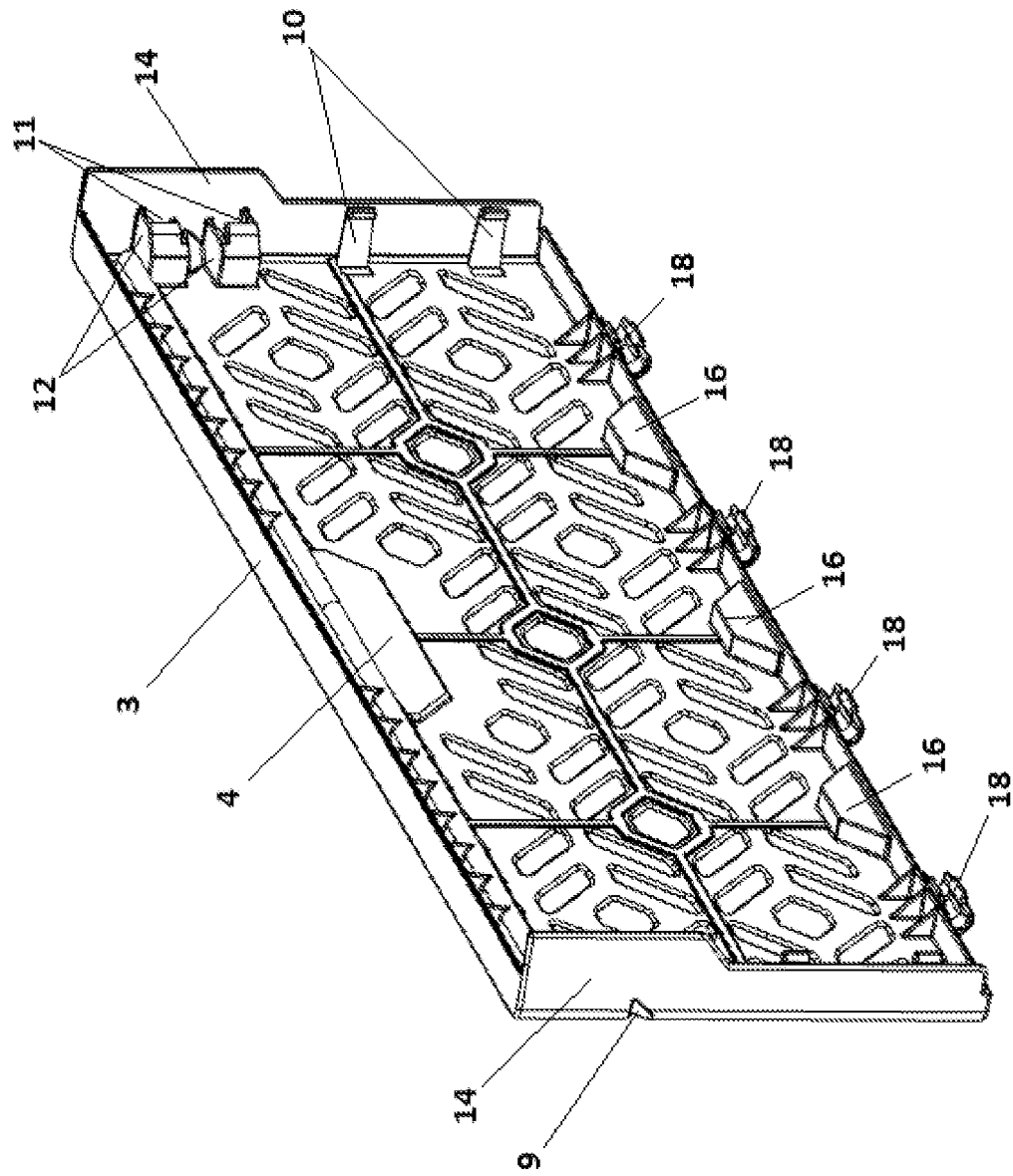


Figure 6

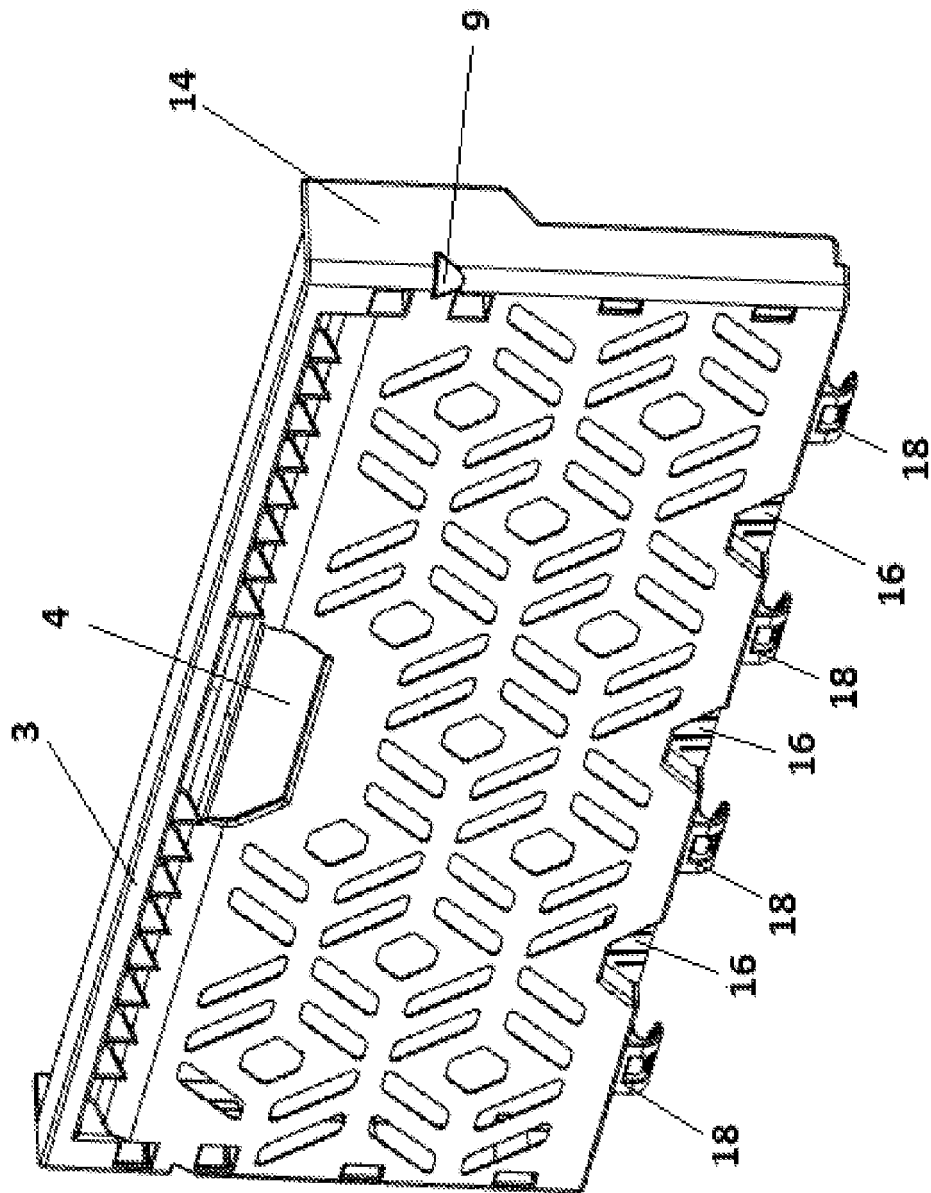


Figure 7

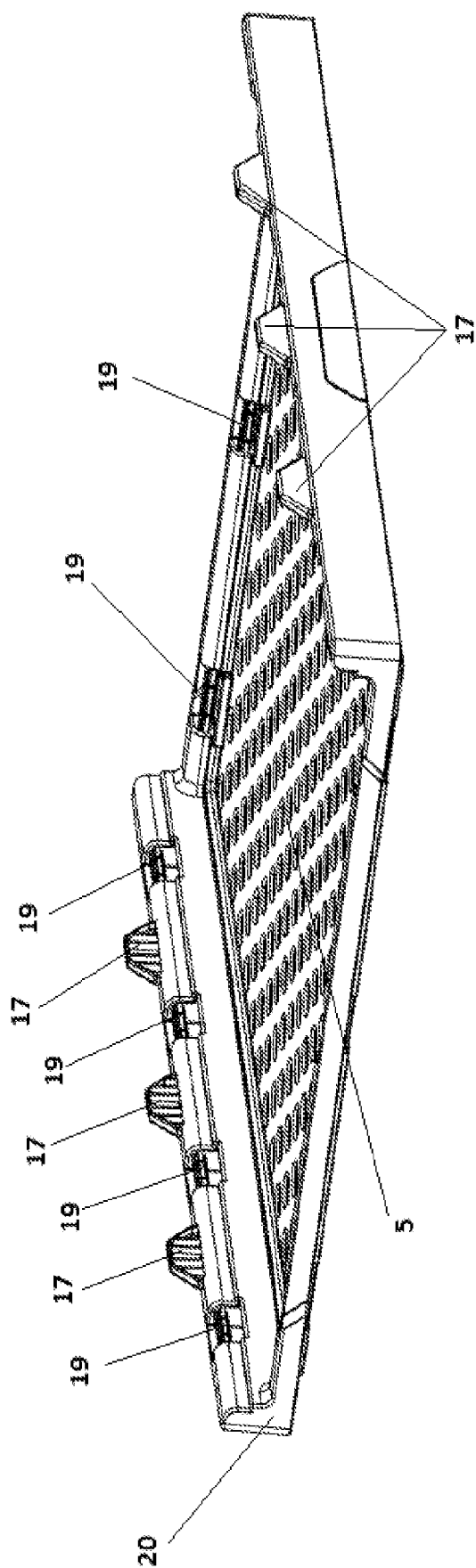


Figure 8

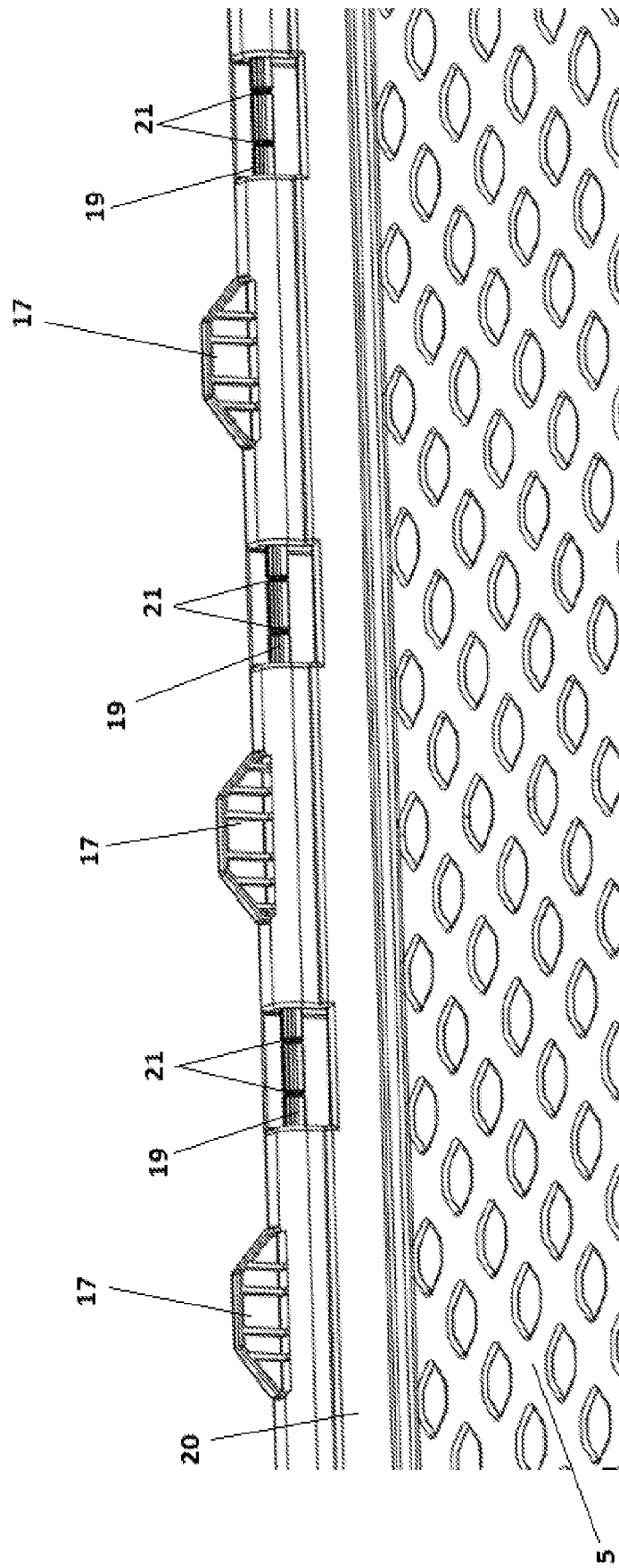


Figure 9

REFERENCES CITED IN THE DESCRIPTION

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