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(54) **A loading tool**

(57) The invention relates to a loading tool (1) for transferring a determined number of objects (2) into a packaging (3) comprising a predetermined number of compartments (41) arranged in a two-dimensional array of compartments (4, 4a, 4b) suitable for being loaded with one object (2) each, wherein the compartments (41) have a suitable shape to separate the loaded object (2)

from the objects (2) loaded to adjacent compartments (41) and the array of compartments (4, 4a, 4b) is at least partly surrounded by a guiding wall (5) and wherein the loading tool (1) comprises an opening (6) at one side or is adapted to be opened on one side suitable to securely transfer the objects (2) into the packaging (3). The invention further relates to a method to apply such a loading tool (1).

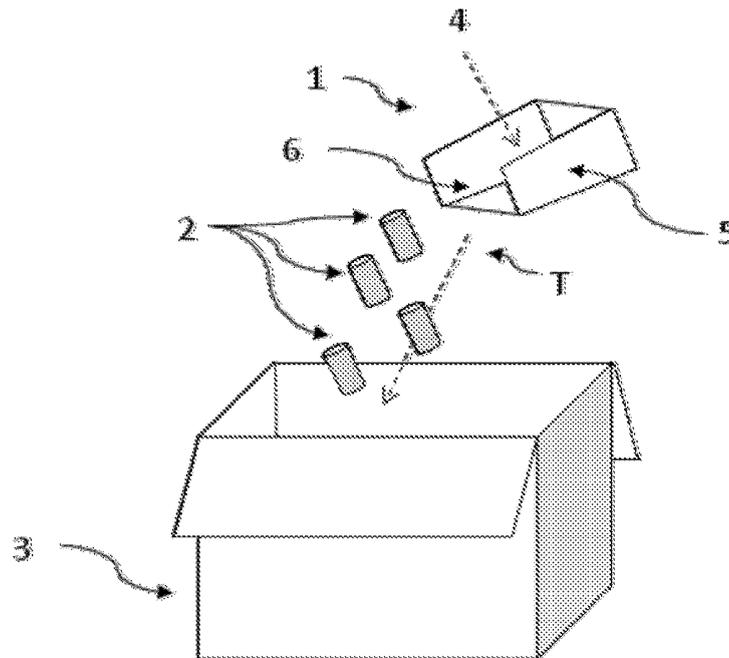


Fig.1

Description

Field of the invention

[0001] The invention relates to a loading tools to transfer a determined number of objects into a packaging and to a method to apply this loading tool.

Background of the invention

[0002] Small parts of any kind (e.g. small products or components of products) are often transported in boxes comprising a large number of these small parts. The boxes should contain a defined number of these parts providing a reliable defined number of parts per box delivered to the recipient of such boxes. The reliable number of parts enables a well defined further processing of these parts or enables the ordering of a minimum required number of boxes containing these small parts. Unfortunately the counting of parts is difficult and time consuming, especially for small parts. In case of parts with a more complex shape (e.g. headsets for cellular phones), these counting can only be executed by a manual process most likely leading to loaded transport boxes carrying a varying number of parts. The large number of loaded pieces and their properties (e.g. low weight) makes it very difficult to determine the number of loaded pieces indirectly, e.g. by weighting the boxes. It is desired to obtain a process to reliable count pieces, especially small pieces, and load a defined number of pieces to a packaging, e.g. a transport box.

[0003] Document DE 2540924 C3 discloses a device suitable to load groups of fruits of a defined number out of a reservoir of fruits into a net. The fruits are aligned in separated parallel rows, where the device transfers one fruit per row into a further device area for packaging via a shutter opening and closing the row. This device is suitable for larger pieces such as fruits having a diameter of at least a few centimeters and is adapted to fruits having a shape suitable to roll along the rows. However, for packaging a large number of objects into one transport box, e.g. components of a cellular phone varying in shape and size commonly not able to roll along a path, the devices as disclosed is not suitable.

Summary of the invention

[0004] It is an object of the present invention to provide a loading tool to securely load a determined number of objects into a packaging and a method to use this tool.

[0005] The object is solved by a loading tool for transferring a determined number of objects into a packaging comprising a predetermined number of compartments arranged in a two-dimensional array of compartments suitable for being loaded with one object each, wherein the compartments have a suitable shape to separate the loaded object from the objects loaded to adjacent compartments and the array of compartments is at least partly

surrounded by a guiding wall and wherein the loading tool comprises an opening at one side or is adapted to be opened on one side suitable to securely transfer the objects into the packaging.

[0006] Packaging denotes any kind of boxes suitable to carry objects from one place to another place. Packaging may be boxes, containers, parcels etc.

[0007] The objects may be separate products or components of products. The objects may have any shape and size. The objects may have complex shapes such as cables or headsets. However, the loading tool is especially suitable to count and transfer small objects into a packaging. The term "small objects" denotes objects with sizes, which are considered as being small in at least one direction, preferably with a size in one direction below 2 centimeters, more preferably below 1 centimeter, even more preferably below 0.5 centimeter. As an example, a ball with a diameter of 3 centimeters is not denoted as small in the present invention. In contrast to that, a flat rectangular object of width and length of 3 centimeter and a height of 0.4 centimeter is a small object in terms of this invention, because the height of this example is below 0.5 centimeter. Also a cable for a headset with a length of several centimeters, but with a common cable diameter of less than a few millimeters is a small object in terms of this invention, because the diameter of the cable is below 1 centimeter, probably below 0.5 centimeter. The loading tool is even more suitable to count and transfer objects into a packaging being small in all directions.

[0008] The counting of the objects is executed by placing one object in each compartment of the array of compartments. After filling the loading tool in this way, the loading tool is denoted as fully loaded. Since the array of compartments comprise a predetermined number of compartments, the number of compartments equals the number of objects loaded to the compartments. Therefore the loaded objects are counted exactly and therefore the number of objects is determined.

[0009] For providing a packaging with a reliable number of objects inside the packaging, the exactly counted number of objects has to be transferred into the packaging. To ensure, that all counted objects are transferred into the packaging, a guiding wall is arranged around the array of compartments to prevent objects from falling outside the loading tool in a non-desired direction, meaning preventing objects from falling not into the packaging. The guiding wall may have any shape and size suitable to fulfill the previous requirement. Preferably the guiding wall is arranged essentially vertical to the two-dimensional array of compartments without any gap between compartments and wall, which would be sufficient for objects to fall outside the loading tool. To be able to transfer the objects loaded to the loading tool to the packaging, the guiding wall needs to have an opening, which could be permanently open or able to be opened and closed on demand. As an example, the guiding wall may surround a rectangular array of compartments on three

sides. Here, the open fourth side is the opening suitable to transfer the objects to the packaging. To securely transfer the objects, the fourth side should have a width smaller than the open packaging at least in one direction. The objects are dumped (transferred) from the loading tool into the packaging via the fourth open side of the loading tool. Alternatively the fourth side may be arranged as a funnel enabling to load objects from larger loading tools into smaller packaging.

[0010] In an embodiment the shape and/or size of the compartments is adapted to the type of objects to be loaded into the compartments. Since the objects may differ in size and shape, a fast loading of the compartments (and therefore fast counting of the objects) can only be executed with such arrays of compartments adapted to particular objects. The compartments may be shaped as hemispheres, where objects smaller than the diameter of the hemisphere can be placed. In other embodiments the compartments may be rectangular areas, where rectangular shaped objects can be placed, or cylindrically shaped cavities, where elongated objects (e.g. cables) can be placed. The compartments of different arrays of compartments may have different sizes of compartments, larger compartments in case of larger objects to be loaded and smaller compartments in case of smaller objects to be loaded.

[0011] In another embodiment the properties of the array of compartments predetermines the number of compartments within one array of compartments or that the array of compartments comprises at least one tag indicating the predetermined number of compartments within this array of compartments. The properties of the array of compartments may be the total size of the array and/or the color of the array or parts of the array. If the number of compartments is obvious from the size of the array of compartments, it is easy for any operator to recognize the number of compartments and therefore the number of present objects in case of a fully loaded loading tool. The loading tool may have 25 compartments, 50 compartments or 100 compartments within an array of compartments. The sizes for such arrays of compartments differ enough to be easily visually recognizable. Alternatively in case of differently shaped compartments, an array of compartments of a particular size may have different numbers of compartments compared to another array of the same size with differently shaped compartments. Here the present number of compartments in an array of compartments can be indicated by a suitable tag. The tag should be placed on the array of compartments at a location easily visual, e.g. on the surface. In other embodiments the tag may be the color of the compartment or of a part of the compartments or the color of a side, preferably the back side, of the array of compartments. As an example the array of compartments with 25 compartments may be colored red on the backside, for 50 compartments it may be colored blue etc. Here, the particular mentioned colors are only examples. People skilled in the art may choose other color codes to indicate

the number of compartments present in the array of compartments within the scope of this invention. In other embodiments the tag may comprise machine readable information transferred to a display device displaying the number of compartments of the present array of compartments to be loaded with objects. The machine-readable information may be provided by the tag arranged as a RFID tag. The advantage of RFID-information about the number of compartments is the possibility to mount the tag at any location on the loading device or the array of compartments.

[0012] In another embodiment the loading tool further comprises a transfer tool with a base surrounded by the guiding wall, wherein the two-dimensional array of compartments is provided as a separate compartment unit to be inserted into the transfer tool on top of the base. In a preferred embodiment of the loading tool, the compartment unit can be reversible inserted into the transfer tool. Here, a transfer tool adapted to the shape and/or size of a certain packaging can be used for counting and transferring completely different objects. The suitable compartments can be adapted for any kind of object by choosing the suitable compartment unit comprising the array of compartments. If all different compartment units have the same size, the particular unit required for counting certain objects can be exchanged on demand and can be used within the same transfer tool. In this way, the processes for the adapting the loading tool either to different packaging or to different objects can be separated. The base of the transfer tool can have any shape, for example a rectangular, quadratic, hexagonal or any other suitable shape, where the shape of the compartment unit has to fit onto the base. Furthermore the base may have a contour, for example adapted to the shape of the compartments on the lower side of the compartment unit placed on top of the base. However, to obtain a transfer tool suitable for different kind of arrays of compartments, the base is preferably a flat bottom plate to be suited for any contour of the compartment unit on its lower side (backside). Here the lower side or backside denotes the side of the compartment unit (and also the array of compartments) opposite to the side, where the objects are placed on top.

[0013] In a preferred embodiment the compartment unit is a grid, preferably able to be lifted or to be removed, with an open top and an open base defining the compartments in combination with the base of the transfer tool, where the shape of the grid is adapted to prevent objects placed on top of the base from slipping from one compartment to any adjacent compartment. The term "grid" denotes an array of barriers enclosing a volume. This volume establishes a compartment when placed on top of the base, where the base is the bottom surface of the volume. The object is placed inside the volume on top of the base. The grid may comprise an array of crossing walls aligned in several rows and columns. The rows and columns may have any angle between crossing rows and columns, preferably the angle is 90° (rectangular grid) or

135° (hexagonal grid). The grid prevents any slippage of objects from one compartment to an adjacent compartment. If the loading tool is tilted towards the packaging, the grid will also prevent the objects from being transferred into the packaging. To transfer the objects into the packaging, the loading tool has to be turned around to dump the objects to the packaging via the open top of the grid. However, it is advantageous, if the grid can be lifted until the objects are able to slip over the base. Here a tilting of the loading tool leads to a defined process of dumping the objects into the packaging. The same is the case, if the grid is totally removed from the transfer tool to transfer the objects into the packaging.

[0014] In a preferred embodiment the transfer tool is adapted to be placed on top of the packaging and the base is removable in order to transfer the objects into the packaging. The transfer tool on top of the packaging prevents any object falling alongside the packaging during to transfer process. The transfer process (transferring the objects into the packaging) is even simplified, because only the base has to be removed for transferring the objects into the packaging. No additional handling of the loading tool is required avoiding the risk to lose objects during such a handling. Additionally the transfer process is independent from the shape of the compartments. In a preferred embodiment, the loading tool comprises a funnel arranged between the base of the transfer tool and the packaging, where the lower side of the funnel is adapted to fit onto the packaging and the upper side of the funnel is adapted to fit to the shape of the base. This has the advantage, that even large loading tools can be used to transfer objects in smaller packaging without losing any object by falling alongside the packaging.

[0015] In another embodiment the compartment unit is arranged as a plate carrying the compartments provided as cavities, where preferably the cavities within the plate are separated from each other by horizontal areas between the cavities. Here the objects are placed inside the cavities and are transferred to the packaging by sufficiently tilting the loading tool towards the packaging and subsequently by dumping the objects slipping along the upper surface of the compartment unit into the packaging. The loading tool according to this embodiment is simple to manufacture and to handle. However, the dimensions of the loading tool have to be adapted to the dimensions of the packaging in order to securely transfer the objects into the packaging. The surface of the compartment unit should be slippery enough to support the transfer of objects into the packaging. As an example, the surface may be polished to obtain a smooth surface.

[0016] In an embodiment the opening of the loading tool is a gap in the guiding wall of the transfer tool. The gap may have any suitable shape and size.

[0017] In another embodiment the surface of the compartments comprises a diffuse reflecting material. Avoiding disturbing reflections from the compartments makes it easier to recognize, if the particular compartment is already loaded with one object, especially in case of very

small objects. In a preferred embodiment the material is a white or a fluorescent or phosphorescent material. Such a white, fluorescent or phosphorescent surface of the compartment makes it even easier to recognize, if the particular compartment is already loaded with one object or not. Especially the use of fluorescent or phosphorescent materials, which are self illuminating after being activated (e.g. by a UV lamp), enables an easy recognition of loaded or empty compartments independently from the color of the objects.

[0018] In another embodiment the loading tool further comprises a counting means suitable to counter the number of executed transfers of objects with this loading tool. In case of packaging to be loaded with a large number of objects exceeding the number of compartments in an array of compartments, the loading tool has to be fully loaded and the objects have to be transferred in the packaging multiple times. In order to count the total number of transferred objects, the total number of transferred objects results from the number of objects of a fully loaded loading tool times the number of executed transfers (number of executed transfer processes), which can be recorded by the counting means. As an example the counting means can be a counting wheel or any other suitable counting means mounted to the loading tool.

[0019] In another embodiment the loading tool is a hand-held device for manually loading and transferring of objects. This enables a flexible and easy application of the loading tool not requiring any further equipment or support.

[0020] The invention further relates to a method to transfer a determined number of objects into a packaging with a loading tool as claimed in the present invention comprising the steps of

- loading one object into each of the compartments arranged in a two-dimensional array, and
- transferring the objects into the packaging through the opening of the loading tool.

[0021] In an embodiment of the method the loading tool further comprises a transfer tool with a base, a guiding wall surrounding the base and the two-dimensional array of compartments as a separate compartment unit, characterized in that the step of transferring the objects comprises the steps of

- inserting the compartment unit into the transfer tool on top of the base,
- placing the transfer tool on top of the packaging, and
- removing the base of the transfer tool in order to transfer the objects into the packaging.

[0022] In another embodiment the method further comprises the step of selecting a two-dimensional array of compartments adapted to the type of objects to be loaded into the compartments. This enables to count objects in a flexible sequence for different packaging.

[0023] The materials of the loading tool, the transfer tool, the base and the array of compartments or the compartment unit can be any suitable material. The material can be the same for all the components or may differ for different components. In order to obtain a lightweight loading tool, the material can be cardboard or plastic. Alternatively, the material may be metal. In other embodiments, the array of compartments or the compartment unit may be transparent (e.g. glass or PMMA). To obtain a diffuse reflecting surface of the compartment unit, the material may be translucent (milky) glass or may comprise a corresponding coating at the upper surface, e.g. an adapted paint. For a fluorescent or phosphorescent coating, suitable pigments for paints are known.

Brief description of the drawings

[0024] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

Fig. 1: transferring objects into a packaging applying a loading tool according to the present invention.

Fig. 2: top view of an embodiment of the loading tool as shown in Fig. 1.

Fig. 3: another embodiment of the loading tool with exchangeable compartment units.

Fig. 4: a loading tool adapted to be placed on top of the packaging in order to transfer the objects directly into the packaging.

Fig. 5: a loading tool with a funnel adapted to connect loading tool and packaging in order to transfer the objects into the packaging.

Detailed description of embodiments

[0025] Fig. 1 shows an embodiment of the loading tool 1 according to the present invention loaded with objects 2. The objects 2 are transferred into a packaging 3 placed below the loading tool 1. The objects 2 are transferred (dashed arrow T) into the packaging 3 by tilting the loading tool 1 towards the packaging 3. The objects slip along the surface of the array of compartments 4 (not shown in details) and are subsequently dumped into the packaging 3 through an opening 6 within the guiding wall 5 surrounding the loading tool 1. The guiding wall 5 shall prevent objects from falling alongside the packaging 3 during the transfer process T. Here, the dimensions of the loading tool 1 are adapted to the dimensions of the open top of the packaging 3 to be able to dump all objects 2 securely into the packaging 3. The packaging in this example is a box, e.g. a cardboard box. The loading tool may be also made of cardboard or plastic. Alternatively the loading tool 1 could also be made of metal or any other suitable material.

[0026] Fig. 2 shows the loading tool 1 as shown in fig. 1 in a top view with a rectangular shape. As an example, there are eight compartments 41 arranged as a 2 x 4

array of compartments 4, where each compartment 41 carries one object 2 (here displayed schematically as gray triangles). The guiding wall 5 is indicated as gray area surrounding the array of compartments 4 on three sides (left side, right side and back side). The fourth side, here the front side, is not surrounded by the guiding wall 5. The front side is the opening 6 (= missing guiding wall), through which the objects 2 are dumped into the packaging as indicated by the dashed arrow T (= transfer of objects). The loading tool of figures 1 and 2 is a handheld device for manual transferring the objects 2 into the packaging. For this purpose, a holder 11 is mounted to the backside of the guiding wall 5. The surface of the array of compartment 4 further comprises a tag 7 indicating the number of compartments 41 present in the array of compartments 4. In this example, eight compartments 41 do not necessarily need such a tag 7. However, for larger loading tools and/or smaller compartments for smaller objects 2, there may be 25, 50 or 100 compartments within one array. For such a large number of compartments 41, a tag 7 is required to recognize the number of compartments 41 and subsequently the number of objects 2 loaded to a fully loaded loading tool 1 reliable at a glance. Additionally, a counting means 8 is mounted to the loading tool 1 in order to record the number of transfers of objects 2 is executed with this particular loading tool 1.

[0027] Fig. 3 shows another embodiment of the loading tool 1, where the array of compartments 4 is arranged as a compartment unit 4a and 4b, which are separate components of the loading tool 1. The compartment units 4a, 4b can be placed into a transfer tool 12 on top of a base 121 as part of the transfer tool 12. Compartment unit and transfer tool together establish the loading tool 1. To avoid any risk to lose objects 2 placed in the compartments 41, the transfer tool 12 comprises a guiding wall 5 surrounding the transfer tool 12, in this example on three sides. The fourth side comprises the opening 6 used to dump (transfer) the objects 2 into the packaging.

[0028] The compartment unit 4a is a plate with 3 x 4 compartments 41 arranged as hemispheric cavities. The plate 4a may be made of a diffuse reflecting material and/or may be white or coated with a fluorescent or phosphorescent material in order to simplify the recognition, whether an object 2 is already placed into a compartment 41 or not in order to fully load the compartment unit 4a with only one object 2 in each compartment 41. Only if one object 2 is loaded to each compartment 41, the number of compartments 41 equals the number of objects 2 loaded to the loading tool 1 and subsequently all loaded objects 2 are counted from the predetermined known number of compartments 41 present in the particular compartment unit 4a. The number of present compartments 41 can be provided by a corresponding tag 7 placed somewhere on the plate 4a, preferably placed visually. In other embodiments, the tag might be an RFID tag, which can be read-out with a suitable RFID reader and displaying the number of compartments on a suitable

display device arranged in the field of view of the operator placing objects into the compartments. In this case the tag can be placed also in location not directly visual for operators. The objects 2 may be placed into the cavities 41 after placing the compartment unit 4a into the transfer tool 12. Alternatively, the objects 2 may be placed into the compartment unit 4a outside the transfer tool 12 and then the fully loaded compartment unit 4a is placed into the transfer tool 12. In case of a grid 4b with open top and open base as the compartment unit, the grid 4b has to be inserted into the transfer tool 12 before placing objects into the compartments 41, because the grid establishes the compartment 41 in combination with the base 121 of the transfer tool 12. The transfer process T might be executed by dumping the objects 2 out of the grid 4b into the packaging 3. Preferably, the grid is able to be lifted or removed to easily dump the objects 2 with a tilted loading tool 1 into the packaging 3. The surface of the base 121 should support the gliding of the objects 2 over the surface towards the packaging 3. The surface might be a polished surface or made of a material providing a smooth surface, e.g. metal, plastic, glass, PMMA etc. The base 121 may be made of a diffuse reflecting material and/or may be white or coated with a fluorescent or phosphorescent material in order to simplify the recognition, whether an object 2 is already placed into a compartment 41 or not in order to fully load the compartment unit 4b with only one object 2 in each compartment 41. The transfer tool 12 may comprise guiding rails in the guiding wall 5 to lift and lower the grid 4b. The compartment unit (here indicated for plate 4a) may comprise a tag indicating the number of compartments 41 present in the compartment unit 4a, 4b.

[0029] Fig.4 shows another embodiment of the loading tool 1, where the loading tool 1 is placed on top of the packaging 3. Therefore the shape of the loading tool 1 has to be adapted to fit on top of the packaging 3. The fitting might be achieved by a suitable snug fit or by connection means attached to the loading tool, such as suitable ledges extending over the edges of the packaging or clips to fix the loading tool to the packaging 3. People skilled in the art may choose other connection means within the scope of this invention. The suitable compartment unit for the loading tool shown in fig.5 is a grid 4b with an open base. The transfer of the objects 2 into the packaging 3 is executed by removing the base 121 from the loading tool 1 indicated as dashed arrow R. The base might be arranged in guiding rails of the transfer tool 12. The objects 2 fall through the open base of the grid 4b directly into the packaging 3. The opening 6 in this case is the complete base of the grid 4b.

[0030] Fig.5 shows an alternative embodiment to the embodiment shown in fig.4. Here a loading tool 1 larger than the open top of the packaging 3 is applied for counting and transferring the objects 2 into the packaging 3. In order to reliably transfer all objects 2 to the packaging 3, a funnel 9 is placed between the packaging 3 and the loading tool 1. Here the shape of the funnel 9 has to be

adapted to the shape of the base 121 of the loading tool 1 at the upper side and to the shape of the open top of the packaging 3 at the lower side. The funnel 9 should be made of any material enabling a gliding of objects 2 into the packaging 3.

[0031] While the invention has been illustrated and described in details in the drawings and foregoing description, such illustration and description are to be considered illustrative or exemplary and not restrictive; the invention is not limited to the disclosed embodiments.

[0032] Other variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. Any reference sign in the claims should not be construed as limiting the scope.

List of reference

[0033]

- 1 loading tool
- 11 holder
- 12 transfer tool
- 121 base
- 2 objects
- 3 packaging
- 4 array of compartments
- 4a compartment unit
- 4b grid
- 41 compartment
- 42 horizontal area of compartment unit
- 5 guiding wall
- 6 opening
- 7 tag indicating number of compartments
- 8 counting means
- 9 funnel
- T transferring objects from the loading tool into the packaging
- R removing the base

Claims

1. A loading tool (1) for transferring a determined number of objects (2) into a packaging (3) comprising a predetermined number of compartments (41) arranged in a two-dimensional array of compartments (4, 4a, 4b) suitable for being loaded with one object (2) each, wherein the compartments (41) have a suitable shape to separate the loaded object (2) from the objects (2) loaded to adjacent compartments (41)

- and the array of compartments (4, 4a, 4b) is at least partly surrounded by a guiding wall (5) and wherein the loading tool (1) comprises an opening (6) at one side or is adapted to be opened on one side suitable to securely transfer the objects (2) into the packaging (3).
2. The loading tool (1) according to claim 1, **characterized in that** the shape and/or size of the compartments (41) is adapted to the type of objects (2) to be loaded into the compartments (41).
 3. The loading tool (1) according to claim 1 or 2, **characterized in that** the properties of the array of compartments (4, 4a, 4b) predetermines the number of compartments (41) within one array of compartments (4, 4a, 4b) or that the array of compartments (4, 4a, 4b) comprises at least one tag (7) indicating the predetermined number of compartments (41) within this array of compartments (4, 4a, 4b).
 4. The loading tool (1) according to any of the preceding claims, **characterized in that** the loading tool (1) further comprises a transfer tool (12) with a base (121), preferably a bottom plate, surrounded by the guiding wall (5), wherein the two-dimensional array of compartments (4) is provided as a separate compartment unit (4a, 4b) to be inserted, preferably reversible inserted, into the transfer tool (12) on top of the base (121).
 5. The loading tool (1) according to claim 4, **characterized in that** the compartment unit (4b) is a grid, preferably able to be lifted or to be removed, with an open top and an open base defining the compartments (41) in combination with the base (121) of the transfer tool (12), where the shape of the grid (4b) is adapted to prevent objects (2) placed on top of the base (121) from slipping from one compartment (41) to any adjacent compartment (41).
 6. The loading tool (1) according to claims 4 or 5, **characterized in that** the transfer tool (12) is adapted to be placed on top of the packaging (3) and the base (121) is removable in order to transfer the objects (2) into the packaging (3).
 7. The loading tool (1) according to claim 4, **characterized in that** the compartment unit (4a) is arranged as a plate carrying the compartments (41) provided as cavities.
 8. The loading tool (1) according to claim 7, **characterized in that** the cavities (41) within the plate (4a) are separated from each other by horizontal areas (42) between the cavities (41).
 9. The loading tool (1) according to any of claims 4, 7
- or 8, **characterized in that** the opening (6) of the loading tool (1) is a gap in the guiding wall (5) of the transfer tool (12).
10. The loading tool (1) according to any preceding claim, **characterized in that** at least the surface of the compartments (41) comprises a diffuse reflecting material, preferably a white or fluorescent or phosphorescent material.
 11. The loading tool (1) according to any preceding claim, **characterized in that** loading tool (1) further comprises a counting means (8) suitable to counter the number of executed transfers of objects (2) with this loading tool (1).
 12. The loading tool (1) according to any preceding claim, **characterized in that** the loading tool (1) is a hand-held device for manually loading and transferring of objects (2).
 13. A method to transfer a determined number of objects (2) into a packaging (3) with a loading tool (1) as claimed in claim 1 comprising the steps of
 - loading one object (2) into each of the compartments (41) arranged in a two-dimensional array (4, 4a, 4b), and
 - transferring the objects (2) into the packaging (3) through the opening (6) of the loading tool (1).
 14. The method as claimed in claim 13, wherein the loading tool (1) further comprises a transfer tool (12) with a base (121), a guiding wall (5) surrounding the base (121) and the two-dimensional array of compartments (4) as a separate compartment unit (4a, 4b), **characterized in that** the step of transferring the objects (2) comprises the steps of
 - inserting the compartment unit (4a, 4b) into the transfer tool (12) on top of the base (121),
 - placing the transfer tool (12) on top of the packaging (3), and
 - removing the base (121) of the transfer tool (12) in order to transfer the objects (2) into the packaging (3).
 15. The method as claimed in claim 13 or 14, **characterized in that** the method further comprises the step of selecting a two-dimensional array of compartments (4) adapted to the type of objects (2) to be loaded into the compartments (41).

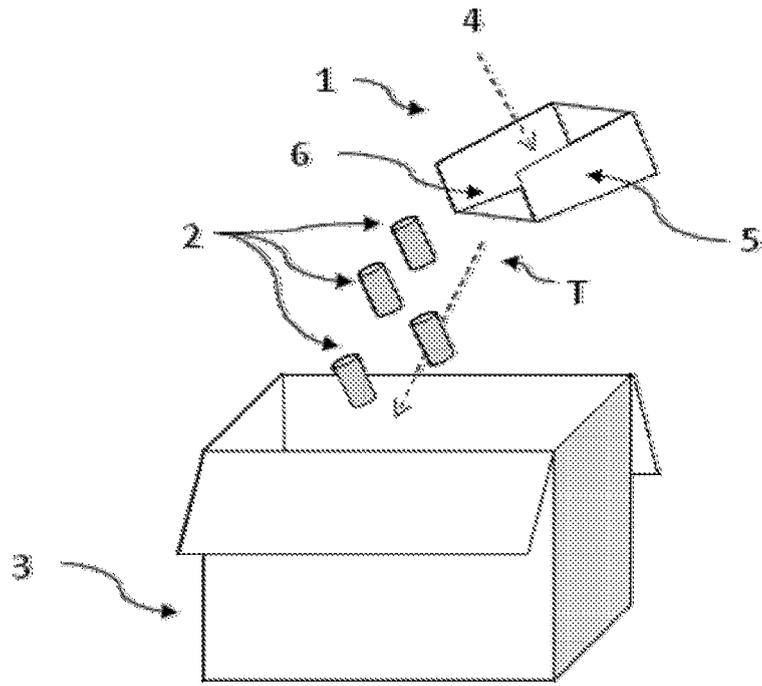


Fig.1

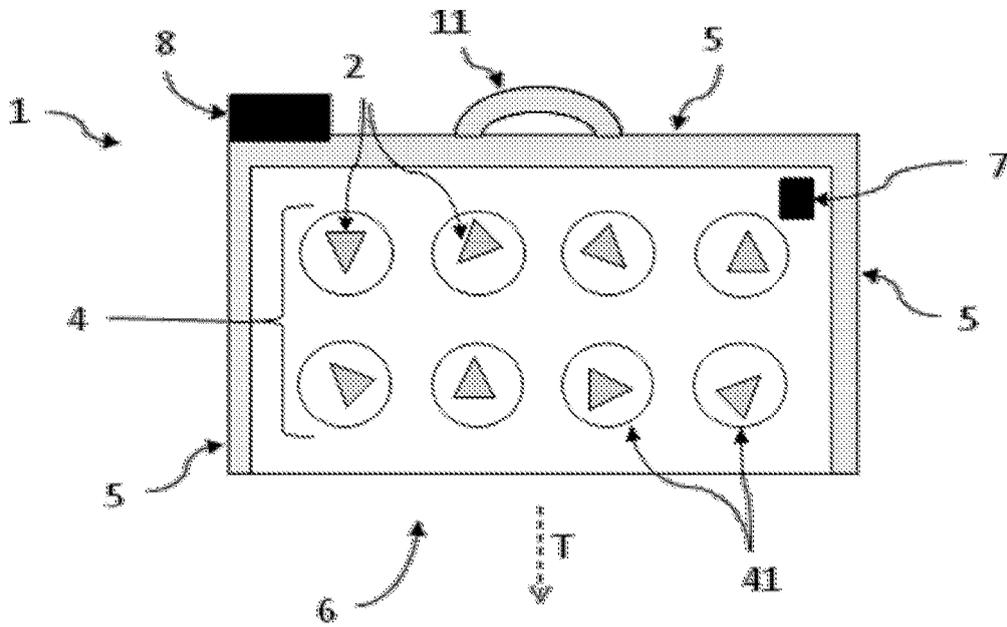


Fig.2

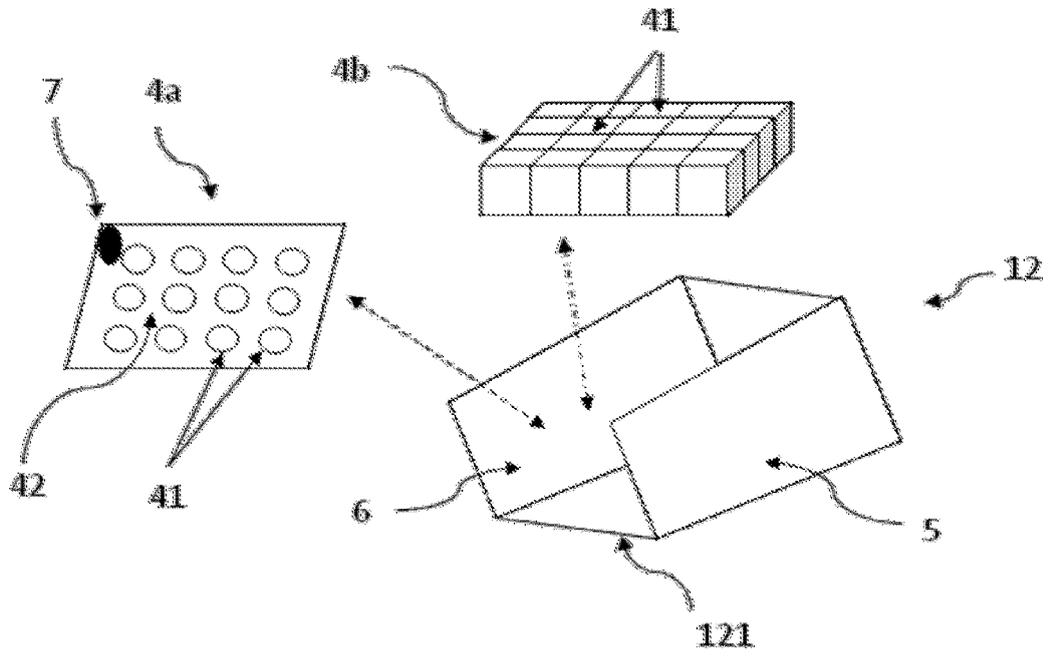


Fig. 3

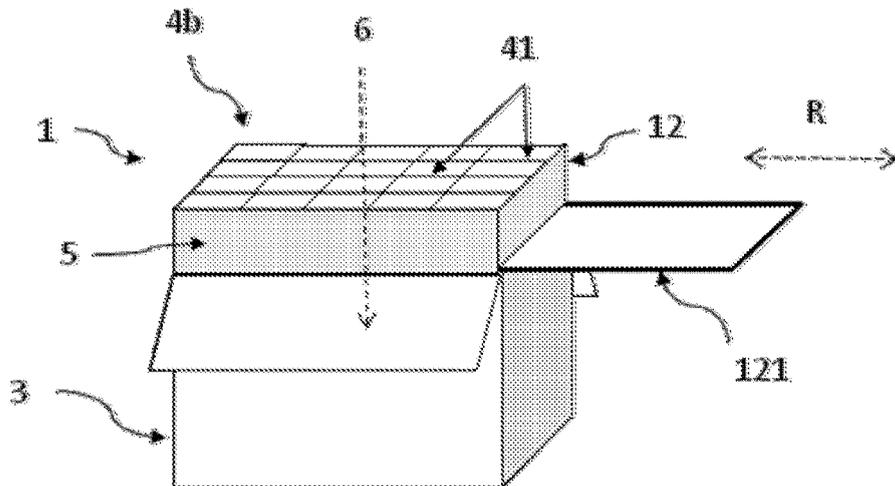


Fig. 4

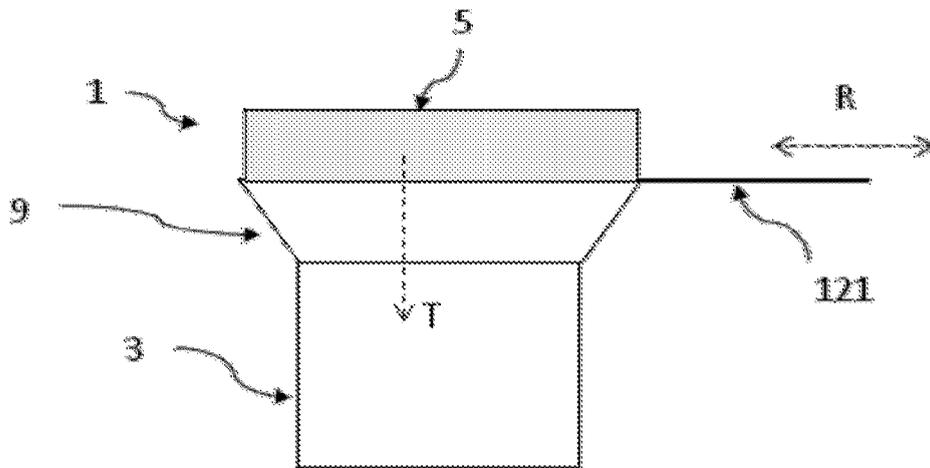


Fig.5



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 2660

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/084808 A1 (STANLEY KEVIN F [US]) 2 April 2009 (2009-04-02) * paragraphs [0019] - [0022]; figures 1-5 *	1-3,10, 12,13	INV. B65B5/06 B65B39/00 B65B67/02
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