

DESCRIPTION

REUSABLE TRAY CONTAINER

Technical field

The present invention relates to a container generally shaped as a tray and reusable several times, for example in logistics or object movement contexts, that may be the security check areas in airports or the chains of
5 transport of products or semi-finished products along industrial production lines.

Background art

As is known, in several professional or social contexts, there is the need to move one or more objects along a "forced" logistics and/or inspection line:
10 let us consider, for example, the X-ray scanning machines at airports, which have suitable advancement rollers on which passengers' objects are made to transit.

Generally, in these contexts, the objects to be moved are collected in special containers that define a collection space always open on one side
15 (in order to ensure a rapid loading and unloading of the container itself): these containers are generally box-shaped or, still more commonly, they are trays or similar objects.

In this operating environment, despite the intrinsic simplicity of the containers-trays, there are still structural and functional aspects that can
20 be improved: let us consider, for example, the cost-effectiveness of production combined with a great durability, a high recyclability of trays at their "end of life" and of the possibility of using these same objects also for other secondary purposes such as advertising or the attribution of univocal identification parameters of the objects loaded therein.

Detailed description of the drawings

25 In comparison with the known art and the problems mentioned above, the object of the present invention is therefore to provide a usable tray container which has a greater and better functional utility both in terms of ease and cost-effectiveness of production and in terms of durability and

also in terms of the possibility of adding one or more accessory functions to the mere containment of objects "in transit" along a given handling line.

Described herein, by way of non-limiting example, is an embodiment of a reusable container - shaped for example as a tray - according to the invention, shown in the accompanying exemplary, however not limiting, figures, wherein:

- Figures 1 to 6 show schematic views of different types of containers according to the present invention.

The reusable tray container according to the invention is globally indicated with the reference numeral 1 in the accompanying figures and, from the structural point of view, comprises a body 2 defining a three-dimensional structure: in turn, this three-dimensional structure defines a collection space 3 for a predetermined number of objects that can be positioned in the container 1 (this is therefore a semi-open space from the topological point of view).

Conveniently, the invention further comprises a removable layer 4 associated with the body 2 and cooperating with the latter in order to define the just mentioned collection space 3: the removability of the layer 4 with respect to the body 2 makes it therefore interchangeable and arbitrarily replaceable according to the needs of the moment (which in turn may be of a more disparate nature: for example, a more or less "smooth" removable layer can be provided to exert a stronger or less strong friction retaining on the objects placed in the collection space 3 or the surface visual/aesthetic appearance of the removable layer 4 can be changed according to advertising or information display requirements, or even a plurality of mutually superimposed removable layers 4 can be arranged to increase the load-bearing capacity or to prepare at least one of these layers to be thrown away after a particularly heavy or "polluting" use of the container 1).

From a structural point of view, the removable layer 4 comprises at least one configurable planar element, preferably reversibly or repeatably,

between a flattening condition in which it has a substantially two-dimensional development and in which it is even more preferably separated from the body 2, and an operating condition in which it defines a three-dimensional volume open on at least one loading face and in which it is connected to the body 2 (this reversibility makes it possible to adopt different conformations and constitutions in terms of material for the removable layer 4, and also makes it possible to adopt different formulation methodologies to achieve the operational condition).

In a possible embodiment of the invention, the removable layer 4 comprises a predetermined number of programmed folding and/or deformation lines 5 adapted to change the geometrical configuration of the removable layer itself from the flattening condition to the operating condition: such programmed folding and/or deformation lines 5 are in turn adapted to define, in the operating condition of the removable layer 4, a bottom wall 4a, a predetermined number of side walls 4b perimetrically connected to the bottom wall and possibly also a predetermined number of perimeter corners 4c interposed between two adjacent side walls 4b of the container 1.

According to the three-dimensional conformation to be imparted to the container 1, the just mentioned perimeter corners 4c may be shaped according to three-dimensional prismatic portions, but it may also be the case that the perimeter corners 4c are shaped according to portions having one or more three-dimensional curvatures in space.

Returning to the concept of re-configurable planar element constituting the removable layer 4, it should be noted that the achievement and maintenance of its operating condition can conveniently be obtained by means of mechanical stabilization means 7 operating between different portions of the removable layer 4 (but also, if necessary, between the removable layer 4 and the body 2) to define precisely the operating condition itself.

The aforementioned mechanical stabilization means 7 may consist of

hooking systems of the known type, such as clips or rivets or snap buttons, preferably made of radio-transparent material, in order to allow correct use in the X-ray inspection machines: these hooking systems are placed between different parts or layers of the removable layer, keeping
5 the latter in the appropriate relative positions which globally define the aforementioned operating condition.

Alternatively, the stabilization means can also be implemented by means of localized shapings and/or folds and/or ultrasonic weldings interposed between adjacent parts or layers of the planar element constituting the
10 removable layer 4.

In order to improve the geometric/structural coherence features, or in order to implement accessory functions (such as the partitioning of the collection space 3 or the establishment of barriers that oppose random and/or uncontrolled movements of the objects loaded into the container 1), the
15 removable layer 4 may comprise suitable stiffening means 6 integrally obtained in the bottom wall 4a and/or in the side walls 4b and/or in the perimeter corners 4c: such stiffening means 6 may typically consist of folds and/or ribs formed integrally and seamlessly in delimited portions of the removable layer 4 itself.

20 Focusing now on the body 2, it can be observed that this includes:

- a predetermined number of elongated (for example, beam-shaped) elements 2a which define one or more corners of the bottom wall 4a and/or corners, preferably upper ones, of the side walls (4b);
- a predetermined number of angular elements 2b typically interposed
25 between two (or more) elongated elements 2a which in turn are placed along adjacent perimeter sides of the container 1; and
- means for engaging the removable layer 4 in the elongated elements 2a and/or in the angular elements 2b (the latter means are for example constituted by insertion undercuts and/or recesses such as those shown in
30 the figures).

For the purposes of the present invention, it should also be specified that

the methods of interconnection between the beam-shaped elongated elements 2a and the angular elements 2b can be made with any type of mechanical contact of known type (for example, interlocking or snap or bayonet extensions and so on) and can also be of the reversible type, in
5 such a way as to be able to guarantee an almost complete modularity of the body 2.

According to a further optional technical aspect of the invention, the removable layer 4 and/or the body 2 (and in particular, in a possible embodiment of the invention illustrated herein, the angular elements 2b)
10 comprise gripping and handling means 5 (also shaped according to different geometries well known in the pertinent technical field) suitable for allowing a grip by a user of the container 1.

In terms of further additional features attributable to the invention, it is also possible to mention the presence of suitable means for univocal
15 identification of the container 1 and/or of the objects placed in the container 1 (these means are typically constituted by RFID and/or NFC devices or in any case by assimilable technologies available in the state of the art) as well as of the presence of static or dynamic means of displaying messages and/or information reported on the surface of the removable
20 layer 4 and/or on the body 2.

The constituent materials of the invention can be selected, as anticipated above, so as to respond to various technical requirements: for example, the body 2 can be made of polymer matrix composite materials, while the removable layer 4 can be made with a transparent PET film (but if desired,
25 it is possible to imagine other materials, such as a polyurethane resin, which defines a certain value of sliding friction coefficient at the bottom of the collection space 3).

It can also be observed that the overall design of the shape and structure of the invention can take into account the possibility of stacking (vertically)
30 a plurality of containers 1: the shapes defined cooperatively by the body and the removable layer will therefore be such as to allow an

interpenetration between two overlapping containers.

The invention allows to obtain several advantages over the known art.

First of all, thanks to the peculiar constructive architecture of the container, and thanks to the particular possibility of choosing constitutive materials

5 and geometric shapes that can be implemented, it is possible to obtain a high degree of operational flexibility in terms of capacity and type of objects to collect and transport, along with a high strength and ability to resist abrasions and manipulations, also those which are not particularly delicate or in any case fast and intrusive.

10 Moreover, the presence of the removable layer makes it possible to replace in a very short time and with a very low environmental impact the part of the container that is more subject to wear (or that can be changed for aesthetic reasons or for changing advertising messages), to the whole advantage of the aforementioned operational flexibility but also of the
15 possibility of enriching the number of functions attributable to the same invention.

In greater detail, concerning advantages, it is possible to observe a greater dimensional flexibility, generated by the fact that the components by which the container 1 is constituted guarantee a flexibility of the product
20 in dimensional terms, impossible with any other plastic moulding technique (considering, for example, that the body can be obtained by processing a "package" of material that does not require complex and expensive moulding equipment, and therefore is easily modifiable).

Likewise, the accessory components mounted on the body and designed
25 for the auxiliary gripping/handling or stacking/storage functions are by their nature easily interchangeable with other components of different shapes.

The invention can also be easily decorated according to various known technologies, such as, for example, the application of a sublimation paper applied to the removable layer which, as already discussed several times
30 in the present description, actually "covers" the body.

A remarkable lightness can also be counted among the advantages of the

invention: the object of the present utility model weighs, on average, about half of any other product with the same intended use and with a comparable load volume having, in any case, a higher resistance to impact, abrasion and weightlifting.

- 5 It should also be noted that the structure of the present invention can be implemented with cheap materials and with quick and simple assembly operations, to the whole advantage of production and management savings.

- 10 It is finally evident that modifications or additions, which are obvious to a person skilled in the art, may be applied to the object of the present invention, without departing from the scope of protection provided by the appended claims.

CLAIMS

1. Reusable container for the collection and/or movement of objects, comprising a body (2) and at least one removable layer (4) said body (2) and said removable layer (4) mutually cooperating in order to define a three-dimensional structure, said three-dimensional structure comprising a collection space (3) for a predetermined number of objects which can be placed in the container (1), the removable layer 4 comprising in an operating condition, a bottom wall (4a), and a predetermined number of side walls (4b) perimetrically connected to the bottom wall, characterized in that the body (2) further comprises:
 - a predetermined number of elongated elements (2a) defining edges of the bottom wall (4a) and/or upper edges of the side walls (4b);
 - a predetermined number of angular elements (2b) interposed between two of said elongated elements (2a) placed along adjacent perimeter sides of the container (1), said angular elements (2b) further comprising gripping and handling means (5) suitable for allowing a grip by a user of the container (1); and
 - means for engaging the removable layer (4) in the elongated elements (2a) and/or in the angular elements (2b), said means for engaging comprising insertion undercuts and/or recesses.
2. Container according to claim 1, wherein said at least one removable layer (4) comprises at least one planar element which can be configured, reversibly or repeatably, between a flattening condition in which it has a substantially two-dimensional development and in which it is separated from the body (2), and the operating condition in which it defines a three-dimensional volume open on at least one loading face and in which it is connected to the body (2).
3. Container according to claim 2, wherein the removable layer (4) comprises a predetermined number of programmed folding and/or deformation lines (5) adapted to change the geometrical configuration of

the removable layer (4) itself from the flattening condition to the operating condition

4. Container according to claim 3, wherein said

5 programmed folding and/or deformation lines (5) are adapted to define, in the operating condition of the removable layer (4):

- the bottom wall (4a) of the container (1);

- the

predetermined number of side walls (4b) of the container (1) perimetrically connected to said bottom wall (4a); and

10 - a predetermined number of perimeter corners (4c) interposed between two adjacent side walls (4b) of the container (1).

5. Container according to claim 4, wherein said perimeter corners (4c) are shaped according to three-dimensional prismatic portions.

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6. Container according to claim 4, wherein the perimeter corners (4c) are shaped according to portions having one or more three-dimensional curvatures in space.

20 7. Container according to any one of the preceding claims, wherein the removable layer (4) comprises stiffening means (6) integrally made in the bottom wall (4a) and/or in the side walls (4b) and/or in the perimeter corners (4c), said stiffening means (6) being constituted by folds and/or ribs formed integrally and seamlessly in delimited portions of the
25 removable layer (4) itself.

8. Container according to any one of the preceding claims, wherein there are also mechanical stabilization means (7) operating between adjacent parts or layers of the removable layer (4) and/or operating between the
30 removable layer (4) and the body (2) to define at least the operating condition of the removable layer (4) itself.

9. Container according to claim 8, wherein said mechanical stabilization means (7) comprise:

- 5 - hooking systems, comprising clips and/or rivets and/or snap buttons and preferably made preferably of radio-transparent material; and/or
- localized shapings and/or folds and/or ultrasonic weldings interposed between adjacent parts or layers of the planar element constituting the removable layer (4).

10 10. Container according to any one of the preceding claims, wherein the

removable layer (2) comprises further gripping and handling means (5) suitable for allowing a grip by a user of the container (1).

11. Container according to claim 10, wherein also present are:

- 15 - means for univocal identification of the container (1) and/or of the objects placed in the container (1), said means being preferably constituted by RFID and/or NFC devices; and
- means for static or dynamic display of messages and/or information reported on the surface of the removable layer (4) and/or on the body (2).