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(54) **HEXA BOX**

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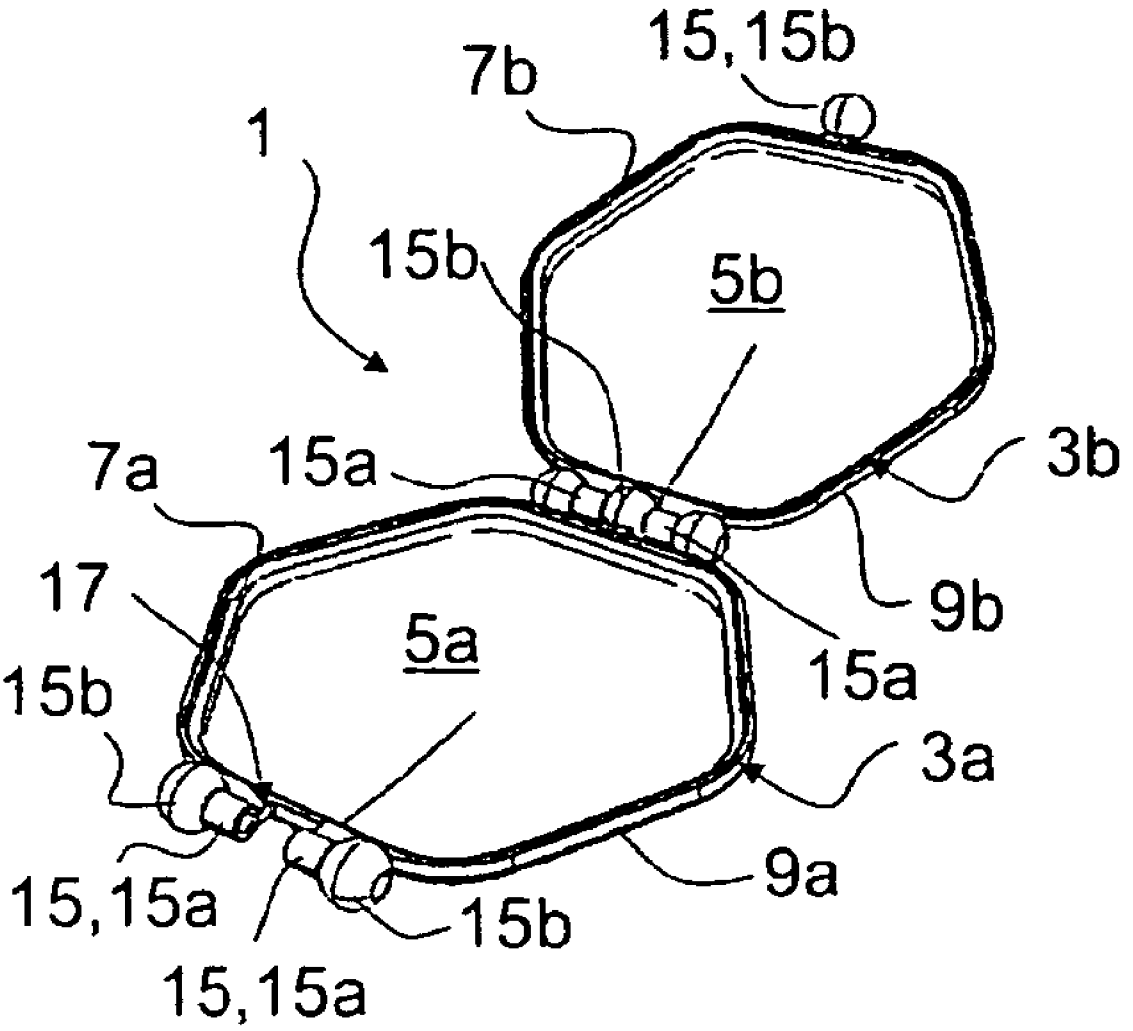
(57) **ABSTRACT**

The container (**1**) comprises two half-shells (**3***a*, **3***b*). On the edges of the half-shells (**3***a*, **3***b*) at least one male coupling element (**15***b*) and at least two female coupling elements (**15***a*) are formed. The half-shells (**3***a*, **3***b*) can be plugged together in an arbitrary manner to form containers (**1**) or other structures, in that male coupling elements (**15***b*) are engaged in gaps (**17**) between two adjacent female coupling elements (**15***a*).



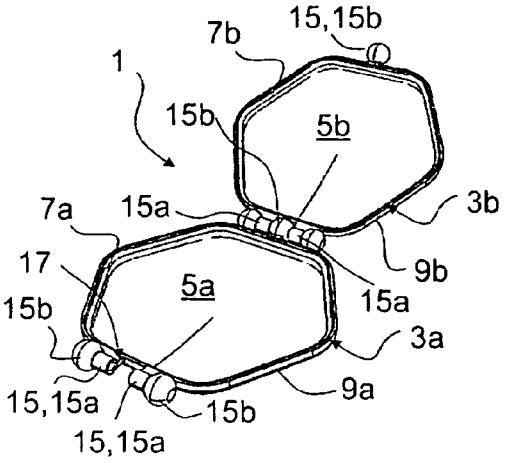


Fig. 1

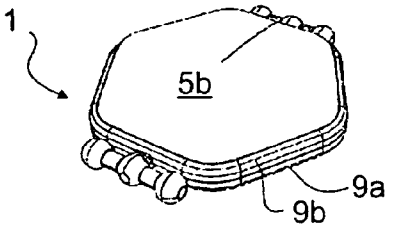


Fig. 2

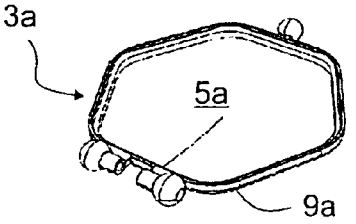


Fig. 3

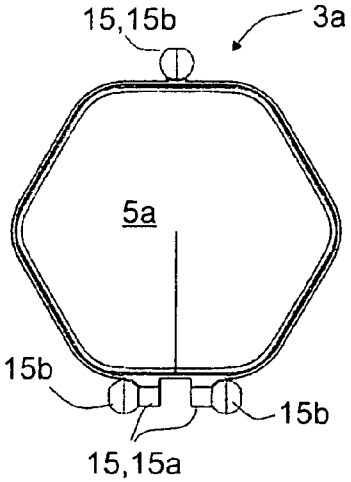


Fig. 4

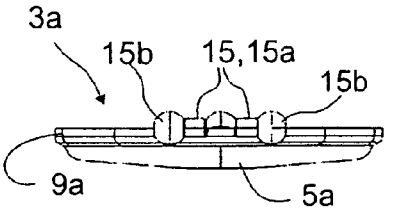


Fig. 5

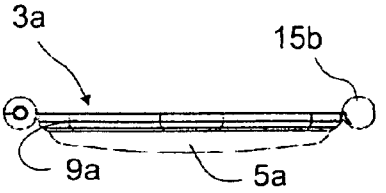


Fig. 6

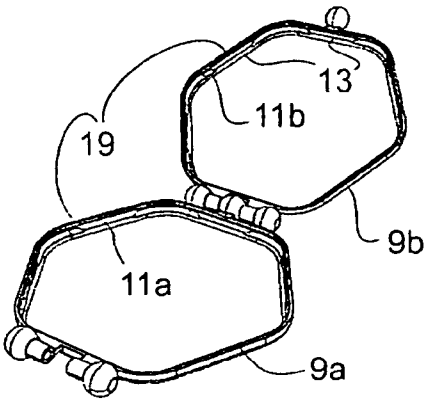


Fig. 7

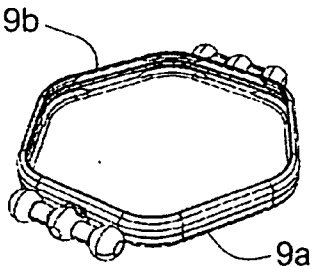


Fig. 8

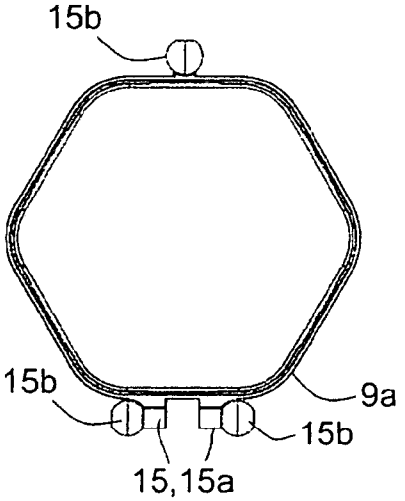


Fig. 9

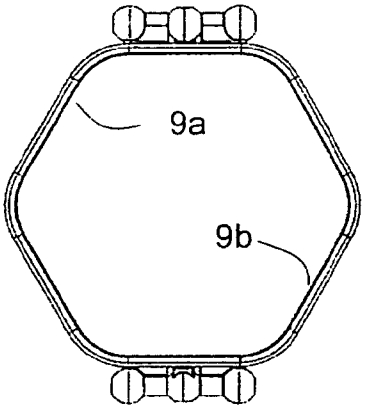


Fig. 10

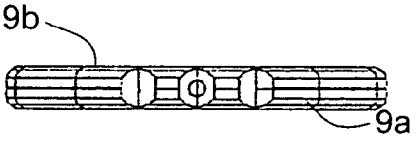


Fig. 11

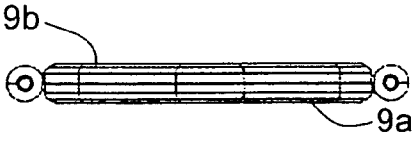


Fig. 12

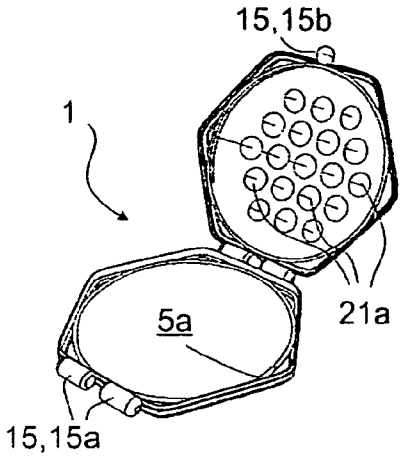


Fig. 13

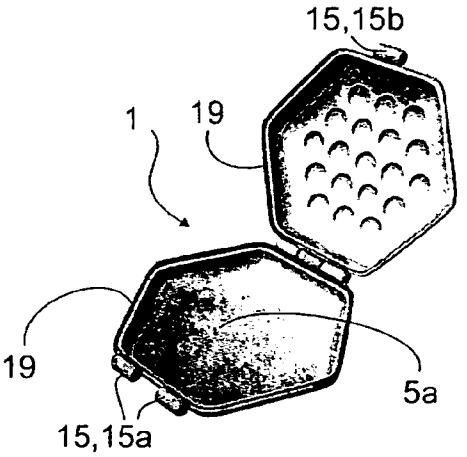


Fig. 14

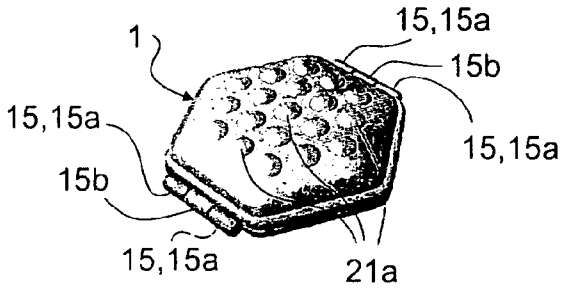


Fig. 15

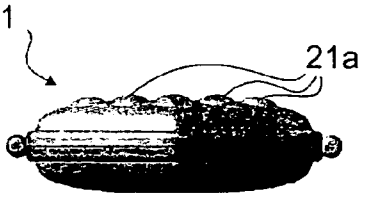


Fig. 16

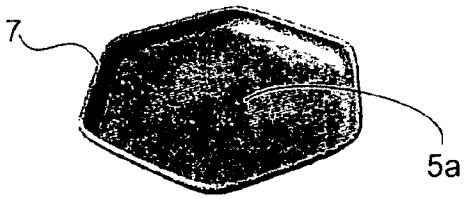


Fig. 17

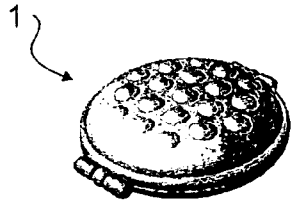


Fig. 18

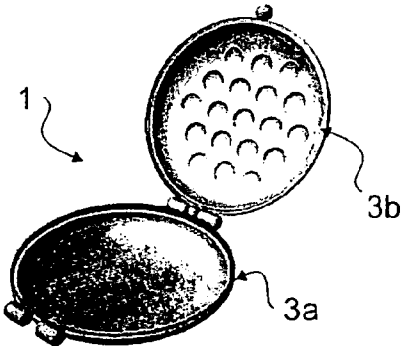


Fig. 19

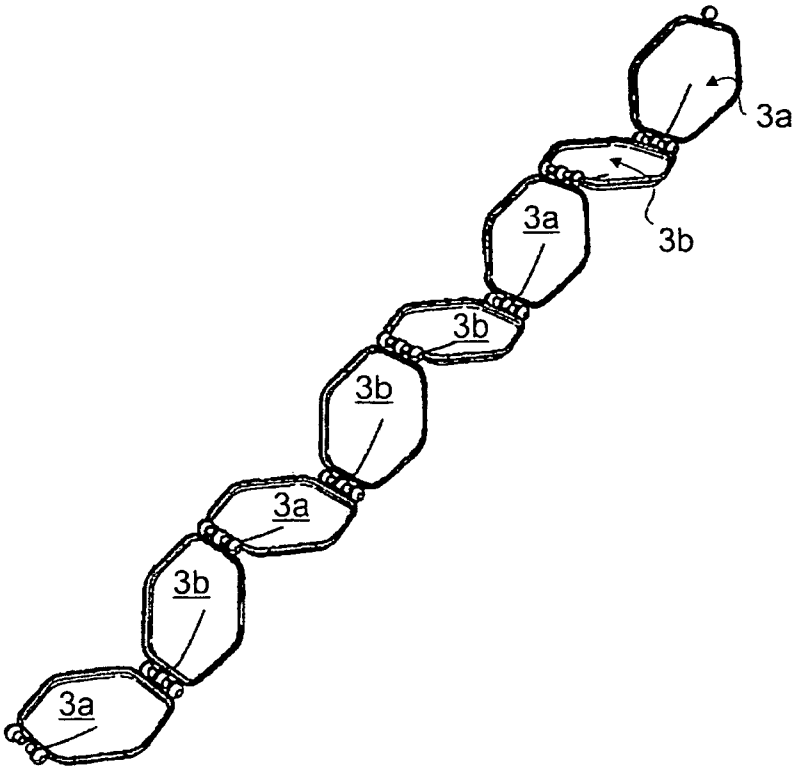


Fig. 20

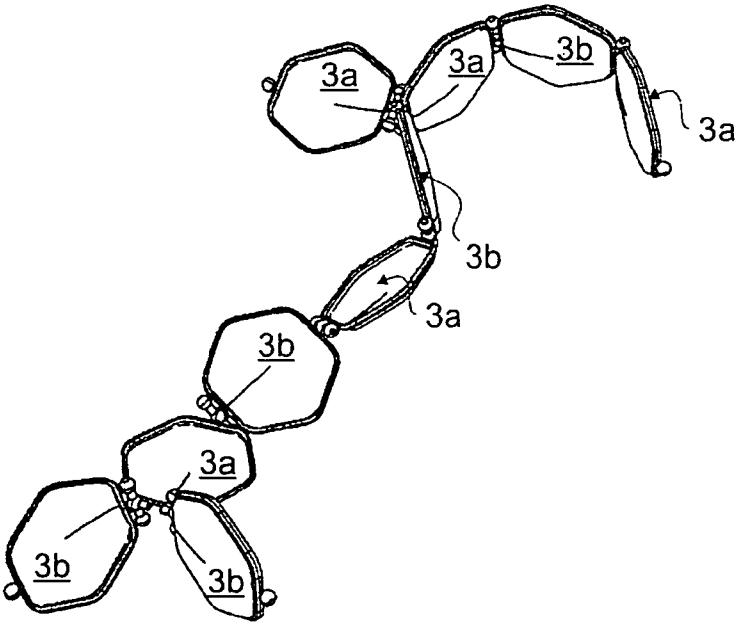


Fig. 21

HEXA BOX

RELATED APPLICATION

[0001] This application claims priority of Swiss Patent Application No. 01160/05 filed Jul. 13, 2005.

FIELD OF THE INVENTION

[0002] The subject matter of the invention is a container with a seal according to the features of claim **1**.

BACKGROUND OF THE INVENTION

[0003] Containers for tablets, lozenges, candies, medicine, cosmetics, and the like are known in a wide range of configurations. They are used as storage containers and protect their contents from external effects. However, containers are used not only for storing and protecting their contents.

[0004] They play an important role in marketing and sales as visible packaging elements that are noticeable by potential customers. Properties, such as size, shape, color, material, surface, etc., allow countless combinations and constructions with very different effects.

[0005] From U.S. Pat. No. 3,999,327, it is known to configure containers such that, at least at the beginning, they have the shape of animals, which is made clearer by a corresponding painting or printing, and such that they can be stacked in various ways. Such containers can also be used as children's toys.

[0006] From U.S. Pat. No. 5,503,288, a recloseable container with two half-shells is known, wherein the second half-shell can be placed over the first half-shell like a cap for sealing the container. One half-shell contains one or more lips, which project on the outside and which engage in one or more grooves shaped correspondingly on the inside of the other half-shell for sealing the container. In at least one of the half-shells, male and female engagement devices, which can have the shape, e.g., of dovetail-like tongues and grooves, are formed on the outside. By sliding the corresponding engagement devices of two or more adjacent half-shells one into the other, these half-shells can be assembled into different multiple container structures.

[0007] For joining and separating the containers, the top half-shells or covers must be removed, because these partially cover the end openings of the grooves. For a single container, the engagement devices dominate its appearance. They are also viewed as engagement devices, whose single task is to connect several half-shells to each other. Half-shells with such engagement devices are usually manufactured completely from plastic. For connecting half-shells by means of dovetail-like engagement devices, flat, smooth sections are required on the half-shells. Therefore, the structural range in terms of possible shapes is greatly limited. In addition, this type of engagement device is not suitable for containers with a small overall height, e.g., flat containers.

SUMMARY OF THE INVENTION

[0008] The problem of the invention is to create a container containing two half-shells with a seal and with means for coupling half-shells.

[0009] This problem is solved by a container with a seal according to the features of claim **1**.

[0010] The containers according to the invention can be produced both in plastic and also as high-quality metal containers with sealing and coupling elements made from plastic. Simultaneously, the sealing elements also have the function of coupling elements. Thanks to this multiple functionality, no separate coupling elements are required, which could negatively affect the appealing and balanced design of the containers. The cylindrical and/or spherical structure of the sealing and coupling elements allows pivoting and rotating movements of two half-shells connected or coupled with each other. At the edge of each half-shell, two spaced female coupling elements are arranged on one side and one male coupling element is arranged diametrically opposite on the other side. Two half-shells can be joined to form one container, in that the male coupling element of each half-shell is engaged or clamped between the two elastically pliant female coupling elements of the other respective half-shell. The spherical or cylindrical male coupling elements with convex end regions are centered between the concave end regions of the female coupling elements and can rotate or pivot analogously to a hinge. For opening the container, the male coupling element must be released from the clip on one of the two sides. Due to the symmetric construction, the container can be released on either of the two sides with the coupling elements and pivoted about the opposite hinge. By releasing both coupling connections, the half-shells can also be separated completely. The half-shells of several containers can also be used as plugs, in that they can be plugged together in arbitrary ways to form chains or other structures. In a preferred configuration, the female coupling elements also include a section that is constructed analogous to the male coupling elements. In this way, the range of structures increases when the half-shells are plugged together. Thanks to the small spatial requirements of the coupling elements, the containers can have a relatively flat construction, so that they can find space in a pants or jacket pocket without causing interference. Obviously, containers of greater volume can also be constructed according to the present invention.

[0011] In principle, the containers can have any shape in top view. Preferably, however, a symmetric polygonal shape with an even number of edges is selected, because in this way, the coupling elements can be arranged on opposite edges in a non-interfering way, and because in this way, the arrangement of the coupling elements is identical for all of the half-shells. Also suitable are oval or circular or ellipsoid half-shells (in top view). In principle, several pairs of diametrically opposite coupling elements can also be arranged at the edges of the half-shells. For example, alternating male and female coupling elements can be formed on each of the edges of a hexagonal half-shell. This configuration increases the security of the seal against unintentional opening. However, then several coupling elements also have to be opened when the container is to be opened. For plugging elements together, the number of possible combinations is increased even more.

[0012] In the case of sheet-metal containers, which usually include two curved sheet-metal parts with flanged edges on the outside, the coupling elements are preferably formed from plastic at the edge of a slightly elastic clamping or seating ring. This can be produced integrally, e.g., as an

injection-molded part in the form of the half-shell edge. Alternatively, first a band with shaped coupling parts can also be produced, which is then formed into a ring, e.g., in the region of one of the coupling elements by means of a latch connection or by adhesion or fusing. Such a ring with coupling elements is placed over each edge of the two sheet-metal parts. A circular groove, in which the flanged edge of the sheet-metal part engages and thus can guarantee the secure retention of the ring on the sheet-metal part, is formed on the inside of this ring. In addition, in the region of the groove, catch elements or other means are provided that overlap and tightly hold the flanged sheet-metal edge inserted into the groove.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention is described in more detail below with reference to several figures. Shown are

[0014] FIG. **1**, a perspective view of an opened container in a first construction with hexagonal container shape and with spherical, male coupling elements,

[0015] FIG. **2**, the container from FIG. **1** in closed state,

[0016] FIG. **3**, the bottom half-shell of the container from FIG. **1** with container base and coupling elements,

[0017] FIG. **4**, a top view of the bottom half-shell from FIG. **3**,

[0018] FIG. **5**, the half-shell from FIG. **3**, viewed from the side of the female coupling elements,

[0019] FIG. **6**, a side view of the half-shell from FIG. **3** viewed perpendicular to the coupling elements,

[0020] FIG. **7**, two joined rings with coupling elements corresponding to FIG. **1** for an opened container, but without a sheet-metal base,

[0021] FIG. **8**, the rings from FIG. **7**, corresponding to the situation in FIG. **2** for a closed container,

[0022] FIG. **9**, a top view of one of the rings from FIG. **7**,

[0023] FIG. **10**, a top view of the joined rings corresponding to the situation in FIG. **8**,

[0024] FIG. **11**, the rings from FIG. **8** in a side view, viewed in the direction of the coupling elements,

[0025] FIG. **12**, the rings from FIG. **8** viewed perpendicular to the coupling elements,

[0026] FIG. **13**, a container with stamped sections in the container cover,

[0027] FIG. **14**, another construction of a container in an opened state with cylindrical male coupling elements,

[0028] FIG. **15**, the container from FIG. **14** in a closed state,

[0029] FIG. **16**, the closed container in FIG. **15** in a side view perpendicular to the coupling elements,

[0030] FIG. **17**, a container base made from metal with an outwards-flanged edge,

[0031] FIG. **18**, another construction of a container with round half-shell form in the closed state,

[0032] FIG. **19**, the container from FIG. **18**, but opened,

[0033] FIG. **20**, a first structure made from plugged-together container elements in a chain form,

[0034] FIG. **21**, a second structure made from plugged-together container elements.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0035] FIG. **1** shows an example first construction of a container **1** or, in general, a container with a first half-shell **3***a* including a container base **5***a* and a second half-shell **3***b* including a container cover **5***b* in the opened state. In FIGS. **2** to **12** and **17**, other views of the container **1** from FIG. **1** or of parts of this container **1** are shown. The container base **5***a* and container cover **5***b* are made from sheet metal in these embodiments. In a top view, they have the form of a regular hexagon with rounded corners and include an outwards-flanged edge **7**, as described in FIG. **17**. The edges **7***a*, **7***b* are bordered or clamped by preferably slightly elastic, ring-like carrier bands **9***a*, **9***b*. Peripheral grooves **11***a*, **11***b* (FIGS. **7** and **8**), which are used as holders for the complementary flanged edges **7***a*, **7***b*, are removed from the inner surfaces of these carrier bands **9***a*, **9***b*. Additionally, catch elements **13** or other means that overlap and fix the flanged sheet-metal edge **7***a*, **7***b* inserted into the groove **11***a*, **11***b*, can be provided in the region of the grooves **11***a*, **11***b*. The half-shells **3***a*, **3***b* or their edges **7***a*, **7***b* impart additional dimensional stability to the carrier bands **9***a*, **9***b* placed on top. On each of the carrier bands **9***a*, **9***b*, several outwards projecting coupling elements **15** are formed, wherein at least two female coupling elements **15***a* and at least one male coupling element **15***b* are provided. The female coupling elements **15***a* are arranged slightly offset relative to each other in the band direction, so that a gap **17** is produced in between. Each of the carrier bands **9***a*, **9***b* is arranged on the respective edge **7***a* and **7***b* of the container base **5***a* and the container cover **5***b*, respectively, such that the gap **17** and the male coupling element **15***b* are arranged in the center of diametrically opposite sides of the respective edge **7***a*, **7***b*.

[0036] The female coupling elements **15***a* have, e.g., a tubular or cylindrical construction with concave recesses on the ends in the region of the gap **17**. In this way, a type of socket for a ball and socket joint is formed. In an alternative configuration, the half-shells **9***a*, **9***b* can also be made from plastic, wherein the coupling elements **15** are then formed directly on the edges **7** of these half-shells **9***a*, **9***b*.

[0037] The ends of the female coupling elements **15***a* facing away from the gap **17** are formed as spherical or bead-shaped male coupling elements **15***b* in the first configuration according to FIGS. **1** to **12**. In an alternative configuration, as shown in FIGS. **14** to **16**, no male coupling elements **15***b* are provided connected laterally to the female coupling elements **15***a*, and the male coupling elements **15***b* have the shape of cylindrical rods with convex curved ends. As shown, e.g., in FIGS. **1** to **14**, the male coupling element **15***b* of the second half-shell **3***b* can be pressed or clicked into the gap **17** between two female coupling elements **15***a* of the first half-shell **3***a*, such that an articulated connection is produced between the two half-shells **3***a*, **3***b*. In the first configuration, the spherical male coupling elements **15***b* have two degrees of freedom for rotational movements in the socket of a ball and socket joint. In the second configuration with rod-shaped male coupling elements **15***b*, in

contrast, there is only one degree of freedom, analogous to a hinge, which allows folding and unfolding or simple pivoting movements of the container cover **5***b*. The dimensions of the male coupling elements **15***a* are adapted to the dimensions of the female coupling elements **15***a* or to the gap **17** formed by the female coupling elements **15***a*, so that the male coupling elements **15***b* can be engaged or clicked into the gap **17** under elastic yielding of the female coupling elements **15***a*. The convex curved regions of the male coupling elements **15***b* are then in positive or non-positive contact with the concave curved or tubular end regions of the female coupling elements **15***a*. The female coupling elements **15***a* have a centering effect on the male coupling elements **15***b*. The dimensions and materials are designed so that the plugged or coupled together half-shells **3***a*, **3***b* do not change their mutual position due to frictional forces of the coupling elements **15***a*, **15***b*, even for the effect of small forces or moments, but so that their mutual position can be changed easily by the force of the fingers of one hand.

[**0038**] For sealing the container **17** the free male coupling elements **15***b* of each of the two half-shells **3***a*, **3***b* are snapped into the corresponding gaps **17** between the female coupling elements **15***a* on the other respective half-shell **3***b*, **3***a*. The edges of the half-shells **3***a*, **3***b* or of the carrier bands **9***a*, **9***b* bordering each other when the container **1** is closed are formed as sealing edges **19**, which include, e.g., sealing lips or edge regions that overlap when the container **1** is closed. FIGS. **2**, **15**, **16**, and **18** show such closed containers. In FIGS. **7** to **12**, only the crier bands **9***a*, **9***b* with the coupling elements **15** are shown, but not the container base **5***a* and the container cover **5***b*. Correspondingly, FIG. **8** shows the situation for a closed container **1** without the sheet-metal parts.

[**0039**] In other embodiments of the container **1**, the sheet-metal parts can include impressions or stamped sections **21** (FIGS. **13** to **16**, **18** and **19**) in addition to the half-shell form. These improve, on one hand, the stability of the container **1** and can also impart a unique design to the container **1**. In addition, the container surfaces can be printed or colored in some other way. In particular, the impressions and/or stamped sections **21** can have a pellet-like construction and can be painted with one or more different colors. Likewise, there is the possibility of printing the containers with different letters or motifs, which then can be lined up to form chains of letters or words or motif combinations at a later time.

[**0040**] In the embodiment according to FIGS. **18** and **19**, the half-shells **3***a*, **3***b* have a rounded edge.

[**0041**] In FIGS. **20** and **21**, it is shown as an example how the half-shells **3***a*, **3***b* of several containers **1** can be plugged together to form chains or other structures in an arbitrary way. Here, the male coupling elements **15***b* of one half-shell **3***a*, **3***b* are inserted into the gaps **17** between two female coupling elements **15***a* of an adjacent half-shell **3***a*, **3***b*.

[**0042**] In addition to the half-shells **3***a*, **3***b*, connection elements, e.g., triangular or differently configured frames with several projecting coupling elements **15***a*, **15***b* can be provided, which further increases the range of shapes when parts are joined together (not shown). Additional elements, e.g., mirrors, can also be embodied, so that they can be fixed, e.g., in the grooves **11***a*, **11***b* in the half-shells **3***a*, **3***b* (not shown).

[**0043**] The containers **1** can include, e.g., first-use protection in the form of a removable plastic film in the interior (not shown).

1. A box comprising a first half portion and a second half portion wherein on an edge of each of the first half portion and the second half portion at least one male coupling element and at least two female coupling elements are formed.

2. The box of claim 1 wherein the at least one the male coupling element on one of the first half portion and the second half portion is constructed with ball-like or staff-like form with convex curved terminal edges.

3. The box of claim 1 wherein the at least two female coupling elements on one of the first half portion and the second half portion have a tubing-like form or concave curved terminal edges.

4. The box of claim 1 wherein the at least two female coupling elements on one of the first half portion and the second half portion are arranged in a proximal manner to provide a ball and socket joint adapted to receive a male coupling element.

5. The box of claim 1 wherein the at least one male coupling element and the at least two female coupling elements on one of the first half portion and the second half portion are formed of plastic on a supporting belt.

6. The box of claim 5 wherein the supporting belt has ring-like form having a groove for the admission of a flanged edge.

7. The box of claim 1 wherein one of the first half portion and the second half portion is formed of plastic and the at least one male coupling element and the at least two female coupling elements are formed in the edge of one of the first half portion and the second half portion.

8. The box of claim 2 wherein the at least two female coupling elements on one of the first half portion and the second half portion have a tubing-like form or concave curved terminal edges.

9. The box of claim 2 wherein the at least two female coupling elements on one of the first half portion and the second half portion are arranged in a proximal manner to provide a joint seat opening adapted to receive a male coupling element.

10. The box of claim 3 wherein the at least two female coupling elements on one of the first half portion and the second half portion are arranged in a proximal manner to provide a joint seat opening adapted to receive a male coupling element.

11. The box of claim 2 wherein the at least one male coupling element and the at least two female coupling elements on one of the first half portion and the second half portion are formed of plastic on a supporting belt.

12. The box of claim 3 wherein the at least one male coupling element and the at least two female coupling elements on one of the first half portion and the second half portion are formed of plastic on a supporting belt.

13. The box of claim 4 wherein the at least one male coupling element and the at least two female coupling elements on one of the first half portion and the second half portion are formed of plastic on a supporting belt.

14. The box of claim 2 wherein one of the first half portion and the second half portion is formed of plastic and the at least one male coupling element and the at least two female

coupling elements are formed in the edge of one of the first half portion and the second half portion.

15. The box of claim 3 wherein one of the first half portion and the second half portion is formed of plastic and the at least one male coupling element and the at least two female coupling elements are formed in the edge of one of the first half portion and the second half portion.

16. The box of claim 4 wherein one of the first half portion and the second half portion is formed of plastic and the at least one male coupling element and the at least two female coupling elements are formed in the edge of one of the first half portion and the second half portion.

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