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(54) PACKAGE AND METHOD FOR PACKAGING OBJECTS SUCH AS ZINC AIR BATTERIES

VERPACKUNG UND VERFAHREN ZUM VERPACKEN VON GEGENSTÄNDEN WIE ZINK-LUFT
BATTERIEN

EMBALLAGE

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GB-A- 1 426 715 **US-A- 3 399 509**
US-A- 4 209 091

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Description

[0001] This invention is concerned with packaging. It is sometimes desirable to package several articles individually within a common pack to enable the consumer to remove the articles in turn for use. The invention relates in particular to the packaging of small batteries as may be used to power personal appliances such as hearing aids. In the case of appliances, like hearing aids, which tend to be used continuously, battery life is relatively short and users generally wish to carry spare batteries with them and to purchase batteries several at a time, for example in packs of four or six batteries. It is known, therefore, to package batteries in groups of 4 or 6 in plastic cases for sale to customers. A type of small battery well suited to appliances such as hearing aids is a zinc air battery. A zinc air battery includes a small air hole in its metal casing and the air hole must be exposed for the battery to function. However, even if the battery is not being used to power an appliance, it can lose its power, typically in about three months, if the air hole is exposed. For this reason it is necessary for the air hole to be sealed closed from the time of manufacture of the battery until it is to be fitted into an appliance.

[0002] EP-A-0 529 199 discloses a push-through, blister card package for zinc-air batteries including a cardboard support to which is sealed a transparent plastic foil with cup-shaped recesses for holding button cells. The battery bases, which are provided with air supply holes, are attached to a shared adhesive foil. When a battery is pushed through the support, which is perforated in the region for battery removal, the adhesive foil automatically detaches from the battery while remaining an integral part of the package.

[0003] US-A-4 209 091 discloses a button cell package with hingedly connected cover and base portions in which button cells are releasably retained in position by an adhesive surface layer on a laminated structure having a resilient layer between the adhesive layer and a nonresilient base. An additional layer having preferential barrier properties is used with cells of the metal-air type and is located between the adhesive surface layer and the resilient member. The adhesive layer seals the metal-air cell to increase cell shelf life and prevents inadvertent dislodgement and loss of cell capacity, yet permits small amounts of evolved hydrogen to diffuse from the cell. The resilient layer serves as a cushion and provides a means for obtaining maximum surface contact between the adhesive surface layer and the button cell surface to maintain the cell in impact-resistant, releasable adhesive contact with the adhesive layer.

[0004] A technique which has been used for the packaging of DURACELL ACTIVAIR zinc air batteries is to cover the air hole by applying an adhesive plastics disc to the battery, this disc having a tab portion which protrudes beyond the edge of the battery for ease of grasping the disc for removal from the battery when the battery is required for use. The known DURACELL ACTI-

VAIR battery package, which hold e.g. 4 or 6, batteries equipped with their individual sealing discs, comprises a plastics container including a base formed with pockets to receive and retain the respective batteries, and a cover hinged to the base for movement between a closed position in which the cover and base form an enclosure enclosing the batteries, and an open position providing access to the enclosed batteries for removal of individual batteries. Whilst these battery packages are quite convenient for consumers, they are not without drawbacks from a manufacturing viewpoint. Batteries with the sealing discs applied thereto make automated filling of the containers difficult to achieve and as a consequence it has been the practice to load the batteries into the pockets of the container base manually, which is inefficient.

[0005] The present invention addresses the foregoing drawback and as a solution it proposes a package comprising a base with a plurality of pockets, respective articles being received in the pockets, and a unitary element of flexible sheet material including a spine portion adhered to the base, and an article covering portions connected to the spine portion and extending over respective pockets, the covering portions being adhesively connected to the articles received in the pockets.

[0006] Where the articles are batteries, in particular zinc air batteries, the covering portions will cover and seal closed the air holes of the batteries until they are required for use. As the unitary sheet material element is adhesively attached to the base, it can assist in retaining the batteries in their pockets, which means that the pockets themselves are not solely responsible for keeping the batteries in place and, therefore, need not grip the batteries firmly, thereby allowing the pockets to be formed to broader manufacturing tolerances and possibly enabling easier removal of individual batteries from their pockets. When a battery is required for use, it is lifted from its pocket, the flexibility of the sheet element permitting such removal, and the battery is peeled away from the covering portion to which it is adhesively attached. To assist the battery removal the covering portions of the sheet element preferably include tabs which project in a direction away from the spine portion. By holding a tab in the fingers and pulling it away from the base, the associated covering portion will be deflected and lift the battery adhered thereto from its pocket.

[0007] The use of a unitary element of flexible sheet material to cover the batteries facilitates automation of the packaging process since such an element can be applied by a conventional labelling machine after the batteries have been loaded into the pockets, which in turn means that the batteries can be simultaneously loaded into the pockets by means of an automated filling machine.

[0008] In accordance with one aspect of the invention, there is provided a package comprising:

a base with a plurality of pockets, adapted to receive

articles therein; and

a unitary element of flexible sheet material including a spine portion adhered to said base, article covering portions comprising a portion of said flexible sheet connected to the spine portion and extending over the respective pockets, the covering portions being adhesively connected to the articles received in the pockets and being strippable from said articles; characterized by
a cover over said covering portions of said flexible sheet, said cover being removable from said covering portions of said flexible sheet.

[0009] In accordance with a second aspect of the invention there is provided a method of packaging articles characterized by comprising the steps of:

- i) providing a base having a plurality of separate pockets for accommodating respective articles;
- (ii) loading articles into the pockets by means of an automated filling machine;
- (iii) applying a unitary element of flexible sheet material over the base and the articles loaded into the pockets by means of an automated labelling machine, the element including a spine portion adhesively attached to the base (2), and article covering portions (17) adhesively attached to the respective articles; and
- (iv) providing a cover over said covering portions of said flexible sheet, said cover being removable from said covering portions of said flexible sheet.

[0010] Most conveniently the flexible sheet elements are supplied to the labelling machine in the form of a strip with a series of elements carried on a backing web.

[0011] A more detailed description of the invention will now be given with reference to the accompanying drawings, in which:

Figure 1 shows in perspective a zinc air battery package embodying the invention, the package being shown in a closed condition;

Figure 2 shows the package of Figure 1 in an open condition and in front elevation;

Figures 3 and 4 show the package of Figure 2 in plan and side elevation, respectively;

Figure 5 is a front elevation of the container base before the pockets are filled with batteries; and

Figure 6 shows schematically an apparatus for performing the packaging process.

[0012] The zinc air battery package illustrated in the drawing includes a plastics container 1 moulded in one piece and including a base 2 and a cover 3 connected to the base by an integral hinge 4 to allow the cover to move between the closed and open positions shown in Figures 1 and 2 respectively. To maintain the cover in the closed condition complementary snap-catch forma-

tions 5, 6 are provided at the edges of the base and cover remote from the hinge 4. The container base 2 is formed on its inner or upper side with a slightly raised platform or plinth 10 on which is an upstanding longitudinal rail 11 defining a substantially flat upper surface 9 (Fig. 5). On either side of the rail 11 there are formed pockets 12 (Fig. 5) in which respective zinc air batteries 14 are accommodated. As shown there are a total of six pockets arranged in three pairs, the pockets 12 of each pair being laterally opposed with respect to the rail 11. The batteries 14 are conventional and cylindrical in shape. When inserted into the pockets 12 the upper flat faces of the batteries, these being the faces in which the air holes are provided, lie substantially coplanar with the upper surface of the rail 11. Applied over the base 2 and the batteries 14 accommodated in the pockets is a unitary element 15 of flexible plastics sheet material. The element includes a spine portion 16 which overlies and is adhesively connected to the upper surface 9 of the rail 11. Extending from the spine portion are six covering portions 17 disposed to overlie the respective pockets 12 and the batteries 14 received therein. These covering portions 17 are adhesively attached to the respective underlying batteries 14. Each covering portion has a tab 18 projecting in a direction opposite the spine portion 16 beyond the edge of the associated battery 14 and the pocket 12 in which it is received. Although the material of the sheet element 15 is flexible it has sufficient stiffness to maintain the substantially flat condition in which it is applied over container base 2 and batteries 14, and hence the sheet element 15 assists in retaining the batteries on the base in spite of the batteries having a loose fit in the pockets. When an individual battery is required for use, the tab 18 of the covering portion 17 to which the battery is attached is manually grasped, e.g. between the thumb and forefinger and moved away from the base 2, whereby the battery 14 is lifted out of its pocket 12, the element 15 naturally bending at the join between the spine and covering portions 16, 17. The battery is then peeled away from the covering portion 17, the adhesive allowing this to be achieved without undue difficulty.

[0013] It will be appreciated that modifications can be made to the described package without departing from the inventive principles. In particular the shape and size of the pockets can be varied to suit the particular batteries to be packaged. Of course, the number of pockets will be chosen according to the number of batteries to be included in the package.

[0014] The described package can be produced by the following process. The moulded containers 1 are fed to an automated filling machine 20 (Fig. 6) which is also supplied with batteries 14. The filling machine simultaneously fills the pockets 12 of the container base by loading respective batteries 14 into the pockets 12, the batteries all having their surfaces with the air holes uppermost. The containers with batteries loaded therein are delivered in turn to an automated labelling machine

21 which applies the sheet element 15 onto the container base 2 and batteries 14 so that it covers and is adhesively secured to the upper surfaces of the rail 1 and the batteries. The sheet elements 15 are supplied to the labelling machine as a strip, e.g. supplied from a roll, the strip including a backing web 22 on which the elements 15 are carried and to which they are removably attached by the same adhesive used to secure the elements to the container base and the batteries. The labelling machine removes individual elements from the backing web before the labelling machine removes individual elements from the backing web before applying them.

[0015] While it is apparent that modifications and changes can be made within the scope of the present invention, it is our intention however, only to be limited by the appended claims.

Claims

1. A package comprising:

a base (2) with a plurality of pockets (12), adapted to receive articles therein; and
a unitary element (15) of flexible sheet material including a spine portion (16) adhered to said base (2), article covering portions (17) comprising a portion of said flexible sheet connected to the spine portion (16) and extending over the respective pockets (12), the covering portions (17) being adhesively connected to the articles received in the pockets (12) and being strippable from said articles; **characterized by**
a cover (3) over said covering portions (17) of said flexible sheet, said cover (3) being removable from said covering portions (17) of said flexible sheet.

2. A package according to claim 1, further comprising:

a container (1) including said base (2), and said removable cover (3) said cover (3) being movable relative to the base (2) to open and close the container (1), and wherein said articles are batteries (14) received in respective pockets (12).

3. A package according to claim 1 or 2, wherein the covering portions (17) are arranged in opposed pairs extending from opposite sides of the spine portion (16).

4. A package according to any of claims 1-3, wherein each covering portion (17) includes a tab (18) projecting therefrom in the direction away from the spine portion (16).

5. A method of packaging articles **characterized by**

comprising the steps of:

- (i) providing a base (2) having a plurality of separate pockets (12) for accommodating respective articles;
- (ii) loading articles into the pockets (12) by means of an automated filling machine (20);
- (iii) applying a unitary element (15) of flexible sheet material over the base (2) and the articles loaded into the pockets (12) by means of an automated labelling machine (21), the element including a portion adhesively attached to the base (2), and article covering portions (17) adhesively attached to the respective articles; and
- (iv) providing a cover (3) over said covering portions (17) of said flexible sheet, said cover (3) being removable from said covering portions (17) of said flexible sheet.

6. A method according to claim 5, which comprises simultaneously loading batteries (14) into the pockets (2).

7. A method according to claim 5 or 6, wherein the automated labelling machine (21) is supplied with a series of flexible elements (15) carried on a backing web (22).

Patentansprüche

1. Gehäuse, das folgendes umfasst:

eine Basis (2) mit einer Mehrzahl von Taschen (12), die darin Gegenstände aufnehmen können;

und

ein unitäres Element (15) aus einem flexiblen Lagenmaterial mit einem an der genannten Basis (2) haftenden Rückenabschnitt (16), Abschnitten (17) zum Abdecken von Gegenständen, mit einem Teilstück der genannten flexiblen Lage, das mit dem Rückenabschnitt (16) verbunden ist und sich über die entsprechenden Taschen (12) erstreckt, wobei die Abdeckabschnitte (17) eine Klebeverbindung mit den in den Taschen (12) aufgenommenen Gegenständen aufweisen und von den genannten Gegenständen abgezogen werden können, **gekennzeichnet durch:**

eine Abdeckung (3) über den genannten Abdeckabschnitten (17) der genannten flexiblen Lage, wobei die genannte Abdeckung von den genannten Abdeckabschnitten (17) der genannten flexiblen Lage entfernt werden kann.

2. Gehäuse nach Anspruch 1, wobei dieses ferner folgendes umfasst:

einen Behälter (1), der die genannte Basis (2) sowie die genannte entfernbare Abdeckung (3) aufweist, wobei die genannte Abdeckung (3) im Verhältnis zu der Basis (2) beweglich ist, um den Behälter (1) zu öffnen und zu schließen, und wobei es sich bei den genannten Gegenständen um Batterien (14) handelt, die in entsprechenden Taschen (12) aufgenommen werden.

3. Gehäuse nach Anspruch 1 oder 2, wobei die Abdeckabschnitte (17) in entgegengesetzten Paaren angeordnet sind, die sich von entgegengesetzten Seiten des Rückabschnitts (16) erstrecken.

4. Gehäuse nach einem der Ansprüche 1 bis 3, wobei jeder Abdeckabschnitt (17) einen von diesem in eine von dem Rückenabschnitt (16) weggehende Richtung vorstehenden Ansatz (18) aufweist.

5. Verfahren zur Verpackung von Gegenständen, wobei das Verfahren **dadurch gekennzeichnet ist, dass** es die folgenden Schritte umfasst:

(i) Vorsehen einer Basis (2) mit einer Mehrzahl einzelner Taschen (12) zur Aufnahme entsprechender Gegenstände;
 (ii) Laden von Gegenständen in die Taschen (12) durch eine automatische Füllmaschine (20);
 (iii) Auftragen eines unitären Elements (15) aus einem flexiblen Lagenmaterial über der Basis (2) und den durch eine automatische Etikettierungsmaschine (21) geladenen Gegenständen, wobei das Element einen Abschnitt aufweist, der klebend an der Basis (2) angebracht ist, und wobei Abschnitte (17), die Gegenstände abdecken, haftend an den entsprechenden Gegenständen angebracht sind; und
 (iv) Vorsehen einer Abdeckung (3) über den genannten Abdeckabschnitten (17) der genannten flexiblen Lage, wobei die genannte Abdeckung (3) von den genannten Abdeckabschnitten (17) der genannten flexiblen Lage entfernt werden kann.

6. Verfahren nach Anspruch 5, welches das gleichzeitige Laden von Batterien (14) in die Taschen (2) umfasst.

7. Verfahren nach Anspruch 5 oder 6, wobei die automatische Etikettiermaschine (21) mit einer Reihe flexibler Elemente (15) versorgt wird, die auf einer Trägerbahn (22) getragen werden.

Revendications

1. Emballage comprenant :

une base (2) ayant une pluralité d'alvéoles (12) adaptées pour recevoir des articles dans celles-ci ; et
 un élément unitaire (15) en un matériau en feuille flexible comprenant une partie d'arête centrale (16) collée à ladite base (2), des parties de recouvrement d'articles (17) comprenant une partie de ladite feuille flexible reliée à la partie d'arête centrale (16) et s'étendant sur les alvéoles respectives (12), les parties de recouvrement (17) étant attachées par adhésif aux articles logés dans les alvéoles (12) et pouvant être détachées desdits articles ; **caractérisé par**
 un couvercle (3) par-dessus lesdites parties de recouvrement (17) de ladite feuille flexible, ledit couvercle (3) pouvant être séparé desdites parties de recouvrement (17) de ladite feuille flexible.

2. Emballage selon la revendication 1, comprenant en outre :

un coffret (1) comprenant ladite base (2) et ledit couvercle amovible (3), ledit couvercle (3) étant mobile par rapport à la base (2) de façon à ouvrir et fermer le coffret (1), et dans lequel lesdits articles sont des piles (14) logées dans des alvéoles respectives (12).

3. Emballage selon la revendication 1 ou 2, dans lequel les parties de recouvrement (17) sont agencées par paires opposées s'étendant depuis des bords opposés de la partie d'arête centrale (16).

4. Emballage selon l'une quelconque des revendications 1 à 3, dans lequel chaque partie de recouvrement (17) comprend une languette (18) dépassant de celle-ci dans la direction opposée à la partie d'arête centrale (16).

5. Procédé d'emballage d'articles, **caractérisé en ce qu'il** comprend les étapes consistant à :

(i) préparer une base (2) ayant une pluralité d'alvéoles séparées (12) adaptées pour loger des articles respectifs ;
 (ii) charger des articles dans les alvéoles (12) à l'aide d'une machine de remplissage automatisée (20) ;
 (iii) appliquer un élément unitaire (15) en un matériau en feuille flexible sur la base (2) et les articles chargés dans les alvéoles (12) à l'aide d'une machine d'étiquetage automatisée (21),

l'élément comprenant une partie fixée par adhésif à la base (2) et des parties de recouvrement d'articles (17) fixées par adhésif aux articles respectifs ; et

(iv) placer un couvercle (3) sur lesdites parties de recouvrement (17) de ladite feuille flexible, ledit couvercle (3) pouvant être séparé desdites parties de recouvrement (17) de ladite feuille flexible.

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6. Procédé selon la revendication 5, qui comprend l'étape consistant à charger simultanément plusieurs piles (14) dans les alvéoles (2).

7. Procédé selon la revendication 5 ou 6, dans lequel il est délivré à la machine d'étiquetage automatisée (21) une série d'éléments flexibles (15) maintenus sur une bande de support (22).

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FIG. 1

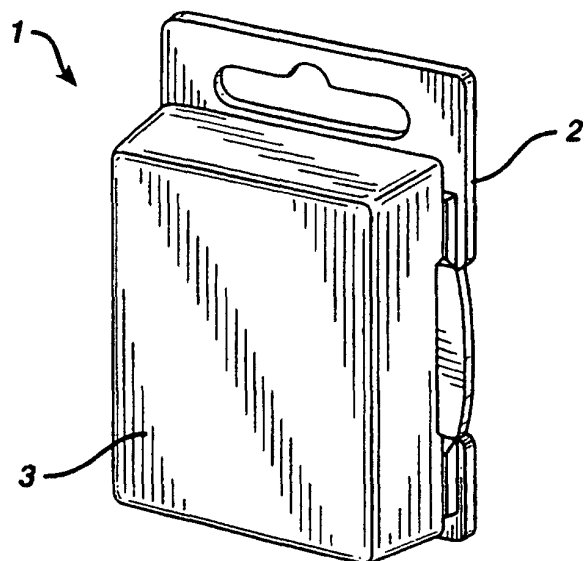


FIG. 2

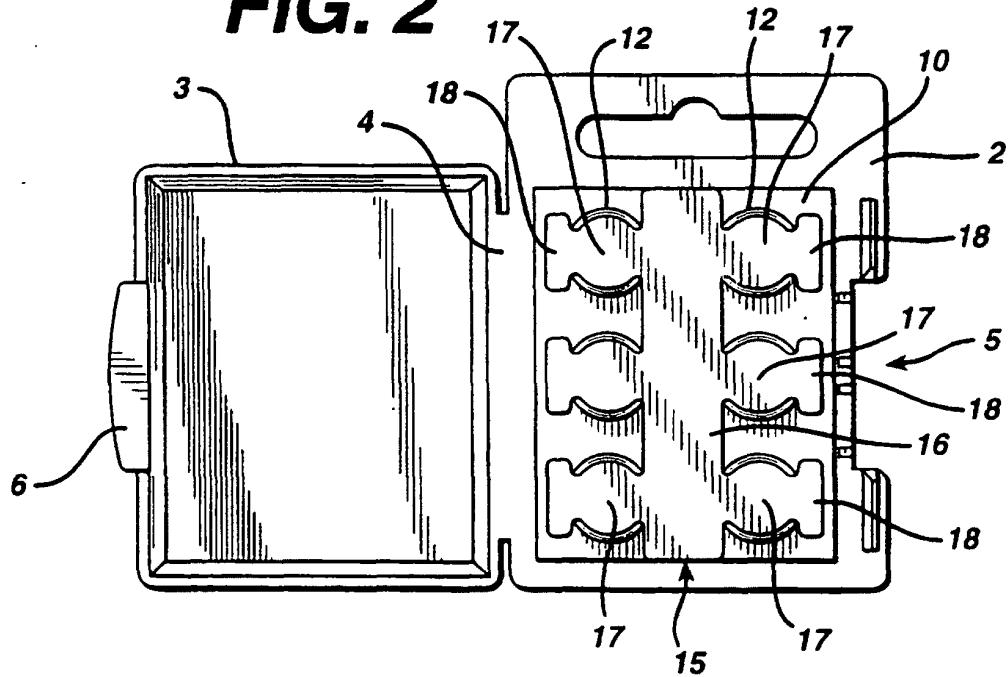


FIG. 3

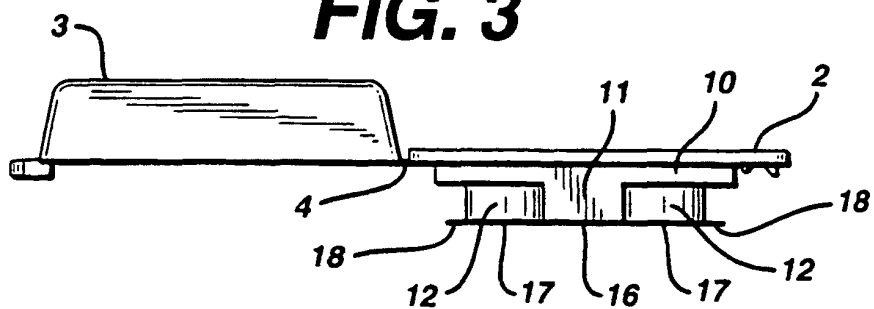


FIG. 4

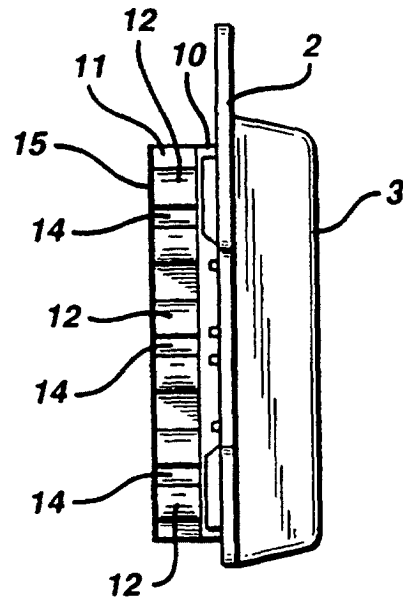


FIG. 5

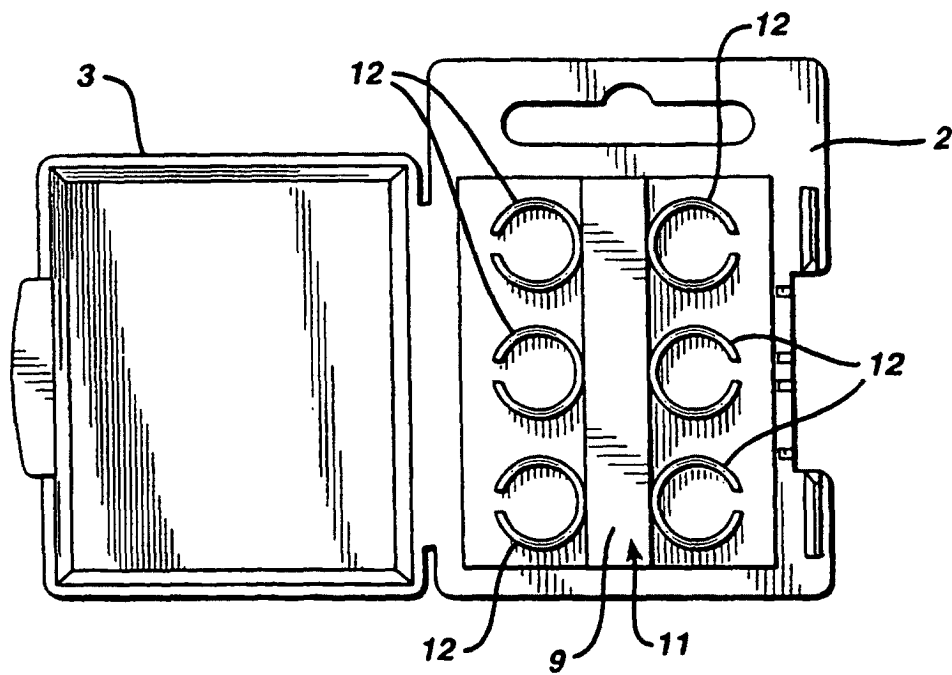


FIG. 6

