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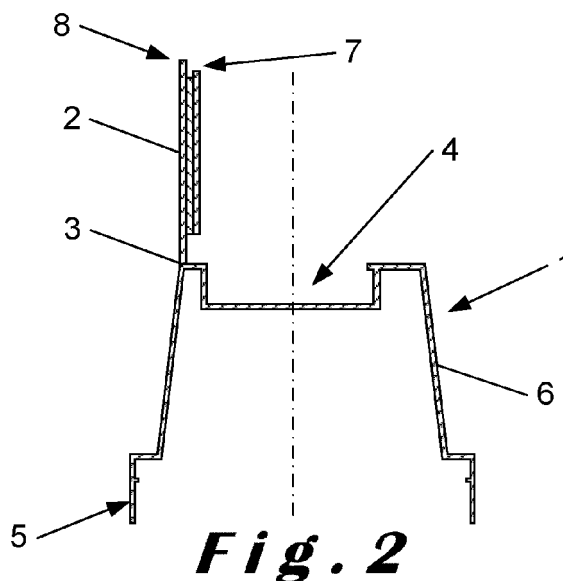
Remarks:

A request for correction of the drawings has been filed pursuant to Rule 139 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 3.).

(54) **Improved disposable container**

(57) A disposable container is described, with as content a composition for polyurethane foam comprising free methylene diphenyl diisocyanate (MDI), and the valve of which is optionally protected by a protective cap (20) which is removably attached to the container, character-

ized in that at least one accessory object, which is of potential interest to the user of the container in which may or may not be packaged, is removably attached by itself or by means of its packaging to the container or the protective cap thereof.



## Description

### FIELD OF THE INVENTION

**[0001]** The present invention is in the field of disposable packagings for products under pressure, preferably for the application of polyurethane foam. The invention is directed more particularly to an improved disposable container containing a composition for polyurethane foam (PU foam), which comprises polymethylenediphenyl diisocyanate, and in which free methylene diphenyl diisocyanate (MDI) monomer may still be present, or to an improved protecting cap for a container with such content. The invention may also be important in the field of technical sprays or paints, or sprays with insecticides and/or herbicides.

### BACKGROUND OF THE INVENTION

**[0002]** Polyurethane foam has many applications, especially in the construction industry. It is widely used as an insulation material, and often for filling up and/or sealing holes and gaps. It is readily applied from a pressurized aerosol, sticks readily to most surfaces, and is in many instances also paintable. Shortly after the application a solid foam is formed which may be cut, so that excessive volume may be readily removed.

**[0003]** For intensive applications, primarily aimed at professionals, preferential use is made of a dispensing gun or any other device which is conveniently held in the hand and usually also allows a precise dosage and application, so that small joints may be readily filled without much waste. Canisters for such use are therefore provided with an especially adapted head or ring, which is arranged around the valve of the pressure container, and which serves for connecting the dispensing gun or other device, which is usually intended to apply the content where necessary. The head or ring usually comprises a protective cap, which protects this valve as a seal over the valve of the container, and which should be removed before use to free up the valve. The dispensing gun may be turned onto the ring on the canister, with a screw thread or a click system, allowing the valve to be simultaneously pressed in the open position and thereby immediately making the dispensing gun ready for use. A suitable and quite easy "Click & Fix" system of a ring and matching dispensing gun is described in WO 98/43894. An improved version of the "Click & Fix" system is described in our unpublished patent application EP-A-10164927.5, filed on June 4, 2010. A system using a screw thread is described in U.S. Patent 5,271,537. An improved version of a threaded coupling piece suitable for dual function is described in our unpublished patent application EP-A-10164924.2, also filed on June 4, 2010.

**[0004]** The containers with polyurethane foam intended for the do-it-yourself user usually have no ring for turning or clicking a dispensing gun onto. The valve is usually free, and the stem thereof may itself be provided with an

external screw thread, upon which a separately sold or included applicator tube or hose may be turned or screwed on, further comprising a lever which by pressing tilts the stem of the valve and thus allows in this way a manual opening of the valve, and when released its closing. For this application, the valve has to be free, and the container for the do-it-yourself user is usually provided with a protecting cap which is removably attached to the container, and which protects the valve until the moment of use.

**[0005]** A main component of all polyurethane foam offered in such kind of disposable canisters is methylene diphenyl diisocyanate (MDI). Typically such a formula contains more than 10% monomeric MDI.

**[0006]** The monomer MDI is a highly reactive molecule. This monomer is also seen as potentially harmful and may cause irritation, for instance in case of skin contact. Because, when spraying the polyurethane foam, all monomer has not completely reacted, there is a risk that the user, via the skin, and especially the hands, becomes exposed to contact with the foam, and hence with the monomer.

**[0007]** Although MDI is still relatively one of the most 'safe' isocyanates, recent studies have led to measures at legislative level, being taken to protect consumers and intended for implementation in the near future.

**[0008]** Thus, in some legal systems MDI will soon be classified as a carcinogen category 3 product according to the DPD and DSD legislation (in full, Dangerous Product Directive also known as Dangerous Substances Directive) and as a Carcinogen Cat. 2 product according to the CLP Regulation (Classification, Packaging and Labeling of Substances and Mixtures). This means that under this legislation all mixtures containing more than 1% monomeric MDI will be accompanied by an indication of, or a label referring to, the R40 sentence according to DSD ("carcinogenic effects are not excluded") or the H351 sentence according to CLP ("Suspected of causing cancer - by inhalation").

**[0009]** Other legislation related to Marketing and Use restrictions will, for example, come in force in the European Union, which requires that all products containing more than 0.1% free MDI monomer may not be offered any more on the consumer market, in other words the do-it-yourself market, without adding per packaging unit protective gloves and without providing the package with the necessary warning phrases. This regulation will amongst others apply to all PU foams in disposable canisters intended for the consumer market.

**[0010]** For the convenience of the user of the PU foam container, it is therefore desirable to deliver at least one, but more preferably a pair of suitable protective gloves along with the container. This is particularly desirable for protecting the do-it-yourself users, as these tend to be less educated in the dangers of the products they use than the professional user, and therefore often may not use any personal protective means when handling substances which may represent potential hazards. It is more-

over desirable for the gloves to be integrated with the container, and preferably in such a way that the presence or absence of the glove is readily noticeable by the user at the moment of purchase of the container and also by the retailer at the moment of sale. For containers intended for use with a dispensing gun the co-supplied gloves are preferably integrated with the container itself. For the containers intended for use with an applicator tube, the co-supplied gloves may also be integrated with the protective cap.

**[0011]** Thus, there is a desire for providing in a convenient way an accessory object, which is of potential interest to the user, of for example a PU foam container, and this integrated with the container or with the protective cap thereof. This aspiration relates primarily to at least one, but preferably to a pair of protective gloves matching the content of the container, but it may relate as well to any other accessory object of potential interest to the user of the container.

## SUMMARY OF THE INVENTION

**[0012]** The invention therefore provides an improved container the content of which comprises a composition for polyurethane foam still comprising free methylene diphenyl diisocyanate (MDI), such as described in any one of the relevant claims, or an improved protective cap for a container with such content, as described in any one of the relevant claims.

**[0013]** The invention therefore provides a disposable container, with a content comprising a composition for polyurethane foam which comprises free methylene diphenyl diisocyanate (MDI), and of which the valve is optionally protected by a protective cap which is removably attached to the container, characterized in that at least one accessory object, which is of potential interest to the user of the container and which may be packaged, is removably attached by itself or by means of its packaging to the container or to its protective cap.

**[0014]** The container according to the present invention offers the advantage that an accessory object which is of potential interest to the user is offered in one offering along with the container. This object may be an information carrier containing more information than what fits on the outer surfaces of the container or those of its associated protective cap. This information may for instance include information useful to the user, such as safety information related to the proper use of the container or its contents, and this optionally in one or more languages different from the language or languages in which that same information may already be mentioned on the outside of container or protective cap. The object may be for example one or preferably a pair of gloves, suitable for protecting one or accordingly both hands of the user from harmful effects of the contents of the container in case of contact with his hands, where appropriate against the effects of MDI monomer.

**[0015]** The invention further provides a protective cap

for shielding the valve of a container, the contents of which includes a compound for polyurethane foam comprising free methylene diphenyl diisocyanate (MDI), wherein an at least partially enclosed space is provided for at least one accessory object which is of potential interest to the user of the container and which may or may not be packaged.

**[0016]** The protective cap of the present invention offers the same advantages mentioned for the container according to the present invention, and this protective cap may be provided in one kit together with a container having a content identical to the container according to the present invention.

## SHORT DESCRIPTION OF THE DRAWINGS

### [0017]

Figures 1, 2 and 3 together describe a specific and preferred embodiment of a protective cap according to the present invention, including a closable compartment for a pair of protective gloves. Figure 1 shows a top view of the protective cap when closed. Figure 2 shows a cross section through the central axis of symmetry, with the compartment in open condition. The protective cap is designed in such a way so as to allow multiple protective caps to be stacked onto each other in a space saving manner, as shown in Figure 3.

Figures 4 and 5 together describe, as an alternative embodiment, a bottom cover which may be snapped onto the bottom flange of a container for PU foam, and as such closes off a compartment in which a pair of protective gloves may be stored. Figure 4 shows the bottom view and Figure 5 shows a cross section through the central axis of symmetry.

Figures 6, 7, 8 and 9 together describe another specific and preferred embodiment of a protective cap according to the present invention, with a clip for the visible storage of a pair of protective gloves. Figure 6 shows a top view of the protective cap. Figure 7 shows a cross section through the central axis of symmetry along the line VII-VII' shown in Figure 6. Figure 8 shows the bottom view and Figure 9 shows a perspective view of the same protective cap.

Figures 10, 11, 12 and 13 show an alternative and also preferred embodiment of a bottom cover which may be snapped onto the bottom flange of a container for PU foam and in which, due to integrated clips, a package containing a pair of protective gloves may be visibly stored. Figure 10 shows the top view. Figure 11 shows a cross section through the central axis of symmetry in section XI-XI' in Figure 10. Figure 12 shows a bottom view, and Figure 13 shows a perspective view of the same bottom

cover.

## DETAILED DESCRIPTION OF THE INVENTION

**[0018]** A removable attachment in this context means that the accessory object or its packaging is attached in reasonably sustainable manner such that it cannot readily be inadvertently separated from the object to which the accessory object is attached during storage, handling throughout the supply chain and at the sale. It also means that the accessory object itself may be recovered separately and in full integrity after it has been removed from the object to which the accessory object was attached.

**[0019]** In one embodiment of the present invention, the attachment is performed such that the user may sensory perceive, and preferably also recognize, whether the at least one accessory object is or is not still present at its intended location, preferably visible to the eye or palpable with the fingers. This offers the advantage that both the buyer and the seller may easily determine at the moment of purchase whether the container is complete, and/or still meets any possible legal requirements.

**[0020]** In one embodiment, the attachment is such that it may also be sensory perceived, and preferably also recognized, which purpose the accessory object is to serve. Preferably use is made of letters or logos which by themselves provide sufficient information and are sufficiently clear to evoke with the majority of the target group of users the correct association. Thus it is recommended to incorporate, along with the addition of a glove, a hand logo or a glove logo in the method of attachment, so that everyone immediately understands that close to the logo something accessory in connection with hands or hand protection is presented.

**[0021]** In another embodiment of the present invention, the at least one accessory object is selected from the list comprising of a toy, an information carrier, and one or more gloves. Preferably, the object comprises one or preferably a pair of gloves suitable for protecting one or if necessary both hands of the user of the container against contact with the MDI-containing contents of the container, and is/are optionally folded and/or either alone or jointly packaged.

**[0022]** The accessory object may target a plurality of objectives. An important objective may be to alert the user of the PU foam to the dangers of contact of the still reacting foam with the skin. Another goal could be to provide a protection for the user to protect at least one of his hands, preferably both hands against any contact with the PU foam, especially when this has not yet fully reacted.

**[0023]** In yet another embodiment of the present invention, the at least one accessory object is either glued to the container by means of its packaging or to the protective cap thereof, preferably at the base of the container, more preferably into a cavity present in the base, enclosed into a space which is shaped partly by a wall of the container or its protective cap, preferably the base of

the container or the top surface of the protective cap, in cooperation with a closing element.

**[0024]** The glued embodiment is very suitable for attaching an object which is packaged in a disposable packaging to the container or to the protective cap thereof. At its removal, the disposable packaging may possibly be ripped, but the object remains intactly available to the user. This embodiment is therefore ideal for attaching one or more MDI-resistant protective gloves, packaged in a plastic foil or other suitable material to a disposable container containing a compound for PU-foam, or the protective cap thereof.

**[0025]** This embodiment allows the accessory object to remain with the container during the handling operations which the container typically goes through until the time of sale to the user. It increases the likelihood that the container will still be intact at the time of sale, so that any statutory provisions are still met and the user may enjoy the full benefit of the container including the accessory object.

**[0026]** This glued embodiment also offers the advantage that it can be produced without any change to the entire process from filling the container to the marketing of the final product to the consumer. This entire process may be maintained, at the filling of the container no additional steps are required, the conventional components for the assembly of the consumer product do not change, and also the already existing packages may be maintained. This embodiment offers the possibility to glue the accessory object before the filling, if desired to the container or preferably to the protective cap, more preferably in such a position that the presence of the accessory object does not interfere with the filling. The inventors prefer to glue the accessory object on the inside of the protective cap. Most preferably, the accessory object is a pair of plastic gloves, which are folded in a small manner and packaged in a small tearable plastic packaging, so small and light that they do not affect the existing operations during filling and further processing and marketing down to the consumers.

**[0027]** In one variation on this embodiment with a closed space, the closing element of the space wherein the accessory object is enclosed, is glued to the wall of the container or its protective cap. This offers the advantage that if the closing element is removed, it cannot be replaced back into its former position without glue. In a particular embodiment, the closing element is made so that it loses its integrity when removed. A suitable example would be to close off the space with an easily tearable foil, e.g. aluminum foil or paper, which has to be broken as a seal to remove the accessory object from the space. The absence or presence of the closing element thus becomes a readily recognizable sign whether the accessory object is still in place, or has possibly already been removed. This may be important at the moment of purchase for the user, but also during the marketing through the distribution chain down to the user for the agents, especially if any legal provision applies which would im-

pose a requirement to deliver a specific accessory object with the container.

**[0028]** In another variation of this embodiment with a closed space, the closing element of the space wherein the accessory object is enclosed forms a moving part of the protective cap and by its movement may open and close the space which is intended for the at least one accessory object. This in turn provides the advantage that the object may be replaced by the user, for example if the container has not been completely emptied, so that the accessory object is easy to retrieve and remains available for a later use of the container.

**[0029]** In a variation of this embodiment with a closed space, the space meant for at least one accessory object is provided in the protective cap, and thereby the protective cap is shaped such that a plurality of identical specimen of the protective cap may fit together in a space saving manner. This offers the advantage that the protective caps, including the accessory object, may be manufactured separately and may be transported in a space saving manner to where the containers are equipped with their protective caps.

**[0030]** In one embodiment, the present invention relates to a protective cap shaped such that a plurality of identical protective caps fit together in a space saving manner. This has the advantage of enabling space saving transport of the protective caps to the place of assembly with the container.

**[0031]** In one embodiment, the protective cap has a conical shape, preferably shaped as a cone or pyramid which may be truncated or not, more preferably as a truncated cone or pyramid, and wherein the base of the cone or the pyramid may removably be attached to the container. The ways in which a protective cap may be removably attached to a container are well known in the art.

**[0032]** In one of these embodiments of the present invention, the protective cap has the shape of a truncated cone or pyramid, and the space for the at least one accessory object is provided in the top surface of the truncated cone or pyramid. This makes the space readily accessible, in case the room may be opened and re-closed, or makes it easy to recognize whether any seal is still intact or the accessory object is still present.

**[0033]** In a particular embodiment, the space for the at least one accessory object is sealed with a seal, the integrity or the breaking of which is recognizable for the user of the container, preferably visible to the eye or palpable with the fingers. This offers the advantage that it may be quickly noticed whether the entire entity of container, any protective cap, and accessory object are still intact and if so, whether it still meets any legal provision.

**[0034]** The present invention is further illustrated in detail by the following examples and specific embodiments, in conjunction with the accompanying drawings, without wanting to mean that the invention is limited to those detailed descriptions.

**[0035]** Figure 1 shows a top view of a preferred embodiment of a round protective cap of the present inven-

tion, suitable for the canister meant for the do-it-yourself market. Centrally located on it is a substantially circular cover 2 which is movably integrated with the protective cap 1 by means of a film hinge joint 3.

**[0036]** Figure 2 shows a cross section of a round protective cap 1 along the line AA' in Figure 1, through the symmetry axis of the protective cap. In Figure 2, the cover 2 is unfolded around the film hinge joint 3, and there is a cavity 4 made accessible to store or take out an accessory object. Cover 2 is provided with a closure 7 to hold the cover in the closed position in place, and a lip 8 which should make it easy to open the cover with a sharp point like a fingernail. The protective cap 1 is provided with a bottom edge 5 which fits onto a (not shown) top flange of a disposable canister to protect the head thereof and the valve against undesirable contact. The body of the protective cap is for the most part 6 conical, which allows the protective caps to be stacked in a space saving manner, as shown in Figure 3.

**[0037]** Figure 4 and Figure 5 show an alternative embodiment of a cover 10, which thanks to its appropriate upper rim 11 fits as a closing element according to the present invention onto the (not shown) bottom flange of a disposable canister, and seals off with the typical but not necessarily concave bottom of the canister a small space in which an accessory object may be stored.

**[0038]** Figures 6, 7, 8 and 9 together describe another specific and preferred embodiment of a protective cap 20 according to the present invention, with a clamp 21 for visible storage of a pair of protective gloves. Figure 6 shows a top view of the protective cap. Figure 7 shows a cross section through the central axis of symmetry along the line VII-VII' shown in Figure 6. This also shows how the bottom rim is provided with a means 22 suitable for snapping onto the upper flange of the container. Figure 8 shows the bottom view and

**[0039]** Figure 9 shows a perspective view of the same protective cap. Also shown on these figures is the lip 23 with a hole 24. The lip may make it easier to separate the protective cap from the container, but serves at the same time, through hole 24, as a possibility to co-supply the applicator tube, which is appropriate for the somewhat controlled application of container contents, for example by hanging it in the cavity 24 of lip 23.

**[0040]** Figures 10, 11, 12 and 13 show an alternative and also preferred embodiment of a cover 30 which may be snapped onto the bottom flange of a container for PU foam and in which, thanks to an integrated clips 31, a package comprising a pair of protective gloves may be stored in a visible manner. Figure 10 shows the top view. Figure 11 shows a cross section through the central axis of symmetry in section XI-XI' in Figure 10. This also shows how the bottom rim 32 is provided with a means which is suitable for snapping onto the bottom flange of the container. Figure 12 shows a bottom view and Figure 13 shows a perspective view of the same cover.

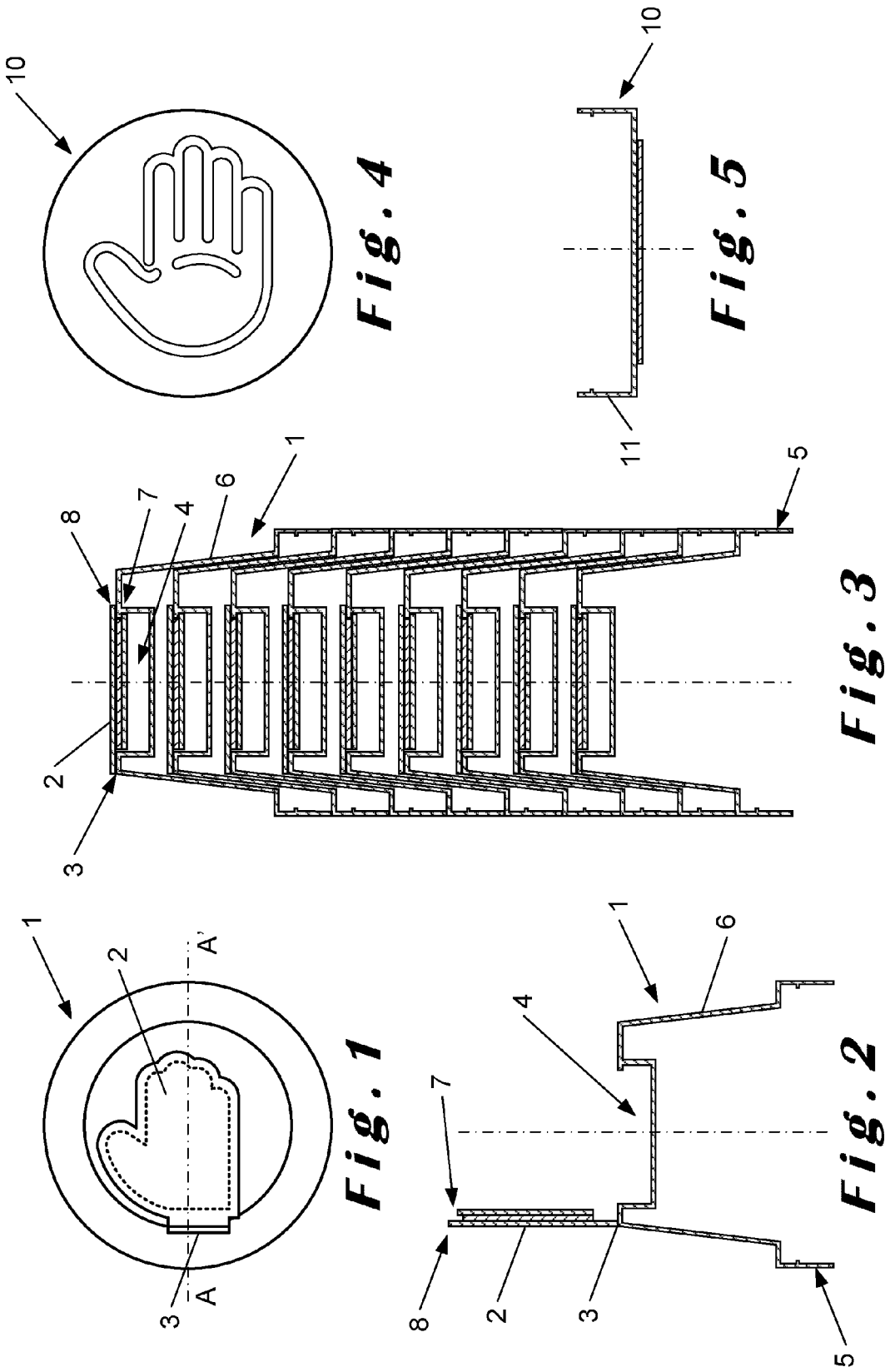
**[0041]** These embodiments are intended to contain up to a pair of protective gloves, and the visible outer edges

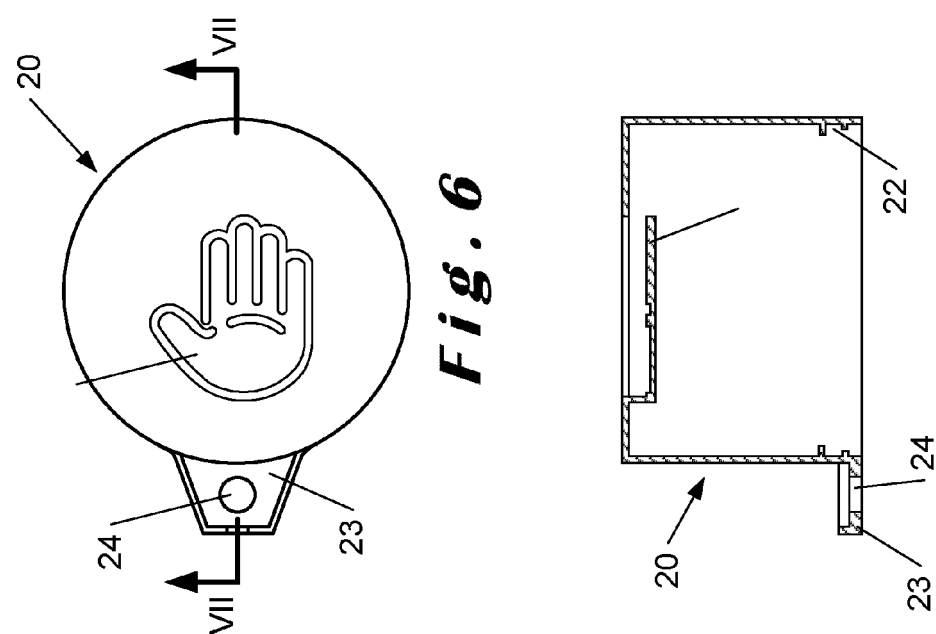
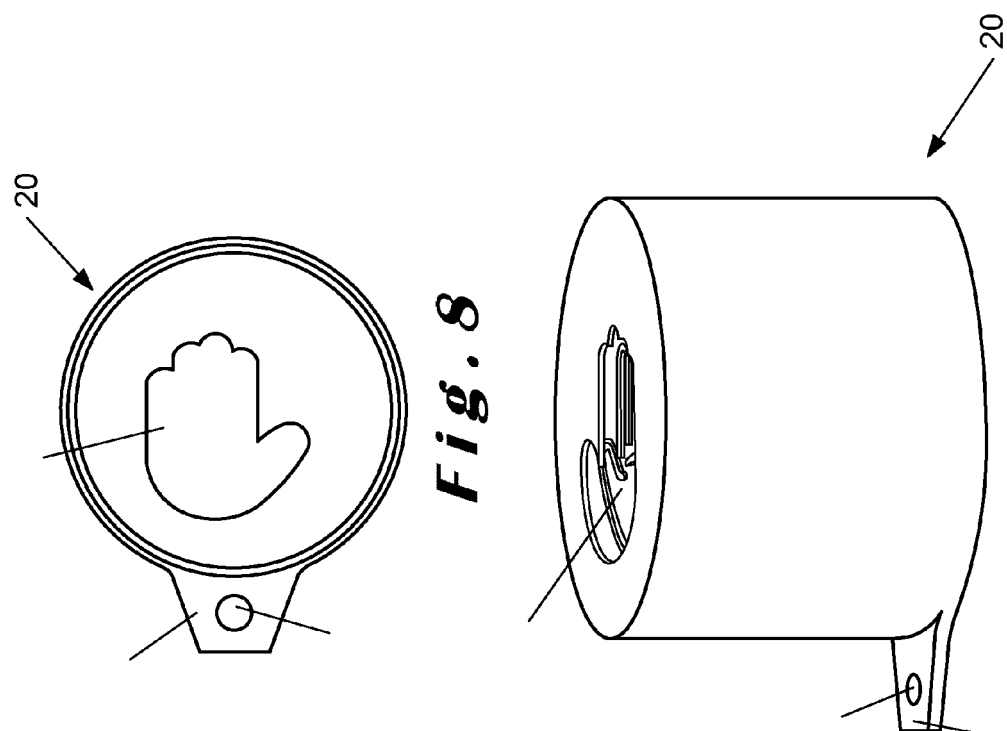
are fitted with a logo which indicates this appropriately, as shown respectively in Figures 1, 4, 6 and 10.

**[0042]** Now that the invention is fully described above, it will be understood by the skilled person that the invention may be implemented within a wide range of parameters within what is described in the following claims, without thereby departing from the spirit and scope of the invention. The skilled person will understand that the invention in general, as it is defined in the claims, also comprises other embodiments which are not specifically shown in this document.

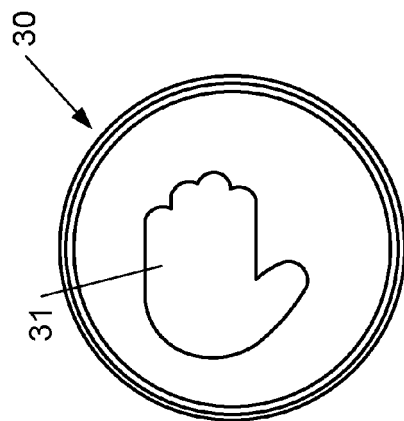
## Claims

1. A disposable container, containing a composition for polyurethane foam which comprises free methylene diphenyl diisocyanate (MDI), and of which the valve is optionally protected by a protective cap (1, 20) which is removably attached to the container, **characterised in that** at least one accessory object, which is of potential interest to the user of the container and which may be packaged, is removably attached by itself or by means of its packaging to the container or to its protective cap.
2. The container according to claim 1 wherein the attachment is provided such that the user may sensory perceive, preferably recognize, whether the at least one accessory object is or is not present in its intended location, preferably visible to the eye or palpable with the fingers.
3. The container according to any one of claims 1 or 2, wherein the at least one accessory object is chosen from the group comprising a toy, an information carrier, or one or more gloves, and comprises preferably one or more gloves, suitable for protecting one or if necessary both hands of the user of the container against contact with the MDI-containing content of the container, and which is/are optionally folded and/or packaged individually or together.
4. The container according to any one of the preceding claims, wherein the at least one accessory object, or by means of its packaging, is glued to the container or to the protecting cap thereof, preferably at the base of the container, more preferably in a cavity present in this base or is enclosed in a space, shaped partly by a wall of the container or of its protective cap, preferably the base of the container or the top surface of the protective cap, in conjunction with a closing element (2, 10, 30).
5. The container according to claim 4 wherein the closing element is glued to the wall of the container or to the protective cap thereof.
6. The container according to claim 4 wherein the closing element (2) forms a moving part of the protective cap (1) and by its movement may open and close the space (4) which is intended for the at least one accessory object.
7. The container according to any one of the claims 4 to 6 wherein the space intended for the at least one accessory object is provided in the protective cap (1), and wherein the protective cap is shaped in such a way that a plurality of identical specimen fit into each other in a space saving manner.
8. A protective cap (1, 20) suitable for protecting the valve of a container with a content according to claim 1, wherein an at least partially closed space (4) is provided for the at least one accessory object according to claim 1 or 3.
9. The protective cap according to claim 8 shaped in such a way that a plurality of identical specimen fit together in a space saving manner.
10. The protective cap according to claim 9 having a conical shape (6), preferably shaped as a cone or pyramid which may be truncated or not, more preferably as a truncated cone or pyramid, and wherein the base of the cone or the pyramid may be removably attached to the container.
11. The protective cap according to claim 10 in the shape of a truncated cone (6) or pyramid wherein the shape (4) for the at least one accessory object is provided in the upper surface of the truncated cone or pyramid.
12. The protective cap according to claim 10 wherein the space for the at least one accessory object is sealed with a seal, the integrity or the breaking of which is recognizable for the user of the container, preferably visible to the eye or palpable with the fingers.

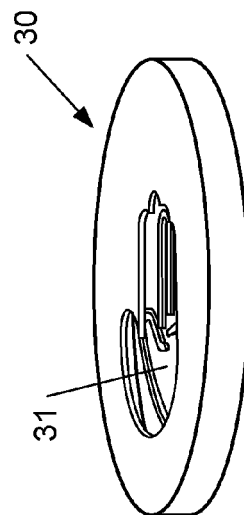




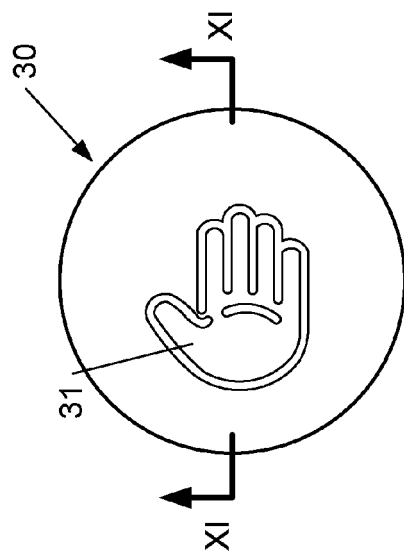




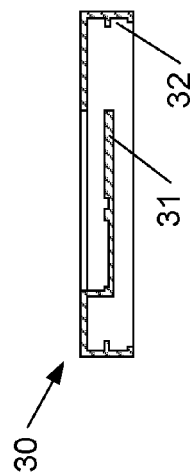
**Fig. 12**



**Fig. 13**



**Fig. 10**



**Fig. 11**



## EUROPEAN SEARCH REPORT

Application Number  
EP 11 16 0288

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 July 2011	Examiner Ngo Si Xuyen, G
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 16 0288

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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