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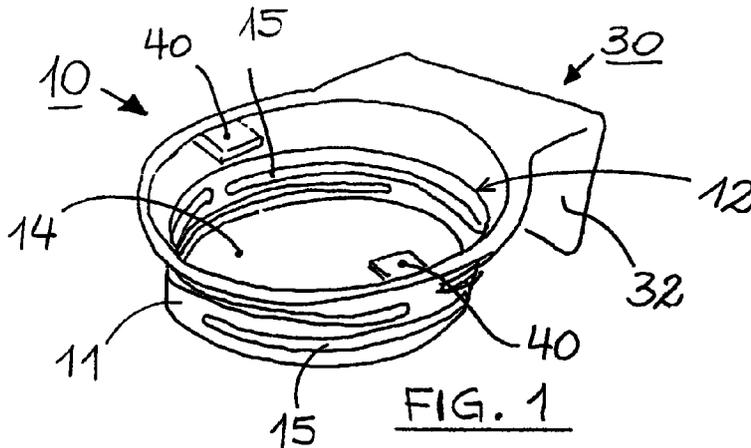
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**(54) Dispensing device for tablets**

(57) The present invention relates to a tablet dispensing device (10). The tablet dispensing device comprises tablet restraining means (11) and a filling opening (12). The tablet restraining means (11) is liquid permeable so that a liquid passing through the tablet restraining means (11) and/or the filling opening (12) dispenses the

detergent tablet when the dispensing device (10) retains a detergent tablet. The tablet restraining means (11) is a flexible and resilient spring (14) which expands when a tablet is inserted into the dispensing device (10).



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## Description

### Field of the invention

The present invention relates to a dispensing device for detergent in tablet form.

### Background of the invention

Detergent compositions formed in non particulate solids such as bars or tablets or briquettes are known in the art. In the following, the term "tablet" will refer to any form of non particulate solids. The tablet provides a number of advantages to both the consumer and the manufacturer. Indeed, the tablet prevents spillage of the detergent composition. Furthermore, the tablet eliminates the need for the user to estimate the dosage of detergent composition required and ensures that the correct dosage of detergent composition per wash cycle is used by the user.

To further simplify handling and in order to maximise dissolution, thus performance of the detergent tablet, many detergent compositions manufacturers provide the consumer with dispensing devices in which to place the detergent tablet prior to being placed in the washing machine. Indeed, dispensing devices in the form of baskets or cradles are often utilised for example in automatic dish washing machines to maximise the performance of the tablet.

An example of a dispensing device for tablets which may be introduced in an automatic dish washing machine is described in co-pending European Patent Application No. 95304115.9. This dispensing device may comprise a fastening means which fastens the dispensing device to the interior of an automatic washing machine such that it can be released therefrom when required. In an automatic dish washing machine the dispensing device is usually attached to the exterior of the cutlery basket or the crockery basket.

Usually, these dispensing devices are made such that the size of the dispensing device is equal or bigger than the maximum amount of tablets recommended for a wash cycle. Commonly, different dosage recommendations are given for differently soiled loads. For example, the recommended dosage for a wash cycle may be only one tablet for less soiled loads, two tablets for very soiled loads. Consequently, the dispensing device has to be such to allow the insertion of at least two tablets in this case. For this reason the dispensing device has to be at least big enough to allow the maximum recommended dosage of the tablets. It has been found that this is in conflict with the tendency to reduce the volume of the packages containing the tablet together with the dispensing device.

Indeed, since the detergent composition is already dosed and compacted into tablets, smaller packages can be used for the packaging of the tableted detergent. Smaller packages means less space needed for

storage and transportation, therefore also logistic and cost improvements of the packaged detergent are achieved. However, part of the logistic and cost improvements may be lost when the dispensing device is included in the packages. Indeed, the volume occupied by the dispensing device has to be further added to the package containing the detergent tablets. Thus, part of the advantage of reducing the space for a package resulting of detergents compacted into tablets is lost when a dispensing device is included in the packages, especially when the dispensing device has to be at least as big as the recommended maximum dosage.

It is therefore an object of the present invention to provide a dispensing device occupying less amount of volume in a package, nevertheless allowing the insertion up to the maximum recommended amount of tablets.

### Summary of the invention

The present invention is a tablet dispensing device. The tablet dispensing device comprises tablet restraining means and a filling opening. The tablet restraining means is liquid permeable so that a liquid passing through the tablet restraining means and/or the filling opening dispenses the detergent tablet when the dispensing device retains a detergent tablet. The tablet restraining means is a flexible and resilient spring which automatically expands when a tablets is inserted into the dispensing device.

### Brief description of the figures

Figure 1 shows a front view of a dispensing device according to the present invention without retaining any tablet.

Figure 2 shows a front view of the dispensing device of Figure 1 filled with one tablet.

Figure 3 shows a front view of the dispensing device of Figure 1 filled with two tablets.

### Detailed description of the invention

In the following any form of non particulate solids such as bars or tablets or briquettes will be encompassed by the term "tablet". The tablet may be made by a detergent composition for dish or laundry washing. The tablet may have any shape or dimension. Preferably, the solid, non particulate tablet is symmetrical to ensure the uniform dissolution of the tablet in the wash liquor.

According to a preferred embodiment of the present invention the detergent tablet may comprise any ingredients known in the art. Such ingredients may include surfactants, suds suppressers, bleaches, chelants, builders, enzymes, fillers and perfumes.

According to a preferred embodiment of the present invention the detergent composition of the tablet is pre-

pared in its granular or particulate form and then formed into tablets of the desired shape and size by any one of the methods known in the art. Suitable methods include compression, extrusion and casting. The detergent composition may be homogeneously distributed throughout the tablet or may comprise distinct layers of certain detergent ingredients.

The present invention provides a tablet dispensing device (10). The tablet dispensing device comprises tablet restraining means (11) and a filling opening (12). The filling opening allows the insertion of at least a detergent tablet into the dispensing device. Consequently, the size of the filling opening corresponds to the size of the detergent tablet. Also the form of the filling opening corresponds to the shape of the tablet.

The tablet restraining means (11) holds the tablet in the dispensing device. Consequently, a tablet inserted into the dispensing device is not able to escape from dispensing device. The tablet restraining means is liquid permeable so that a liquid passing through the restraining means and/or the filling opening dispenses the detergent tablet when the dispensing device retains a detergent tablet. In this manner the liquid can pass not only through the filling opening to dispense the detergent tablet, but also through the restraining means. This improves the dispensing of the detergent tablet from within the dispensing device. Therefore a detergent tablet contained in the device can be dissolved during a wash cycle, for example, by water. The dissolved detergent tablet forms a wash liquor. This wash liquor is able then to exit the dispensing device to be available in the wash cycle of an automatic dish or laundry washing machine.

Preferably, the tablet restraining means comprise orifices or slits (15) to make the tablet restraining means liquid permeable. The orifices or slits are such to allow a liquid to pass through the restraining means. This enables the tablet to be dissolved more efficiently. This means that water is able to enter into the dispensing device and reach the tablet inside. The orifices are preferably evenly distributed throughout the tablet restraining means. The orifices are such that the tablet cannot be removed from the dispensing device through the orifices. Nevertheless, the orifices are such to allow water to enter the dispensing device for dissolving the detergent tablet during the wash cycle of the automatic dish or laundry washing machine.

The tablet restraining means (11) is a flexible and resilient spring (14). The flexible and resilient spring (14) automatically expands when a tablets is inserted into the dispensing device. By expanding the tablet restraining means, the volume available in the dispensing device is increased. Consequently, one or more tablets can be inserted into the dispensing device according to the present invention whereby the size of the tablet restraining means adapt automatically to the number of tablets inserted. Preferably, the weight of the tablets is already sufficient to achieve that the tablet

restraining means expands automatically giving space to the inserted tablet. Preferably, the spring comprises an interrupted wall opposite the filling opening (12). The wall being interrupted ensures liquid permeability of the interrupted wall. The interrupted wall is such that the tablet cannot be removed from the dispensing device through the apertures of the interrupted wall.

The dispensing device having a flexible spring allows the dispensing device to be stored to a minimum volume. Hereinafter, "minimum volume" is the volume of the dispensing device when no detergent tablet is inserted into the dispensing device. This means that the dispensing device can be stored in a package without substantially increasing the available space in a package. Consequently, the size of the package can also be kept to a minimum. Preferably, dispensing device in its minimum volume is such that the available volume of the dispensing device is not sufficient to retain a detergent tablet.

The tablet restraining means (11) being also resilient allows the dispensing device (10) to return to the configuration of minimal volume after the tablet(s) have been dispensed. Preferably, the flexible and resilient spring (14) is shown in Figure 1. When one or more detergent tablets are inserted into the dispensing device, the spring unfolds making enough space for retaining the inserted tablet(s), as shown in Figures 2 and 3. Once the tablet is dispensed, the spring may preferably automatically return to the configuration of minimum volume of Figure 1. This spring is preferably made of elastomeric materials, such as polypropylene, polyethylene or polyester, or of metal, such as stainless steel or aluminium. The spring made of metal material may also be protected by a layer of plastic on the outside of the spring. All these materials ensure enough compatibility with the wash solution and resistance to the temperatures usually encountered in an automatic dish or laundry washing machines.

As another optional feature of the present invention, the dispensing device comprises fastening means (30). As used herein, fastening means refer to any means which can be adapted to fasten the dispensing device to the interior of e.g. an automatic dish washing machine such that it can be released therefrom when required by the user. The fastening means is preferably made of similar or identical material to that of the dispensing device itself. The fastening means may preferably be located on the tablet restraining means (11). The fastening means preferably comprises at least a hook (32), which extends from the tablet restraining means. Preferably, the fastening means is adapted to be fastened on the exterior or interior of the cutlery basket of an automatic dish washing machine.

Preferably, the dispensing device is further provided with securing means. As used herein, securing means refers to any means which can be adapted to secure the dispensing device to the interior of an automatic dish or laundry washing machine such that it cannot be disen-

gaged therefrom during the wash cycle of the automatic washing machine. Specifically, the securing means is adapted to prevent disengagement of the dispensing device due to forces occurring inside an automatic dish washing machine, as for example forces exerted by the circulation of water and/or air. Nevertheless, the securing means does not impede the release of the dispensing device from the interior of an automatic dish or laundry washing machine when required by the user. Preferably, the securing means is adapted to secure the dispensing device on the cutlery basket of an automatic dish washing machine. The securing means is preferably made of similar or identical material as the dispensing device, but being more flexible with respect to the dispensing device itself. Other flexible material, like metals, may be also considered for the purpose of the present invention.

The co-pending International Patent Application No. PCT/US95/12787 provides a dispensing device with securing means as defined before. The securing means prevents the dispensing device (10) from disengaging from the cutlery basket. Specifically, the securing means prevents disengagement of the dispensing device in a direction which is opposite to the direction in which the dispensing device is fastened with the fastening means. All the embodiments described as securing means in the International Patent Application No. PCT/US95/12787 are herewith incorporated by reference.

As a preferred option, the dispensing device (10) further comprises a child resistant restraining means (Fig. 1, 40). The restraining means is adapted to prevent the removal of the tablet through the filling opening (12) prior to the dissolution of the tablet in the wash liquor. In particular, as used herein, the wording child resistant restraining means refers to any mechanism whereby access to the tablet, once inserted in the dispenser, is reduced so that the tablet cannot be readily removed, especially by infants and children.

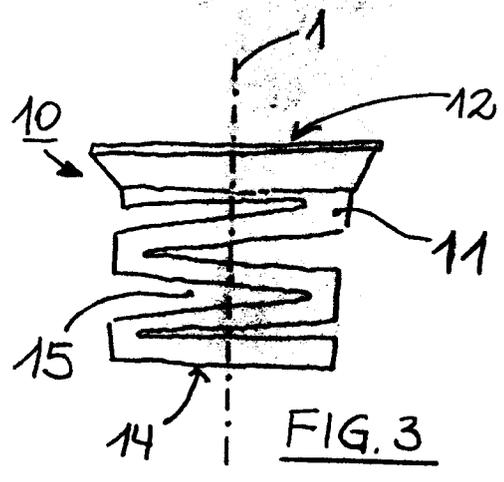
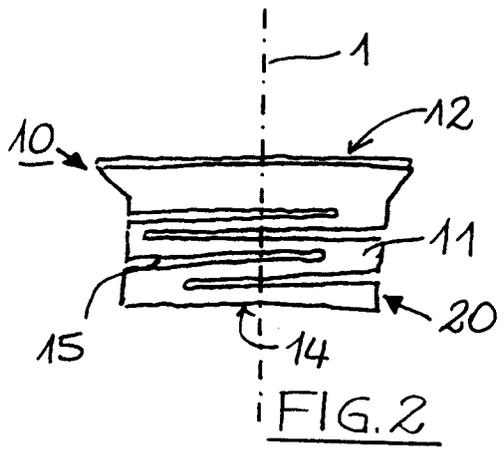
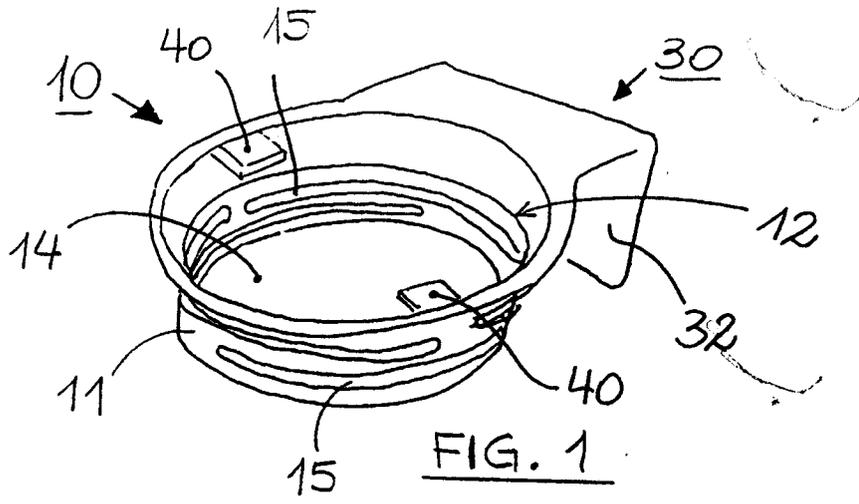
A possible child resistant restraining means (40) may be at least a resiliently hingeable or deformable element located in the region of the filling opening (12). The resiliently hingeable or deformable element is displaced from its rest position within the interior of the dispensing device (10) by the insertion of the tablet. The element has minimal, preferably no opposite hingeable motion or deformability beyond its rest position, so that the tablet cannot be removed from the hollow body once inserted therein. According to the present invention the resiliently hingeable or deformable element may entirely close or partially close the opening of the dispensing device. Any number and any positioning with any configuration of the resiliently hingeable or deformable elements around the opening may be variably chosen.

The dispensing device of the present invention may be formed from any flexible, water resistant material that can withstand moderately elevated temperatures, such as those reached in automatic washing machines, e.g.

about 95° C, for a relatively long period of time (about 3 hours) and which can be formed into the desired shape. Preferably the dispensing device is made of low cost thermoplastic material such as polypropylene or polyethylene and formed by injection moulding.

### Claims

1. A tablet dispensing device (10) comprising tablet restraining means (11) and a filling opening (12), the tablet restraining means (11) being liquid permeable so that a liquid passing through the tablet restraining means (11) and/or the filling opening (12) dispenses the detergent tablet when the dispensing device (10) retains a detergent tablet, characterized in that the tablet restraining means (11) is a flexible and resilient spring (14) which expands when a tablet is inserted into the dispensing device (10).
2. A tablet dispensing device according to claim 1 characterized in that the spring (14) automatically expands when a tablet is inserted into the dispensing device.
3. A tablet dispensing device according to either of the preceding claims characterized in that the tablet restraining means comprises slits or orifices (15).
4. A dispensing device according to any of the preceding claims characterized in that the flexible and resilient spring comprises an interrupted wall.
5. A dispensing device according to any of the preceding claims characterized in that the dispensing device comprises fastening means (30).
6. A dispensing device according to any of the preceding claims characterized in that the dispensing device comprises securing means.
7. A dispensing device according to any of the preceding claims characterized in that the dispensing device comprises child resistant restraining means (40).





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EUROPEAN SEARCH REPORT

Application Number  
EP 96 30 9515

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A,D	EP 0 691 102 A (THE PROCTER & GAMBLE COMPANY) * claims; figures * ---	1	A47L15/44
A	EP 0 576 234 A (UNILEVER PLC) * claims; figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47L D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28 May 1997	Examiner Courier, G
<p><b>CATEGORY OF CITED DOCUMENTS</b></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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