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(54) A frictioned mechanism holder for paste products in a stick-form

(57) In a frictioned-mechanism holder for lipsticks, an annular element (11) is provided which has an undulated circumferential extension and is interposed, in a condition of axial precompression, between first and second abutment shoulders (12, 13) formed on a bottom portion (3) of an inner tubular body (2) and a terminal edge (4a) of an outer tubular body (4) respectively, the outer tubular body being coaxially fitted on the inner tubular body (2).

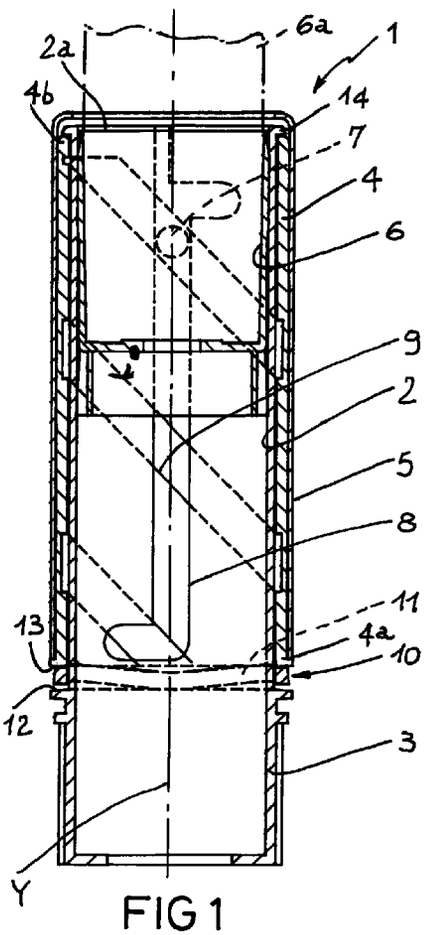

FIG 1

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Description

The present invention relates to a frictioned-mechanism holder for paste products in a stick farm, of the type comprising: an outer tubular body; an inner tubular body coaxially and rotatably engaged in the outer tubular body; a cup axially slidable in the inner tubular body and arranged to hold a paste product in a stick form; interconnecting means operatively disposed on the cup, the inner tubular body and the outer tubular body to cause an axial translation of the cup as a result of a relative rotation between said tubular bodies; mechanical-friction spring means acting in an axial thrust relationship between the inner and outer tubular bodies to generate a controlled friction when a relative rotation between said bodies takes place.

The holder in accordance with the invention is particularly conceived for containing lipsticks, and in the progress of the present description reference will be particularly made to these products. However, the use of the holder in reference for containing other types of paste products in a stick form is not to be excluded, which products may be of medical and cosmetic use for example, and/or involve personal hygiene products to be applied to the skin.

It is known that lipsticks and the like in a stick form are usually contained in appropriate holders provided with a mechanism enabling elevation of the lipstick and reintroduction of the same into the holder. In more detail, holders of this type are essentially comprised of an outer tubular body coaxially and rotatably fitted on an inner tubular body along which a cup holding the lipstick or the like is slidably guided.

Interconnecting means is operatively associated with the cup and the outer and inner tubular bodies in such a manner that, as a result of a relative rotation between the tubular bodies, the cup is submitted to an axial translation causing the lipstick to be elevated from or lowered into the holder.

Currently, interposed between the inner and outer tubular bodies is a high-viscosity lubricant having a dual function, i.e. compensating for the unavoidable coupling plays between the bodies resulting from working tolerances, and providing an appropriate resistance to the relative rotational movement of the tubular bodies so that, on operation, the user is given a feeling of smooth and progressive swivelling. However, it has been found that the above lubricating oils, by coming into contact with the lipstick, tend to cause partial melting of the latter and/or to get stained by the lipstick pigments, so that the user has the impression that the lipstick has partly melted and soiled the holder's inner surfaces.

In order to eliminate the use of lubricating oils, different mechanical-friction systems between the tubular elements of the holder have been recently studied.

For example, European Patent EP 0 439 381 discloses a lipstick holder provided with an annular element fixed by fitting on a bottom portion of the inner tubular body and provided with a plurality of circumferentially distributed spring fins projecting from one edge of the ring, in a direction substantially parallel to the geometrical axis thereof. When the annular element is fitted onto the bottom portion of the inner tubular body, the fins are interposed between the inner tubular body and the outer tubular body thereby acting in radial spring thrust relationship with a cylindrical abutment surface internally formed in the outer tubular body itself. Under this situation, the tubular element lends itself to be driven in rotation integrally with the inner tubular body, so that the spring fins exert the desired frictional force, by their rubbing against the above mentioned cylindrical abutment surface.

The above described solution however involves an important increase in the lipstick holder costs. In fact, the annular element provided with spring fins is a piece of a rather complicated geometrical configuration. Then production costs are further increased by the necessity to arrange appropriate fitting means between the finned annular element and the bottom portion of the inner tubular element. A certain increase in the production costs is also due to the fact that the geometrical configuration of the inner and outer tubular bodies needs to be greatly modified in comparison to the more traditional solutions, so as to arrange the fitting means for the finned tubular element on the former and the cylindrical abutment surface on the latter.

It is also to point out that the degree of elastic deformation to be imparted to the fins during the assembling step must be necessarily limited in order to be able to give sufficient quaranties of a correct fitting of the fins into the end portion of the outer tubular body. On the other hand, mounting of the finned annular element must be carried out with some care and accuracy to avoid damaging the fins in case of imperfect centering of the ring with respect to the end portion of the outer tubular body.

In addition, this embodiment does not carry out any compensation for axial plays between the outer and inner tubular bodies, in that the action of the elastic fins is only able to compensate for plays in a radial direction.

Another known solution for achieving a mechanical frictional effect between the outer and inner tubular bodies essentially consists in providing elastic fins directly in the inner tubular body by appropriate cuts formed therein directly during the moulding step. Formed on the spring portions confined by the cuts are, during the moulding step as well, friction projections radially jutting out of the inner tubular body. When the inner tubular body is fitted into the outer tubular body, the friction projections interfere with the inner cylindrical surface of the outer tubular body, elastically preloading the fins. Under this situation the friction projections elastically act on the inner cylindrical surface, so as to create the required friction force for rotation between the inner and outer tubular bodies.

While obtaining of the spring portions directly in the outer tubular body represents a considerable construction simplification, it has been found that the obtained

frictional action is not completely satisfactory. This drawback can be ascribed at least partly to the fact that the spring portions must be made of the same material forming the inner tubular body, the elasticity features of which are of secondary importance with respect to other features, such as mouldability of the material for example.

It is also to note that the available spaces on the inner tubular body surface enable only a small number of fins to be obtained and, as a result, the friction mechanism is made sensitive to possible oval deformations of the tubular bodies causing discontinuity in the resistance to relative swivelling of these two parts.

In addition, this solution too does not enable any compensation for axial plays between the tubular bodies.

European Patent EP 0 207 114 discloses a lipstick holder in which the friction mechanism comprises a pair of flexibile fins, each fin being accomplished by two circumferential cuts arranged close to the bottom portion of the inner tubular body. Each flexible portion carries a friction pin projecting radially outwardly and arranged to elastically act in axial thrust relationship against an end edge of the outer tubular body.

This solution too, however, has a drawback in that the spring portions are directly formed in the inner tubular body and therefore made of the same material as said body. Therefore, achievement of a satisfactory spring action by the friction pins appears to be difficult, also due to the fact that, under the effort transmitted by said pins, the spring portions are prevailingly submitted to torsional and shearing stresses at their attachment ends to the inner tubular body. Due to the above anomalous stresses, the spring portions can also be undesirably subjected to yielding and/or breaking.

In accordance with the present invention, it has been found that all limits of the known art can be brilliantly overcome by an annular element that can be elastically deformed in the axial direction and is operatively interposed between abutment shoulders carried by the inner tubular body and outer tubular body, respectively.

More particularly, it is an object of the present invention to provide a frictioned-mechanism holder for paste products in a stick form, characterized in that said controlled-friction spring means comprises: a first circumferential abutment shoulder carried by the inner tubular body; a second circumferential abutment shoulder carried by the outer tubular body; an annular spring element operatively interposed in axial precompression relationship between the first and second abutment shoulders.

Further features and advantages will become more apparent from the detailed description of a preferred and non-exclusive embodiment of a frictioned-mechanism holder for paste products in a stick form, in accordance with the present invention. This description is taken hereinafter with reference to the accompanying drawings, given by way of example only and therefore not in a limiting sense, in which:

- Fig. 1 is a diametrical sectional view of a frictioned-mechanism holder for paste products in a stick form, in accordance with the present invention;
- Fig. 2 is a fragmentary enlarged side view of the holder shown in Fig. 1;
- Fig. 3 is a top view of an annular friction element arranged in the holder in reference;
- Fig. 4 is a side view of the annular friction element shown in Fig. 3;
- Fig. 5 shows the side extension of the friction ring.

With reference to the drawings, a frictioned-mechanism holder for paste products in a stick form in accordance with the present invention has been generally identified by reference numeral 1.

Holder 1 comprises an inner tubular body 2 having a bottom end portion 3 intended for carrying a base body (not shown, as known in itself) capable of engagement with the bottom portion itself, by forced fitting for example.

Coaxially fitted on the inner tubular body 2 is an outer tubular body 4 that, in a manner known per se, can be covered with an outer surrounding sheath 5 of metal material.

Slidably guided in the inner tubular body 2 is a so-called cup 6 usually designed to engage a lipstick 6a or other paste products in a stick form. The cup 6 is connected to the inner 2 and outer 4 tubular bodies by interconnecting means, by effect of which the cup 6 is selectively elevated or retracted, that is moved apart from or close to the bottom end portion 3, as a result of relative rotations between the tubular bodies.

In a manner known per se, the interconnecting means comprises a pair of slide pins 7 radially projecting at diametrically opposite positions from the cup and slidably moving along respective guide slots 8 formed longitudinally in the inner tubular body 2 to be then inserted into at least one helical groove 9 formed in the inner cylindrical surface of the outer tubular body 4.

Holder 1 further comprises mechanical-friction spring means 10 acting in axial thrust relationship between the outer 4 and inner 2 tubular bodies to generate a controlled friction to the relative rotation between the last mentioned bodies. This mechanical-friction means 10 comprises at least one annular element 11 operatively interposed between a first circumferential abutment shoulder 12 and a second circumferential abutment shoulder 13, carried by the inner tubular body 2 and outer tubular body 4 respectively, and extending in parallel planes perpendicular to the relative-rotation geometrical axis "Y" of the tubular bodies.

The annular element 11, which also extends substantially in a plane perpendicular to axis "Y" of the tubular bodies, is capable of elastic deformation in an axial direction and is enclosed between the first and second abutment shoulders, 12 and 13 respectively, in a

condition of elastic deformation under axial compression, so as to exert a spring contrast action on the abutment shoulders 12 and 13 tending to move said shoulders apart from each other. The spring action of the annular element 11 is counteracted by an auxiliary shoulder 14 radially projecting outwardly from an upper end 2a of the inner tubular body 2 and acting against the corresponding upper end 4b of the outer tubular body 4. In more detail, the first abutment shoulder 12 is formed close to the bottom portion 3 of the inner tubular body 2, and projects radially outwardly close to said bottom portion.

In the embodiment shown, the second abutment shoulder 13 is substantially constituted by the terminal edge of a lower end 4a in the outer tubular body, in facing relationship with said bottom portion 3.

In a preferential embodiment, the annular spring element 11 is made of a plastic material and has a substantially quadrangular profile in cross-section, one side thereof being disposed in a plane perpendicular to its own geometrical axis, that is parallelly to the abutment shoulders 12, 13. Homogeneously distributed along the circumferential extension of the annular element 11 is a plurality of portions 15 capable of elastic deformation by effect of the axial stresses to which the spring element is subjected. In more detail, for this purpose the annular element 11 is provided to have an undulated circumferential extention so that each portion 15 capable of elastic deformation is defined by a lower half-wave 15a and an upper half-wave 15b consecutively alternated and projecting from opposite sides with respect to a common median plane "X" perpendicular to the geometrical axis of the annular element 11.

In a preferential solution, defined on the circumferential extension of the annular element are at least three lower half-waves 15a designed to act against the first abutment shoulder 12, alternated with three upper half-waves 15b acting against the second shoulder 13.

The thrust action exerted by portions 15 capable of elastic deformation on shoulders 12, 13 ensures complete elimination of any axial play between the inner 2 and outer 4 tubular bodies while at the same time generating an appropriate frictional resistance to the relative rotation between the tubular bodies themselves.

By virtue of the construction concept of the mechanical-friction spring means 10, the frictional resistance value can be easily controlled during the planning step, by an appropriate selection of the amplitude "h" given to undulations on the circumferential extension of the annular spring element 11, keeping into account the nominal distance "d" intervening between the abutment shoulders 12, 13. In other words, value "h" to be measured between the apices of the lower 15a and upper 15b half-waves when the annular element 11 is in a rest condition is provided to be greater than the axial distance "d" intervening between the abutment shoulders 12, 13, so that, when the annular element has been mounted, it will be submitted to some axial precompression, previously set during the planning step.

It is to point out that, due to the particular structural configuration of the annular element 11, the axial deformation of the latter results in bending stresses distributed over the whole circumferential extension thereof. These bending stresses substantially tend to flatten undulations 15, slightly increasing the diameter of the annular element 11.

Under this situation, it is to note that no substantial alteration will occur in the amount of the spring force exerted on the abutment shoulders, and therefore the frictional forces consequently generated thereon, even if, due to working tolerances, distance "d" intervening between the shoulders should greatly diverge from the nominal value. In fact, stresses generated in the annular element 11 by effect of an increase or decrease in the deformation undergone by said element with respect to the preset deformation value, are distributed over the whole circumferential extension of the annular element and therefore acquire a quite negligible importance.

In conclusion, the invention offers the greatest planning freedom in selecting the amplitude to be given to undulations in the annular spring element 11, for achieving the desired frictional resistance, without said resistance being affected by the inevitable occurrence of deviations from the nominal measurements, due to working tolerances.

In addition, since the annular spring element 11 is made separately from the other holder components, there is a complete freedom in selecting the materials to make it, which selection may in particular aim at achieving the required elasticity features.

Furthermore, the annular element 11 is completely insensitive to possible oval deformations between the inner 2 and outer 4 tubular bodies, which on the other hand can be easily compensated for by arranging an appropriate hollow space between the outer and inner cylindrical surfaces of said bodies.

Arrangement of any number of portions capable of elastic deformation on the annular element is also possible, so that sensitivity of the mechanism to possible planarity faults in the abutment shoulders can be limited.

It should be also noted that, by means of simple adaptations, the innovatory solution proposed by the present invention lends itself to be easily utilized in traditional holders, in which a frictional action and compensation for plays between the inner and outer tubular bodies has been hitherto obtained with the use of lubricants and the like.

The very simple structure and construction of the annular spring element, in addition, makes it possible to adopt the present invention without greatly increasing the production costs of the holder.

It will be also recognized that the perfect symmetry of the annular spring element 11 in a plane perpendicular to its own geometrical axis facilitates manipulation of same during the assembling step, where, above all with reference to an automated assembling, all operations

needed for suitably guiding the annular element, in order to allow fitting of same on the inner tubular body 2 before the latter is introduced into the outer tubular body 4, appear to be greatly simplified.

Claims

1. A frictioned-mechanism holder for paste products in a stick form, comprising:

   - an outer tubular body (4);
   - an inner tubular body (2) coaxially and rotatably engaged in the outer tubular body (4);
   - a cup (6) axially slidable in the inner tubular body (2) and arranged to hold a paste product (6a) in a stick form;
   - interconnecting means (7, 8, 9) operatively disposed on the cup (6), the inner tubular body (2) and the outer tubular body (4) to cause an axial translation of the cup as a result of a relative rotation between said tubular bodies (2, 4);
   - mechanical-friction spring means (10) acting in an axial thrust relationship between the inner (2) and outer (4) tubular bodies to generate a controlled friction when a relative rotation between said bodies takes place,
     characterized in that said controlled-friction spring means (10) comprises:

     - a first circumferential abutment shoulder (12) carried by the inner tubular body (2);
     - a second circumferential abutment shoulder (13) carried by the outer tubular body (4);
     - an annular spring element (11) operatively interposed in axial precompression relationship between the first and second abutment shoulders (12, 13).

2. A holder according to claim 1, wherein said annular element (11) has an undulated circumferential extension to define portions (15) capable of elastic deformation and homogeneously distributed on the circumferential extension itself.

3. A holder according to claim 2, wherein said portions (15) capable of elastic deformation are defined by consecutively alternated lower half-waves (15a) and upper half-waves (15b) projecting from opposite sides with respect to a common median plane perpendicular to the geometrical axis of the annular element (11).

4. A holder according to claim 3, wherein at least three lower half-waves (15a) alternated with three upper half-waves (15b) are provided.

5. A holder according to claim 1, characterized in that said annular element (11) has a substantially quadrangular profile in cross-section, one side thereof being disposed parallelly to the abutment shoulders (12, 13).

6. A holder according to claim 1, wherein said first abutment shoulder (12) is formed adjacent to a bottom end portion (3) of the inner tubular body (2), axially projecting with respect to a lower end (4a) of the outer tubular body (4).

7. A holder according to claim 6, wherein said second abutment shoulder (13) is formed on a terminal edge of the lower end (4a) in the outer tubular body (4).

8. A holder according to claim 1, wherein said abutment shoulders (12, 13) extend in respectively parallel planes perpendicular to the axis (Y) of relative rotation between said inner (2) and outer (4) tubular bodies.

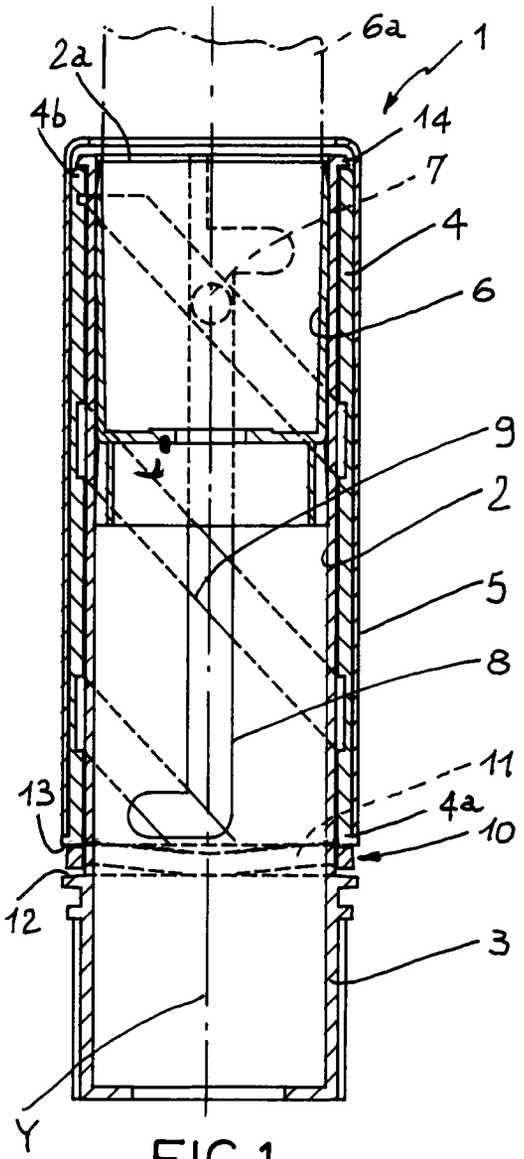

FIG 1

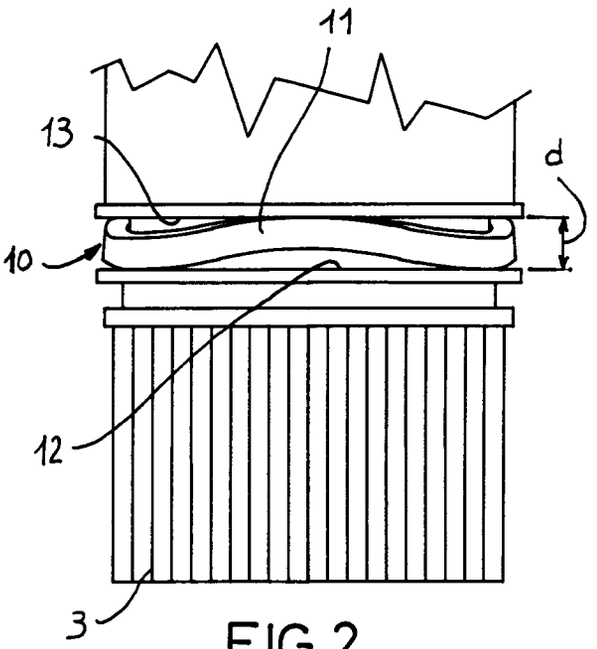

FIG 2

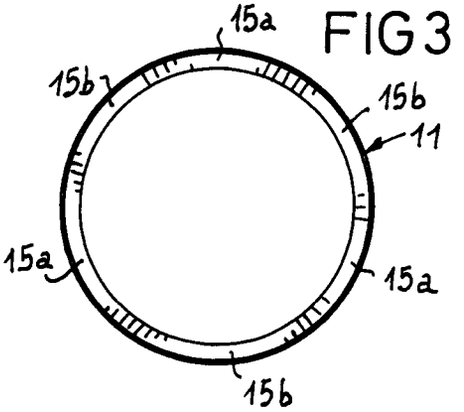

FIG 3

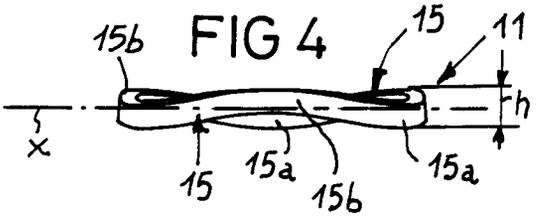

FIG 4

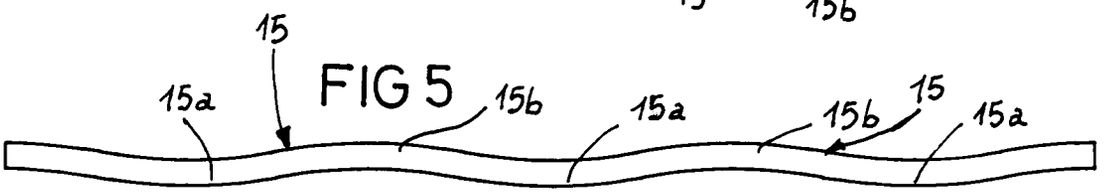

FIG 5

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EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0328

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)
X	EP-A-0 709 042 (RISDON CORP) 1 May 1996 * column 3, line 55 - column 4, line 21; figures 1-7 *	1-8	A45D40/06
D,X	EP-A-0 207 114 (OREAL) 7 January 1987	1,2,5-8	
D,X	& WO-A-86 03658 (OREAL)	1,2,5-8	
A	* page 9, line 20 - line 36; figure 7 * * page 11, line 18 - page 12, line 5; figures 13-15 * * page 12, line 24 - page 13, line 9; figure 18 *	3,4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A45D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 November 1996	Schmitt, J

CATEGORY OF CITED DOCUMENTS

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