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(54) **A dispenser of active substances for WCs**

(57) A dispenser of active substances for a WC bowl, comprising a container (2) for at least one solid or semisolid active substance (3), and means (4) for attaching the container (2) to the rim of the WC bowl, in such a way as to support the container (2) in a position where the container (2) is subjected to the flow of flush water, the container (2) comprising a wrapper (2) which is made of a flexible film, which wrapper (2) envelops and retains the solid or semisolid, or sufficiently viscous liquid active substance (3), and allows passage of inflowing water, and passage of outflowing water together with the active substance which is contained therein.

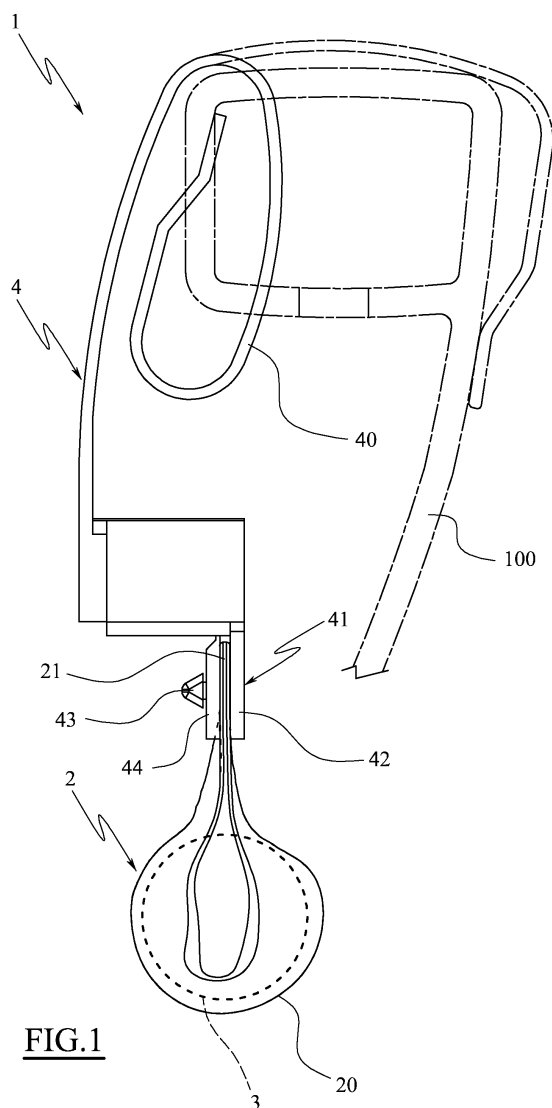


FIG.1

Description

[0001] The invention concerns a dispenser of active substances for WC bowls, of a type comprising a container for the active substance and means for attaching the container to the rim of the WC bowl, in such a way as to maintain the container suspended in a position where it is subjected to a flow of flush water.

[0002] As is known, the simpler types of WC dispenser comprise a rigid cage-like container, which contains a solid active substance in the form of a single compacted block, which is usually called a "rim-block".

[0003] The active substance dissolves when in contact with the flush water, giving rise to a liquid mixture which passes through the mesh of the cage, spreading over the inner surface of the WC bowl, where it can produce an effect that, according to the type of active substance used, may be deodorant, detergent, disinfectant or the like.

[0004] The cage for the active substance and the means for attaching to the WC bowl are usually made of plastic by an injection-moulding process.

[0005] These dispensers have a rather high production cost, due to the relatively high cost of the machines and moulds, the cost of the material, and high energy consumption. Further, because a large quantity of plastic is used, the dispensers have a significant impact on the environment and consequently a high cost of disposal (community refuse disposal charges).

[0006] An aim of the invention is to make available a dispenser for WC bowls which is cheaper to manufacture and has a smaller environmental impact than dispensers in the prior art, while leaving the way the dispenser is used and functions unchanged.

[0007] A further aim of the invention is to achieve the above-mentioned aim within the ambit of a simple, rational and relatively inexpensive solution.

[0008] These aims are achieved by the characteristics of the invention which are delineated in the independent claim 1. The dependent claims delineate preferred and/or particularly advantageous aspects of the invention.

[0009] In particular, a dispenser of active substances for WC bowls is disclosed, comprising a container for at least one solid, semisolid, or sufficiently viscous liquid active substance, and means for supporting the container in a position where it is subjected to the flush water, in particular for attaching the container to the rim of a WC bowl, in such a way as to support the container in a position where it is subjected to the flush water, the container of the dispenser comprising a wrapper which envelops the active substance, the wall of the container being at least partially formed with a flexible permeable film having a degree of permeability which enables retention of the active substance in a solid, semisolid or sufficiently viscous liquid state, and allows inflowing and outflowing water to pass, the outflowing water containing the active substance dissolved within it.

[0010] In this way, the dispenser of the invention main-

tains the same effectiveness as in known dispensers, since with every flow of flush water, the wrapper of flexible film is passed through by the water, which wets and dissolves the active substance, thus forming a liquid mixture which freely exits from the wrapper and spreads all over the WC bowl.

[0011] Unlike known dispensers, the dispenser of the invention has a smaller environmental impact, not only if the flexible film of the external wrapper is made of biodegradable material, for example a natural woven fibre, but also if the flexible film is made of plastic material, since the external wrapper of flexible film is lighter than the usual stiff cage, thus significantly reducing the amount of plastic which is used to manufacture the dispenser.

[0012] Further, the dispenser of the invention has a lower production cost since the process for producing the external wrapper, starting from a film of flexible material, is rather simple and economical, enables the high energy consumption which is required for injection-moulding the plastic cages to be eliminated, and does not require large investments in machines and moulds.

[0013] The fact that less plastic material is used also allows waste disposal charges to be reduced.

[0014] In a preferred aspect of the invention, the outer wrapper of the dispenser is made with a continuous flexible film of a material which is permeable to liquids, for example a porous film having a degree of permeability, that is to say, pores of a size, such that while it retains the as yet undissolved active substance within, it allows water containing the dissolved active substance to pass.

[0015] By appropriately selecting the size of the pores of the flexible film, the outer wrapper can contain not only solid active substances in rim-block form, but also disaggregated solid active substances, such as grains, tablets or powders, or semisolid substances, such as gels or viscous fluid pastes, or liquid substances with a high viscosity coefficient which can in no way be used with traditional cages and which are generally cheaper than rim-blocks.

[0016] Further, use of a continuous flexible film of permeable material enables another drawback of cage-type dispensers - release into the WC bowl of fragments of solid active substance resulting from rim-block disaggregation - to be obviated.

[0017] It is in fact known that the cages of traditional dispensers exhibit wide openings through which the water enters into contact with the active substance, giving rise to a liquid mixture which then spreads around the WC bowl. At times, if the kinetic action of the water flush is very powerful, or if the temperature and/or the hardness of the water exhibit particularly critical values, the active substance in a solid compacted state (the rim-block) can disaggregate, giving rise to fragments. The fragments pass through the wide openings of the cage, fall onto the sides of the WC bowl, thus wasting the product, and causing the unpleasant formation of coloured lines on the inner wall surfaces of the WC bowl.

[0018] With the dispenser of the invention, fragments which are produced if and when the rim-block disaggregates are retained by the external wrapper of continuous permeable film, thus obviating this drawback.

[0019] In a further aspect of the invention, the outer wrapper of flexible film can be internally divided into two or more separate containment pouches.

[0020] In this way, the dispenser can hold a plurality of active substances, each of which is individually capable of producing a different - for example detergent, deodorant and disinfectant - effect, the active substances remaining physically separate from one another and being struck by the flow of flush water, in such a way as to form a more complex active mixture, in which the individual active substances produce a synergic effect.

[0021] In a different aspect of the invention, the outer wrapper of flexible film can be inseparably attached to the fastening means, so that the dispenser can be sold as a disposable product. Alternatively, the outer wrapper of flexible film can be attached to the fastening means using openable connecting means, in such a way as to permit disassembly, replacement and reassembly of the outer wrapper, which can thus also be sold as a spare part.

[0022] Further characteristics and advantages of the invention will emerge from the following description, which is provided by way of a non-limiting example, with the aid of the appended figures of the drawings.

Figure 1 is a side view of the dispenser of the invention which is shown in use.

Figures 2 and 3 are two views of only the wrapper 2 of the dispenser of figure 1.

Figure 4 is a perspective view of the dispenser of figure 1.

Figure 5 is a rear view of the dispenser of figure 1.

Figure 6 is a view of a first alternative embodiment of the dispenser of the invention.

Figures 7 and 8 are two views of a further alternative embodiment of the dispenser of the invention.

Figure 9 schematically shows a possible plant for producing the wrapper 2 of figures 7 and 8.

Figure 10 illustrates a further embodiment of the invention.

[0023] The dispenser 1 comprises a wrapper 2, the wall of which is at least partially made of flexible film, which wrapper 2 holds an active substance 3 within, and fastening means 4 which attach to the rim of a WC bowl 100, in such a way as to support the wrapper 2 in a position which is subjected to the flow of flush water.

[0024] The active substance 3 is a substance which dissolves in contact with water, forming a liquid mixture which performs an action which depends on the formulation of the active substance 3.

[0025] For example, the action can be a detergent, disinfectant, enzymatic, anti-scale, whitening or deodorant action, or a synergic combination of two or more of the

previously-mentioned actions, and it can produce its effect on the inner wall surfaces of the WC bowl, on the water in the siphon, on the inner surfaces of the WC bowl which are below the siphon water level, or in the discharge pipes.

[0026] In an embodiment, the wall of the wrapper 2 is entirely made from limp flexible film, and the wrapper 2 is conformed as a limp bag.

[0027] In the example shown in figures 2 and 3, the wrapper 2 comprises a single strip 20 of flexible film which wraps the active substance 3, supporting it in the cradle between two folded and oppositely positioned flaps of the strip 20.

[0028] The folded flaps are joined together along the end edges, for example by gluing or welding, in such a way as to give rise to a sealed flat seam 21 which extends along the entire length of the strip 20 of flexible film, closing the upper edge of the wrapper 2 (see figure 3).

[0029] Further, the folded flaps are joined together also along the side edges, so that the active substance 3 is completely sealed inside the wrapper 2.

[0030] The flexible film can be made from various materials, such as woven fabrics, or non-woven fabrics, synthetic (plastic) or natural fabrics, which are capable of resisting the water and the active substance 3, or from a uniform thin sheet of plastic, in which through holes are made. Preferably, biodegradable materials could be used to reduce the environmental impact of the flexible film.

[0031] The active substance 3 which is contained in the wrapper 2 is in a solid, semisolid or sufficiently viscous liquid state. In general terms, the wrapper 2 of flexible film must exhibit a degree of permeability which, in relation with the state of the substance 3, is capable of:

- retaining the active substance 3;
- allowing the water of the WC to pass inwardly, thus enabling a part of the active substance 3 to be dissolved so as to form the liquid mixture; and
- while holding back the substance 3, allowing the liquid mixture to pass outwardly, in order for it to diffuse throughout the WC bowl and perform its action.

[0032] In the illustrated example, the active substance 3 is in a solid state, in the form of a single compacted cylinder which is known as a "rim-block".

[0033] It is also possible to use active substances in a disaggregated solid form, for example, grains, powders and tablets, or in a semisolid form, for example gels or pastes, which generally cost less than rim-blocks. It is even possible to use the active substance 3 in a liquid form, although it needs to be sufficiently viscous, more viscous than the water of the WC, so that the active substance 3 can be held back by the wrapper 2 while the water is allowed to pass through.

[0034] The wrapper 2 can be formed with a permeable flexible film obtained from a continuous flexible sheet made of plastic, the sheet being perforated to obtain

holes to allow the passage of liquids, in such a way as to provide the required degree of permeability.

[0035] Alternatively, the flexible film can be made with an intrinsically porous material, for example a fabric woven from twisted threads like canvas, the weave of which is such that holes are defined which provide the required degree of permeability.

[0036] Further, the flexible film can be made with a non-woven fabric which is porous to the extent of defining holes providing the required degree of permeability.

[0037] Obviously when a solid active substance (a rim-block) is used, the holes of the permeable film can be relatively wide (diameter of several millimetres) since it is sufficient for the solid fragments deriving from disaggregation of the rim-block, which exhibit a minimum dimension of several millimetres, to be prevented from passing through the holes; if however the active substance is semisolid or even liquid, the diameter of the holes must be smaller, according to the viscosity of the substance. In practical terms, if the film is provided with holes measuring a millimetre in diameter, a viscous liquid active substance of the type already in use can be used.

[0038] If the active substance 3 is in the form of a rim-block, the permeable flexible film of the invention allows the fragments of solid substance which can detach because of disaggregation of the rim-block 3 to be retained inside the wrapper 2, thus avoiding wastage of the active substance and the formation of ugly coloured lines inside the bowl of the WC.

[0039] Rim-blocks are manufactured starting from a paste-like substance using an extrusion process, in which the paste-like substance is pushed through a forming hole (extrusion die), in such a way as to obtain an elongate body with a constant cross-section, which elongate body is subsequently cut into sections. In general, going through the die raises the temperature of the paste-like material, which may undergo discolouration and rheological degradation (for example becoming too hard, too soft, and the like).

[0040] It is therefore a somewhat delicate operation, which entails significant management costs.

[0041] The invention enables solid active substances in disaggregated form (pastilles, tablets, grains, powders) or semisolid form (viscous fluid pastes, gels) to be used, which instead require no extrusion operation or the like for their production, and is thus simpler and cheaper overall.

[0042] In a preferred aspect of the invention, the wrapper 2 is made with a flexible film on which printing done with inks, which are resistant to water and the active ingredient 3, can be performed.

[0043] In this way, it is possible to print on the flexible film before the wrapper 2 is formed, in such a way as to reproduce trade-marks, logos or graphics of various types on the flexible film, or simply to endow it with the appropriate colouring.

[0044] Being able to decorate/colour the wrapper 2 provides not only an aesthetic and commercial, but also

a technical advantage.

[0045] Further, colouring and/or decorating the wrapper 2 enables the active substance 3, which is covered and enclosed within, to be left substantially "unfinished", that is, without adding to the formulation of the active substance 3 the colouring substances which are normally used to distinguish and/or aesthetically improve its appearance (especially when using a rim-block).

[0046] Elimination of these additional chemical components reduces production costs, and eliminates the chemical compatibility problems, generally in terms of acidity (pH), which colouring substances often exhibit in relation to other components of the active substance 3, especially surfactants.

[0047] In the alternative embodiment shown in figure 6, the wrapper 2 can be internally divided into two or more separate pouches 23.

[0048] The separation can be obtained by inserting one or more separation membranes made of the flexible film between the oppositely-positioned folds of the strip 20 of flexible film, or by reciprocally welding or gluing the oppositely-positioned folds not only along the outer edges, but also along one or more weld strips 24, which weld together the two oppositely-positioned surfaces of the wrapper 2 thus giving rise to one or more lines of separation of the pouches 23.

[0049] The pouches 23 can contain different active substances 3, which produce for example a deodorant, detergent and disinfectant effect, in such a way as to give rise to a synergic effect with each flushing of the toilet.

[0050] Alternatively, the pouches 23 can contain the separate components of a single active substance, in such a way as to reduce the costs of producing the active substance.

[0051] The fastening means 4 are preferably realised in a single body of plastic material by means of an (injection) moulding process, and comprise a usual spiral-shaped hook 40 which can be attached to the rim of the bowl 100 of the WC, and connecting means 41 which can directly join the hook 40 to the wrapper 2, and can if necessary free the connection, in such a way as to allow replacement of the wrapper 2.

[0052] In the illustrated example, the connecting means 41 comprise a first rigid flange (see figure 4) which is provided with a series of projecting pawls 43, which can be inserted into corresponding openings 22 which are afforded in the weld seam 21 closing the upper edge of the wrapper 2 (see figure 3).

[0053] To increase the reliability of the coupling, the connecting means 41 further comprise two second flanges 44, which are provided with relative openings 45 that engage with corresponding projecting pawls 43, in such a way as to grip the weld seam 21 of the wrapper 2 between the first flange 42 and the second flanges 44 in a vice-like way.

[0054] The coupling can be disassembled in order to allow replacement of the wrapper 2.

[0055] Alternatively, the connecting means 41 could

be without the second fold 44 and comprise only the first rigid fold 42 bearing the pawls 43, which pawls 43 can support the wrapper 2 simply by being inserted in the openings 22 of the weld seam 21.

[0056] In the alternate embodiment of figures 7 and 8, the wrapper 2 is realised in a sheet of flexible film wrapped around an active substance which is constituted by an elongate rim-block 3, the sheet of flexible film exhibiting a greater length and extending beyond the rim-block 3 at the two opposite end portions 29; the two end portions 29 of the film comprise zones which are (heat) welded together. The result is a wrapper 2 having a central pouch which encloses the rim-block 3.

[0057] Two respective through holes 46 are provided in the two end portions 29, a respective support wire 47 being inserted into the through holes 46, which support wire 47 is joined at the lower end 48 of the hook 40, which hook 40, in this case is without the means 41 described herein above.

[0058] Figure 9 shows a schematic, non-limiting example of a simple plant 10 which is suitable for producing wrappers 2 of a type formed by two superposed sheets welded together.

[0059] The plant 10 comprises a fixed plane 11, on which a first strip 12 of flexible film, which unwinds from a spool 13, is made to advance.

[0060] A succession of rim-blocks 3 made of the active substance is deposited on the first strip, the rim-blocks 3 being released one by one by a fixed feeder device 14.

[0061] Downstream from the feeder device 14, a second strip 15 of flexible film, which unwinds from a respective spool 16, is laid on top of the first strip 12, in such a way as to cover the rim-blocks 3 completely.

[0062] A sealing die 17, which moves with an alternating vertical movement, cyclically presses the first strip 12 and the second strip 15 against the fixed plane 11, such as to weld them together around each rim-block 3, thus forming the wrappers 2.

[0063] The wrappers 2 are then separated from one another by means of a tubular blade 18 which is located downstream of the sealing die 17, is provided with an alternating movement in a vertical direction, and cooperates with a through hole 19 of the fixed plane 11, in such a way that under gravity, each wrapper 2 falls into the hole 19 towards collection means (not shown), while excess material from the two strips, 12 and 15, is wound onto a motorised advancement spool 9.

[0064] In a preferred aspect of the invention, any dispenser 1 described herein above can further comprise an external protective wrapper made of water-soluble material which sealedly encloses the wrapper 2, such that the vapours produced by the active substance do not dissolve in the external environment, protecting and increasing effective duration of the active substance 3, typically during product transportation and storage.

[0065] Alternatively, the permeable film can be coated with a thin layer of material which is capable of closing the holes of the film, and thus of sealing the active sub-

stance within it, and further which dissolves when in contact with water after the first few flushes, when the dispenser is placed into use.

[0066] In the alternative embodiment shown in figure 10, the means 4 for supporting the container comprise a second container 50 of traditional type (used in WC solid-soap dispensers; the container 50 is rigid (having for example a more or less parallelepiped box-shape) and is joined to a hook 40 for attaching to the rim of the WC bowl, the walls of the container 50 being provided with openings 51 for the passage of water. Inside, the container 50 contains and supports the above-described wrapper 2 (the wall of which is formed with an at least partially permeable flexible film, which retains the active substance 3, allowing however passage of inflowing water, and passage of outflowing water mixed with the dissolved active substance) which internally contains the active substance 3.

[0067] Obviously a person skilled in the art will be able to introduce numerous technical and applicational modifications to the dispenser 1 as described herein above, without thereby forsaking the ambit of the invention as claimed herein below.

Claims

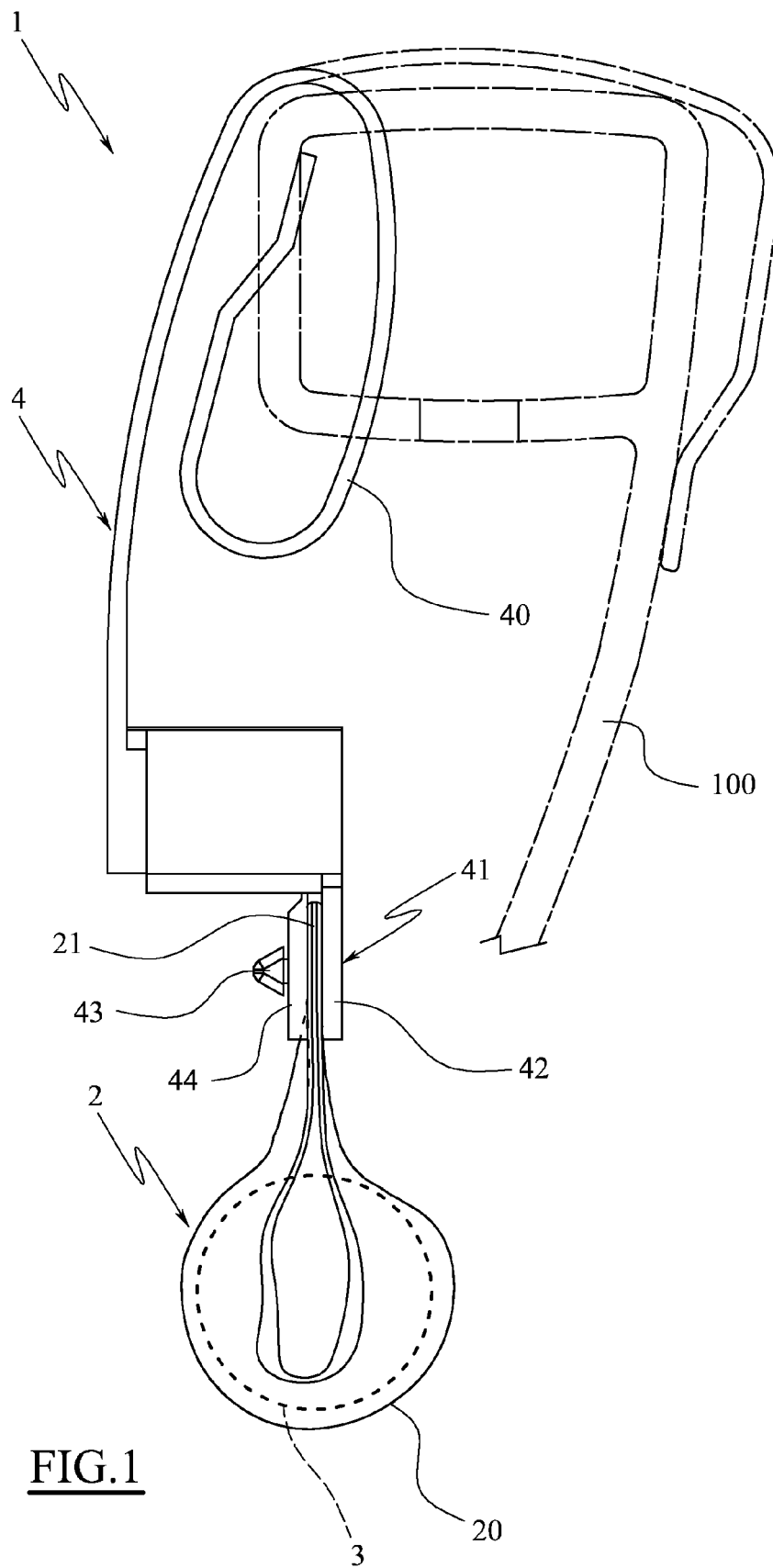
1. A dispenser of active substances for WC bowl, comprising a container (2) for an active substance (3) and means (4) for supporting the container (2) in a position where the active substance (3) is subjected to flush water, **characterised in that** the container (2) comprises a wrapper (2), a wall of which is formed, at least partially, with a permeable flexible film having a degree of permeability which is suitable for retaining the active substance (3), which is in a solid, semisolid or sufficiently viscous liquid state, and for allowing passage of inflowing water, and passage of outflowing water together with the active substance dissolved in the outflowing water.
2. The dispenser of claim 1, **characterised in that** the permeable flexible film is made of a continuous flexible sheet of plastic material, in which holes for passage of liquids are made, such as to realise a required degree of permeability.
3. The dispenser of claim 1, **characterised in that** the permeable flexible film is made of a woven fabric such as to provide the required degree of permeability.
4. The dispenser of claim 1, **characterised in that** the permeable flexible film is made of a non-woven fabric, such as to provide the required degree of permeability.
5. The dispenser of claim 1, **characterised in that** the

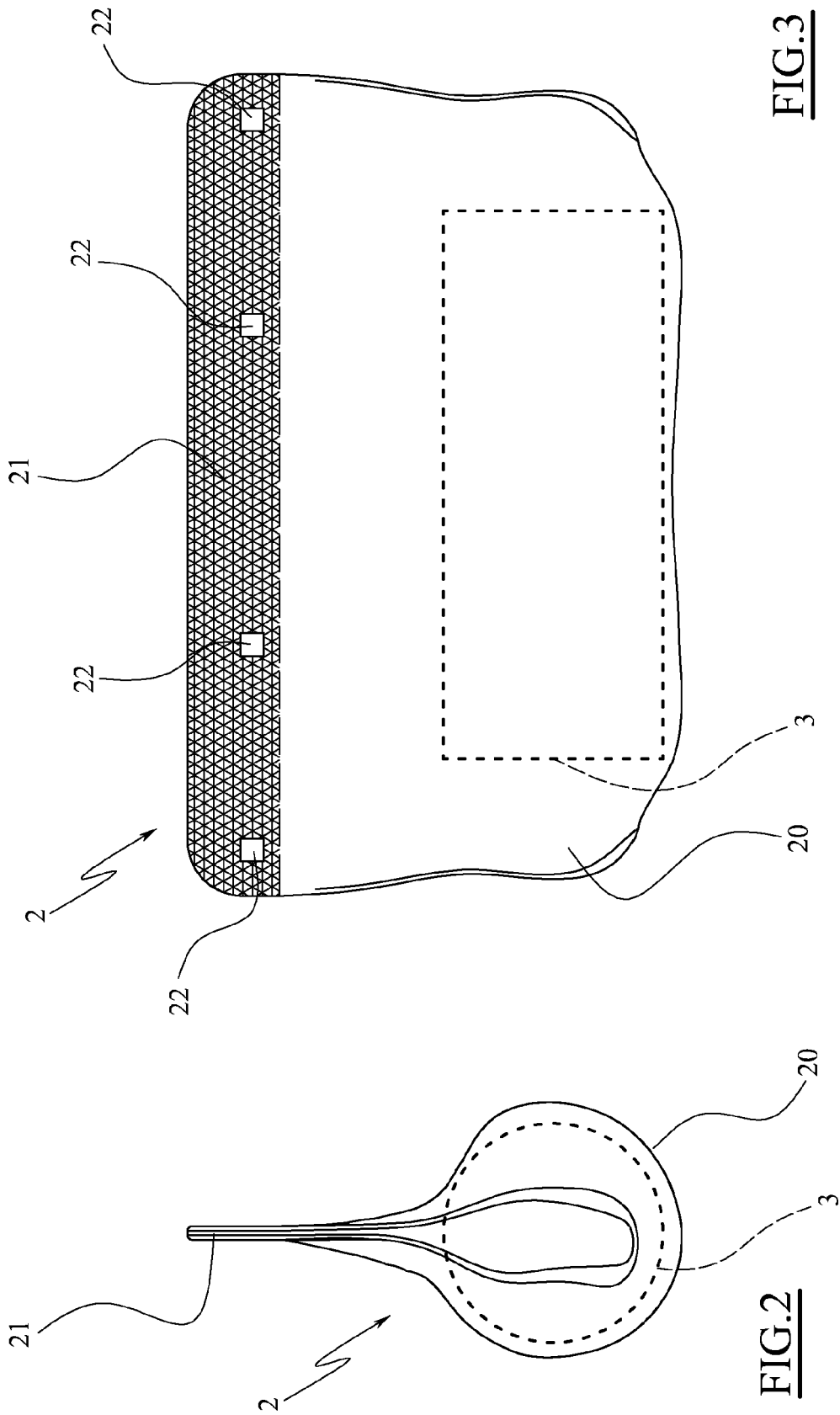
flexible material is made of biodegradable material.

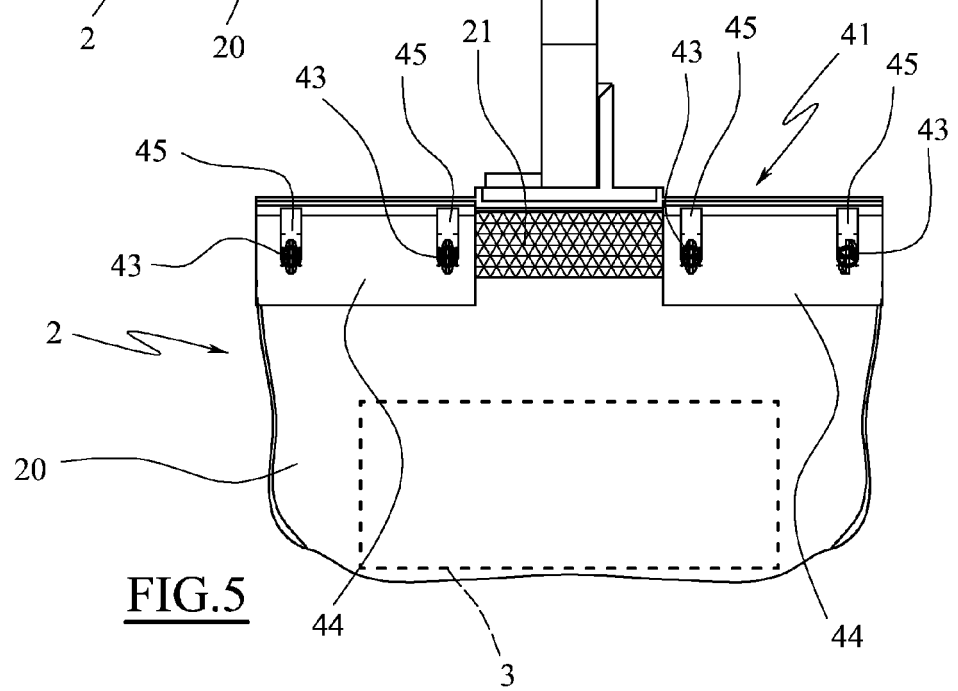
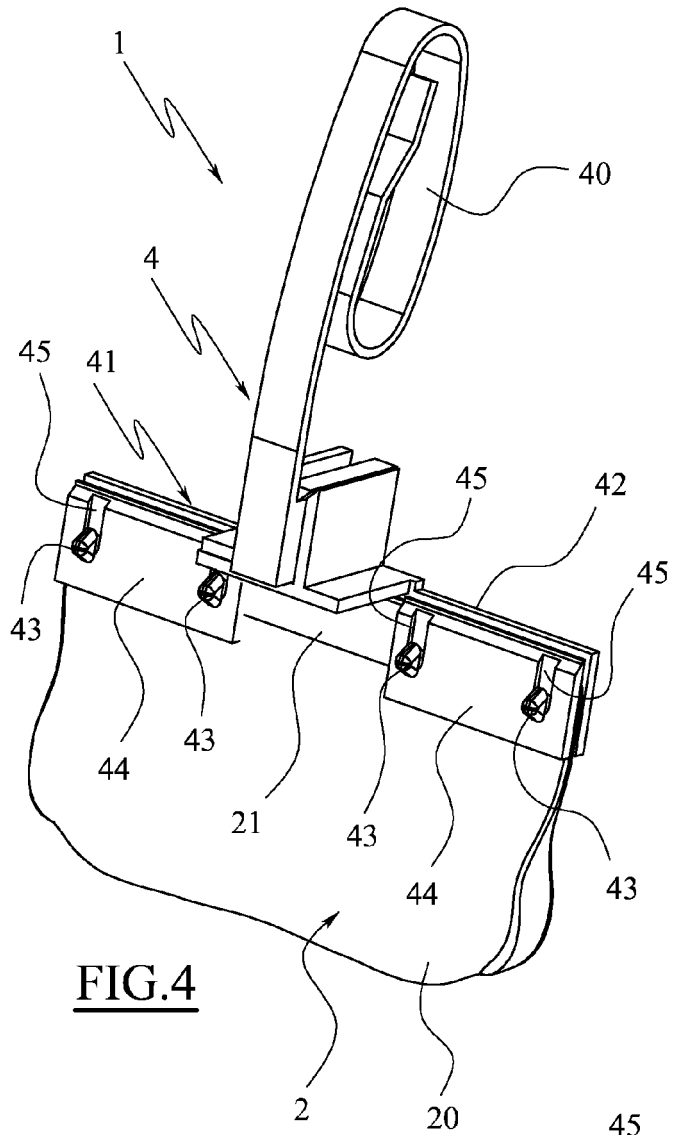
6. The dispenser of claim 1, **characterised in that** the wrapper (2) is internally divided into two or more separate containment pouches (23). 5
7. The dispenser of claim 1, **characterised in that** the means (4) for supporting the container comprise a hook (40) for attaching to a rim of a WC bowl and connecting means (41) which join the hook (40) directly to the wrapper (2). 10
8. The dispenser of claim 1, **characterised in that** the means (4) for supporting the container comprise a rigid second container (50) which is provided with openings (51) for the passage of the water, which second container (50) is joined to a hook (40) for attaching to the rim of the WC bowl, and encloses and supports the wrapper (2) containing the active substance (3). 15 20
9. The dispenser of claim 1, **characterised in that** the active substance (3) is solid and in the form of a compacted block. 25
10. The dispenser of claim 1, **characterised in that** the active substance (3) is solid in a disaggregated form, or a semisolid form.
11. The dispenser of claim 1, **characterised in that** the active substance (3) is liquid, with a degree of viscosity which does not allow passage through the permeable flexible film. 30
12. The dispenser of claim 1, **characterised in that** the wrapper (2) is made of a flexible film which can be printed upon using inks. 35
13. The dispenser of claim 1, **characterised in that** the wall of the wrapper (2) is formed entirely of a flexible film, and is thus limp. 40
14. The dispenser of claim 1, **characterised in that** it comprises a protective wrapper of water-soluble material which envelops the at least one active substance. 45

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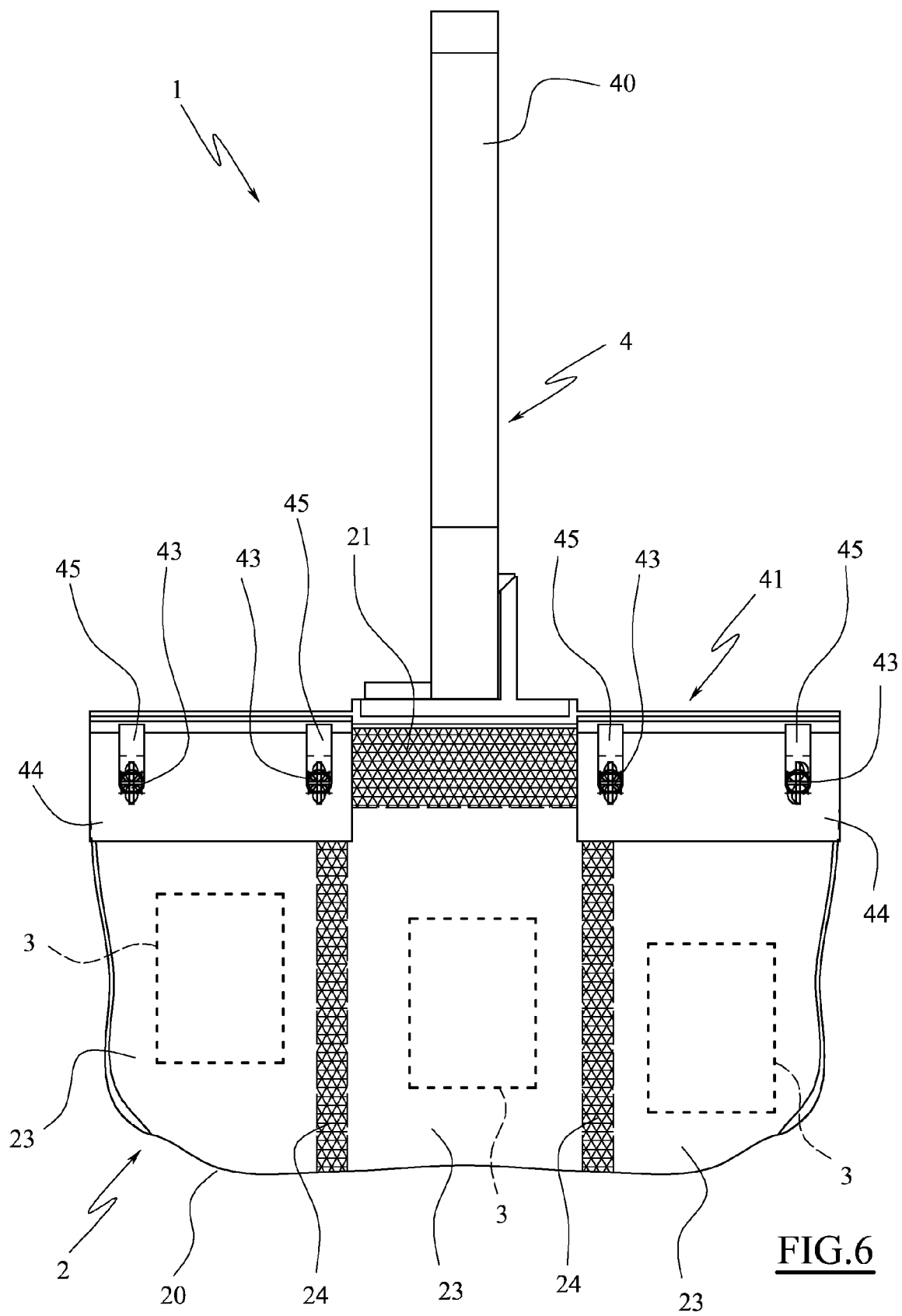


FIG. 6

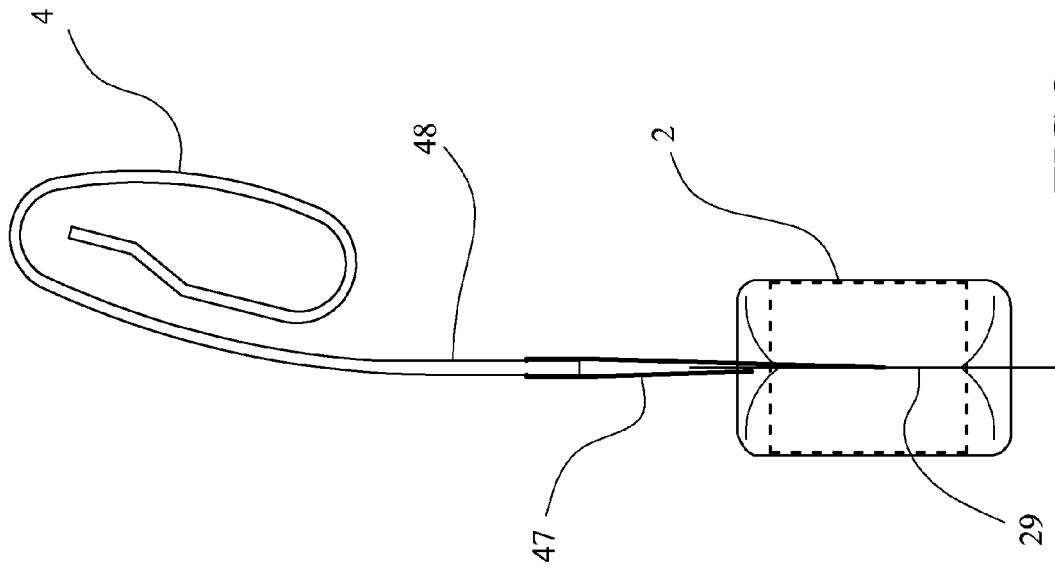


FIG. 8

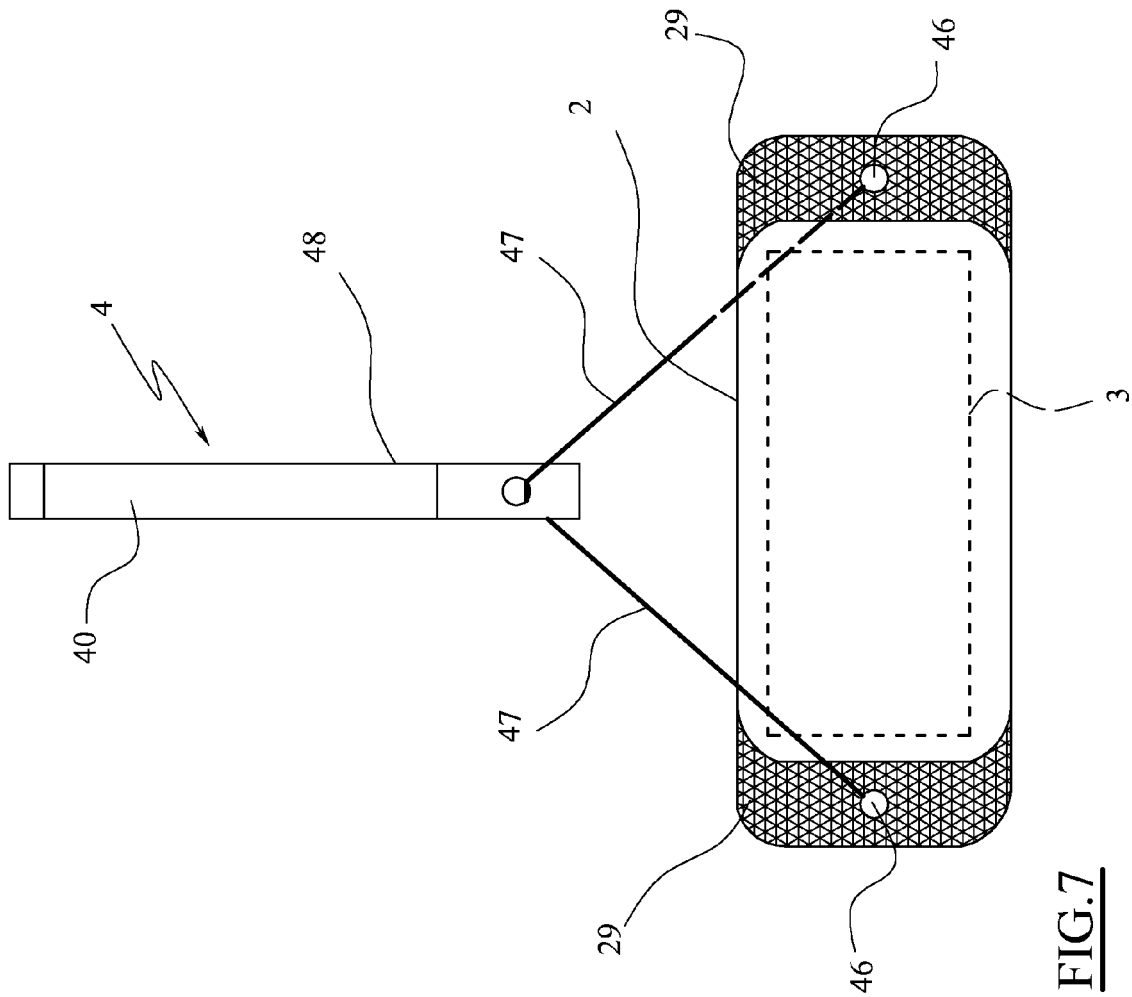


FIG. 7

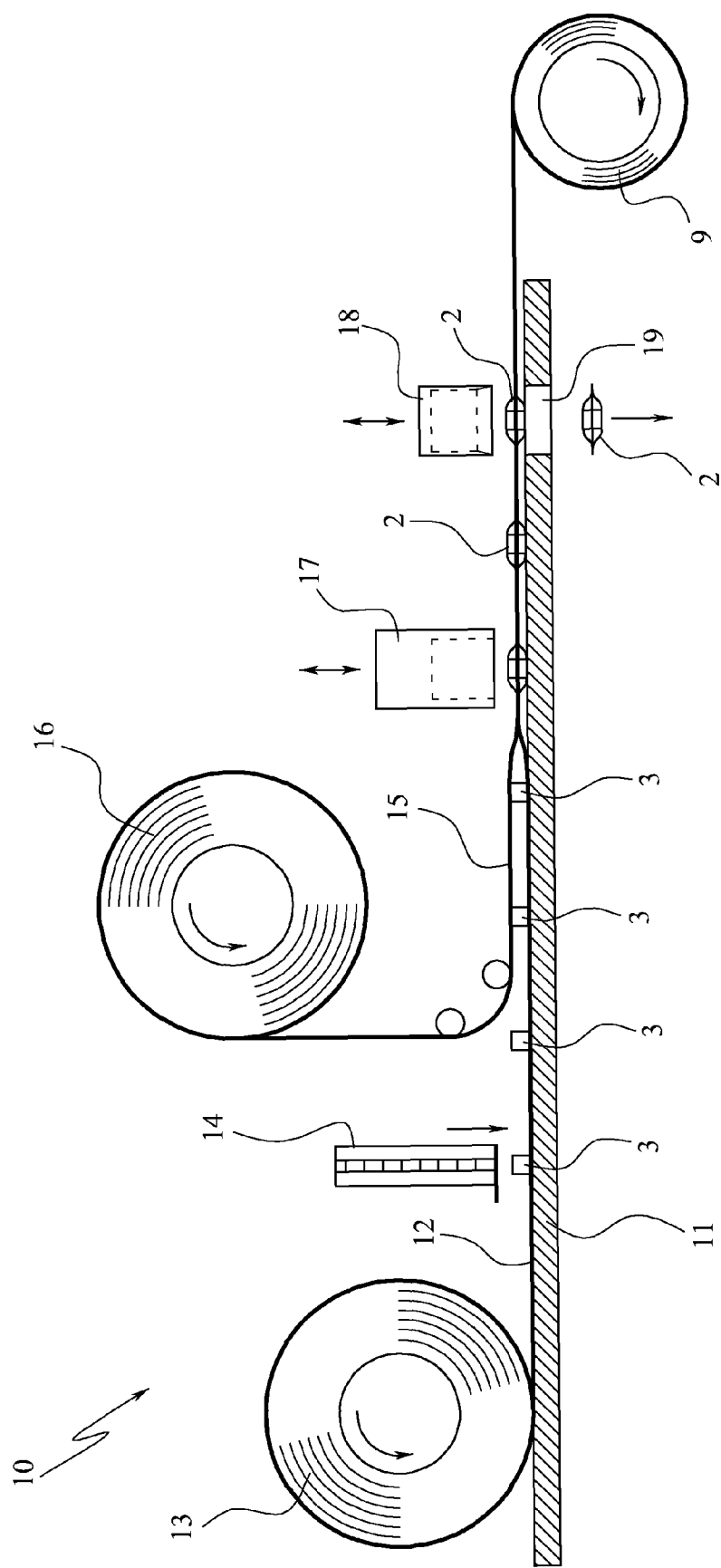


FIG.9

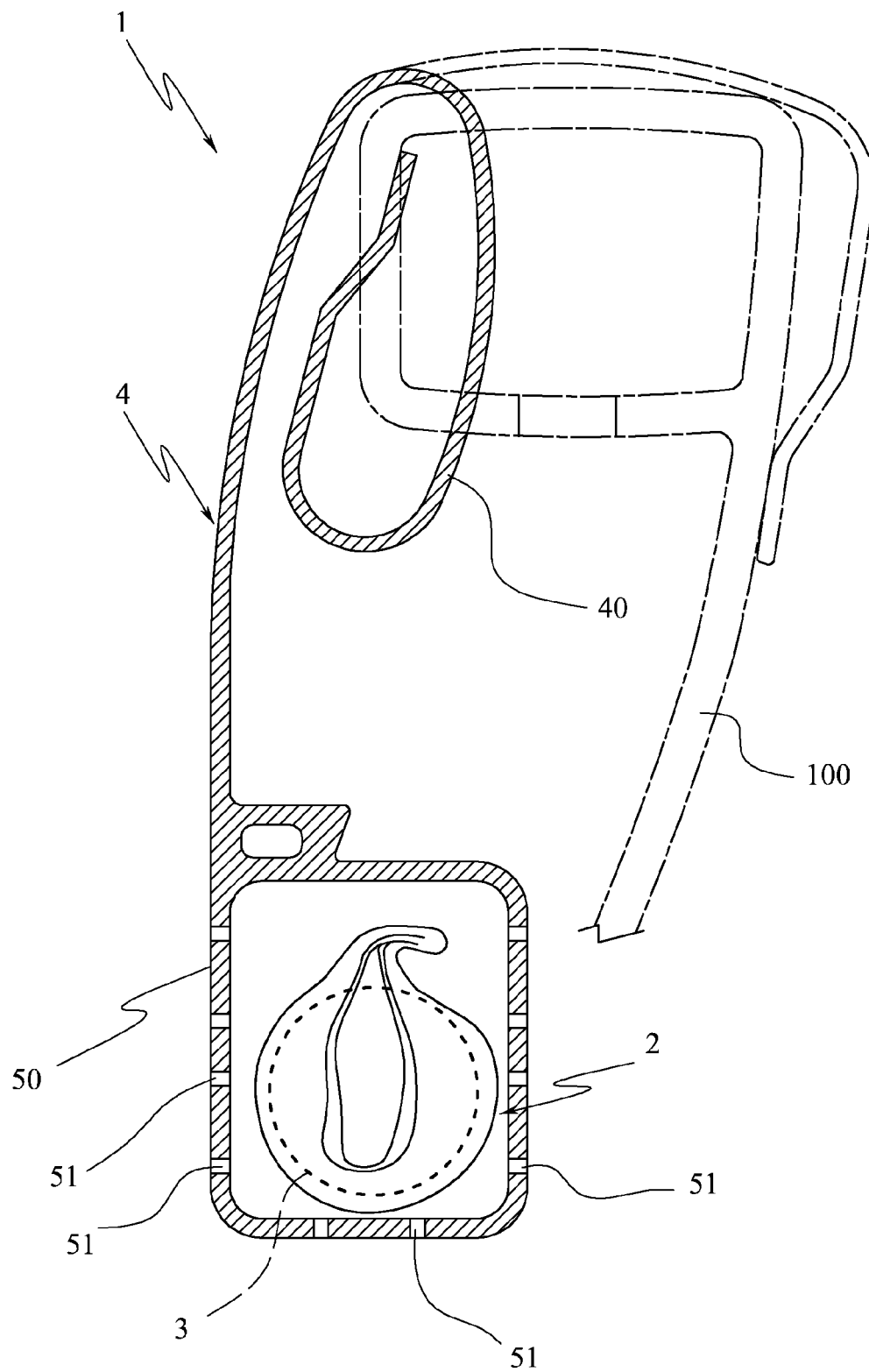


FIG.10



EUROPEAN SEARCH REPORT

Application Number
EP 09 16 1820

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 30 September 2009	Examiner Flygare, Esa
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EPO FORM 1503 03.82 (P04C01)

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

EP 09 16 1820

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The members are as contained in the European Patent Office EDP file on
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30-09-2009

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