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(54) **Device for impregnating fringes with a solution, particularly for impregnating cleaning fringes to be used in the hospital sector**

(57) A device for impregnating fringes with a solution, particularly for impregnating cleaning fringes to be used in the hospital sector, comprising a grid (2) which can be rested on a container (3) designed to accommodate the fringes (4) to be impregnated, the grid (2) forming a compartment (5) that is adapted to receive the solution with which the fringes (4) are to be impregnated, the compartment (5) being delimited in a downward region by a bot-

tom wall (6), which is crossed by a plurality of holes (7) for the passage of the solution poured into the compartment (5), the holes (7) having mutually different diameters as a function of the shape of the region of the bottom wall (6) in which they are formed and of their distance from the region at which the solution is designed to be poured onto the bottom wall (6) so as to provide uniform distribution of the dispensing of the solution below the bottom wall (6).

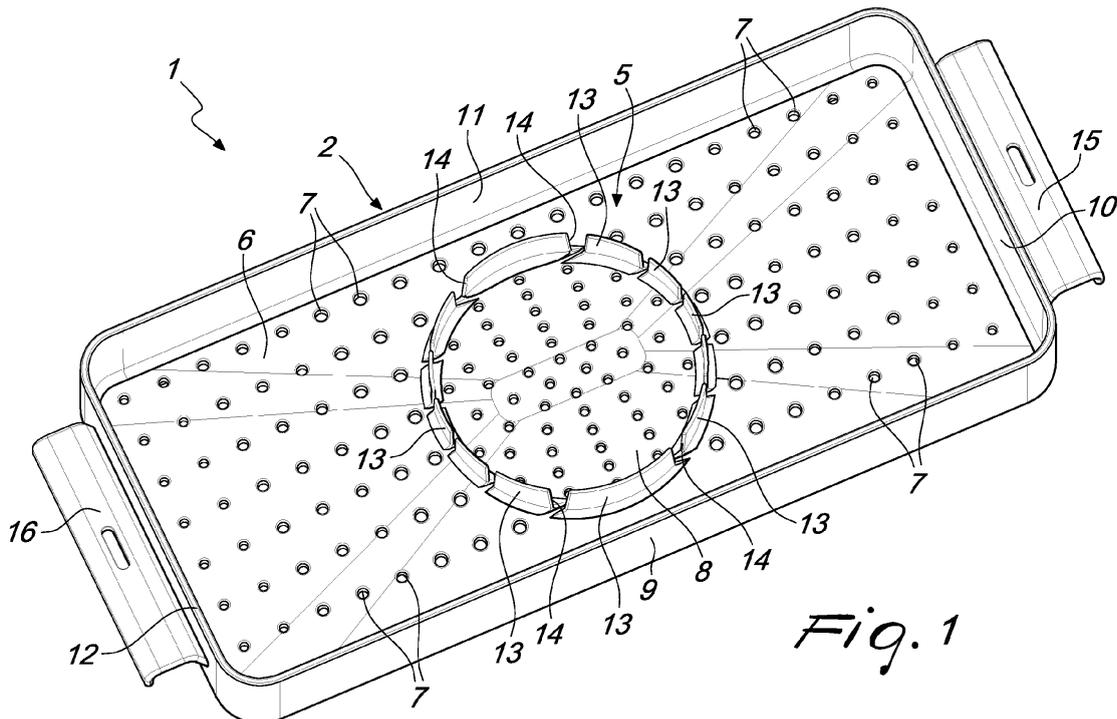


Fig. 1

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Description

[0001] The present invention relates to a device for impregnating fringes with a solution, particularly for impregnating cleaning fringes to be used in the hospital sector.

[0002] As is known, in the hospital sector the cleaning and sterilization of rooms are fundamentally important in preventing diseases and limiting the spread of pathogenic germs. In this field, washing the floors of rooms is very important.

[0003] In more advanced countries, floors are cleaned in the hospital sector by following very precise techniques, whose primary goal is to avoid as much as possible the danger of bacterial contamination.

[0004] For this reason, floors are washed by using fringes, usually made of microfiber, which are impregnated with a detergent/disinfectant solution and ensure a very high level of dirt removal. Such fringes are used only once to wash approximately 20 m² of surface and are then collected and washed in a washing machine at high temperature (95°C) before being reused. The high-temperature wash ensures the release of the collected dirt and the sterilization of the fringes.

[0005] This technique, which has become a protocolized system, uses a large quantity of fringes impregnated with a detergent/disinfectant solution, used only once for a few square meters of surface, which must however undergo, in the course of their life, many washing cycles in washing machines at high temperature.

[0006] Fringe impregnation can be performed with an extemporaneous impregnation technique, by placing in a bucket having a rectangular plan shape a plurality of fringes contained in a steel grid. The grid with the fringes is immersed in a solution prepared in the bucket, so that the fringes become impregnated with the solution, and is then lifted and anchored above the bucket so as to allow draining from the fringes.

[0007] The extemporaneous impregnation technique has the advantage of being very practical and quick, but it has the drawback of requiring transport of the solution with the cleaning implement carrying cart and of leaving the fringes excessively wet at the time of use.

[0008] In order to obviate this drawback and ensure high productivity on the part of the operators assigned to washing floors, the fringes can be preimpregnated, i.e., impregnated before use with a solution of water and detergent/disinfectant substance, so as to calibrate the wetting of the fringe without requiring rinsing or wringing of the same, operations which in addition to compromising anti-bacterial safety would slow down operations, with a consequent drop in productivity.

[0009] The refinement of pre-impregnating the fringes allows having an adequate quantity of fringes prepared beforehand and therefore ready for use, avoiding the transport of water in the cleaning implement carrying cart and with a considerable saving of water and of detergent/disinfectant substance.

[0010] Mainly two techniques are currently followed to perform fringe pre-impregnation:

- manual pre-impregnation;
- pre-impregnation in the washing machine.

[0011] The manual pre-impregnation technique consists in arranging a plurality of dry or moist fringes in a bucket having a rectangular plan shape, into which a pre-defined quantity of solution is poured directly onto the fringes. The bucket is closed by means of a hermetically closing lid. The bucket is then overturned so that the fringes absorb the solution and are thus ready for use.

[0012] This widely used technique has the drawback of requiring a lid, which with repeated use loses its hermetic capacity, easily causing leaks of solution. Moreover, the bucket, loaded with several fringes and with the solution, becomes heavy and therefore scarcely practical to handle.

[0013] In recent times a plastic grid has been introduced on the market which is crossed by holes, is meant to be arranged on the fringes to be impregnated and onto which the solution is poured. The purpose of this grid is to cause the solution to "rain" down onto the underlying fringes for obtaining a uniform impregnation. In practice, uniform impregnation does not occur, because the solution passes through the holes at the region onto which it is poured to a considerably greater extent than at the other regions of the grid, achieving an impregnation result which is not altogether satisfactory.

[0014] The technique of pre-impregnation in the washing machine is certainly the most effective system, since it eliminates any manual pre-impregnation operation. In fairly recent times, industrial washing machines have been marketed which have a washing, rinsing and impregnation program and use specific detergent dosage devices which perform every operation during the washing cycle.

[0015] With the use of these machines, the fringes leave the washing machine already adequately impregnated with solution, ready to be conveyed to the places of use and to be used.

[0016] However, such industrial washing machines are expensive and require adequate environments to be installed and managed by adequately instructed personnel.

[0017] The aim of the present invention is to solve the problems described above, by providing a device for impregnating fringes with a solution, particularly for impregnating cleaning fringes to be used in the hospital sector, which makes it possible to perform a pre-impregnation of fringes manually with results which are fully satisfactory as regards uniformity in fringe impregnation.

[0018] Within this aim, an object of the invention is to provide a device that is simple and easy to use even by non-specialized personnel.

[0019] Another object of the invention is to provide a structurally simple device that can be manufactured at

low cost.

[0020] Another object of the invention is to provide a device that ensures high durability.

[0021] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a device for impregnating fringes with a solution, particularly for impregnating cleaning fringes to be used in the hospital sector, comprising a grid which can be rested on a container designed to accommodate the fringes to be impregnated, said grid forming a compartment that is adapted to receive the solution with which the fringes are to be impregnated, said compartment being delimited in a downward region by a bottom wall, which is crossed by a plurality of holes for the passage of the solution poured into said compartment, characterized in that said holes have mutually different diameters as a function of the shape of the region of said bottom wall in which they are formed and of their distance from the region at which the solution is designed to be poured onto said bottom wall so as to provide uniform distribution of the dispensing of said solution below said bottom wall.

[0022] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the device according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the device according to the invention;

Figure 2 is a top plan view of the device according to the invention;

Figure 3 is a sectional view of the device according to the invention, taken along the line III-III shown in Figure 2, and rested on a bucket;

Figure 4 is a sectional view of the device according to the invention, taken along the line IV-IV shown in Figure 2 and rested on a bucket.

[0023] With reference to the figures, the device according to the invention, generally designated by the reference numeral 1, comprises a grid 2, which can be rested on a container 3, for example a bucket, which is designed to accommodate the fringes 4 to be impregnated. The grid 2 defines a compartment 5 which is adapted to receive the solution with which the fringes 4 are to be impregnated.

[0024] The compartment 5 is delimited in a downward region by a bottom wall 6, which is crossed by a plurality of holes 7 for the passage of the solution poured into the compartment 5.

[0025] According to the invention, the holes 7 have mutually different diameters as a function of the shape of the region of the bottom wall 6 in which they are formed and of their distance from the region at which the solution is designed to be poured onto the bottom wall 6, so as to provide uniform distribution of the dispensing of the solution below the bottom wall 6, i.e., on the fringes 4

deposited in the container 3 below the grid 2.

[0026] Preferably, the holes 7 have a diameter that increases as the slope of the region of the bottom wall 6 in which they are formed increases with respect to a horizontal imaginary plane.

[0027] Preferably, the holes 7 have a diameter that increases as the distance from the region at which the solution is designed to be poured onto the bottom wall 6 increases.

[0028] More particularly, the bottom wall 6 preferably has a substantially rectangular plan shape, which is concave in an upward region, with a raised central region 8 which slopes gradually downward toward the perimetric sides.

[0029] The compartment 5 is delimited in a downward region by the bottom wall 6 and laterally by side walls 9, 10, 11, 12 of the grid 2, which extend upward from the perimetric sides of the bottom wall 6.

[0030] The region at which the solution is designed to be poured onto the bottom wall 6 is constituted by the central region 8 of the bottom wall 6.

[0031] Conveniently, the central region 8 is delimited by a jet breaking frame, which is constituted by wings 13 arranged mutually side by side along a cylindrical surface, rises from the bottom wall 6 and is interrupted by openings 14 to allow the passage of the solution, as will become better apparent hereinafter.

[0032] The jet breaking frame, constituted by the wings 13, has the effect of limiting and slowing down the spreading of the solution while it is poured onto the grid 2, preventing it from overflowing from the grid 2 and providing a uniform distribution thereof on the bottom wall 6.

[0033] The holes 7 that pass through the bottom wall 6 at the central region 8 and proximate to the perimetric sides 9, 10, 11, 12 of the bottom wall 6, where the dispensed solution remains longer or has a lower transit speed, have a smaller diameter than the other holes 7 that pass through the bottom wall 6.

[0034] The grid 2 has, on the outer side of at least two opposite side walls thereof, which in the illustrated embodiment are constituted by the two shorter side walls 10, 12, resting wings 15, 16, which can engage the upper edge or mouth of the container 3 designed to accommodate the fringes 4 to be impregnated.

[0035] The bottom wall 6 has a substantially constant thickness along its extension and is convex in an upward region and concave in a downward region.

[0036] The grid 2 is preferably made of molded synthetic material.

[0037] The extremely simple use of the device according to the invention is as follows.

[0038] The fringes 4 to be impregnated are superimposed in the container 3, on the mouth of which the grid 2 is then rested.

[0039] The solution with which the fringes 4 are to be impregnated is poured onto the bottom wall 6 at the central region 8, from which, through the openings 14, it is distributed onto the entire bottom wall 6. During its diffu-

sion on the entire bottom wall, the solution passes through the holes 7, falling below the grid 2 and thus impregnating the fringes 4 arranged in the underlying container 3.

[0040] It should be noted that according to the invention the holes 7 have a diameter that is sized as a function of the shape of the region of the bottom wall 6 in which they are formed and as a function of the distance from the region at which the solution is poured, so that where the solution remains longest there are holes having a smaller diameter and where the solution remains for the shortest time the holes have a larger diameter.

[0041] This causes the solution to "rain" down below the grid 2, distributing uniformly over the entire region on which the grid 2 is superimposed, i.e., the region occupied by the fringes 4.

[0042] Thanks to this uniform distribution of the dispensed solution, a uniform impregnation of the fringes 4 is achieved.

[0043] In practice it has been found that the device according to the invention fully achieves the intended aim, since it makes it possible to perform a pre-impregnation of fringes manually with results which are fully satisfactory as regards uniformity in fringe impregnation.

[0044] A further advantage of the device according to the invention is that it is inexpensive and can be used without problems even by non-specialized personnel.

[0045] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0046] In practice, the materials used, although the use of synthetic material is preferred, may be any according to requirements and to the state of the art.

[0047] The disclosures in Italian Patent Application No. MI2009A001761 from which this application claims priority are incorporated herein by reference.

[0048] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device for impregnating fringes with a solution, particularly for impregnating cleaning fringes to be used in the hospital sector, comprising a grid (2) which can be rested on a container (3) designed to accommodate the fringes (4) to be impregnated, said grid (2) forming a compartment (5) that is adapted to receive the solution with which the fringes (4) are to be impregnated, said compartment (5) being delimited in a downward region by a bottom wall (6), which

is crossed by a plurality of holes (7) for the passage of the solution poured into said compartment (5), **characterized in that** said holes (7) have mutually different diameters as a function of the shape of the region of said bottom wall (6) in which they are formed and of their distance from the region at which the solution is designed to be poured onto said bottom wall (6) so as to provide uniform distribution of the dispensing of said solution below said bottom wall (6).

2. The device according to claim 1, **characterized in that** said holes (7) have a diameter that increases as the slope, with respect to an imaginary horizontal plane, of the region of said bottom wall (6) in which they are formed increases.

3. The device according to claim 1, **characterized in that** said holes (7) have a diameter that increases as the distance from the region at which the solution is designed to be poured onto said bottom wall (6) increases.

4. The device according to one or more of the preceding claims, **characterized in that** said bottom wall (6) has a substantially rectangular plan shape which is convex in an upward region, with a central region (8) that is raised and slopes toward the perimetric sides of said bottom wall (6).

5. The device according to one or more of the preceding claims, **characterized in that** the region at which the solution is designed to be poured onto said bottom wall (6) is constituted by said central region (8) of said bottom wall (6), said central region (8) being delimited by a jet breaking frame, which rises from said bottom wall (6) and has openings (14) for the passage of the solution.

6. The device according to one or more of the preceding claims, **characterized in that** the holes (7) that pass through said bottom wall (6) at said central region (8) and proximate to the perimetric sides of said bottom wall (6) have a smaller diameter than the other holes (7) that pass through said bottom wall (6).

7. The device according to one or more of the preceding claims, **characterized in that** said grid (2) has side walls (9, 10, 11, 12) which extend upward from the perimetric sides of said bottom wall (6).

8. The device according to one or more of the preceding claims, **characterized in that** said grid (2) has, on the outer side of at least two opposite side walls (10, 12) thereof, resting wings (15, 16) which can engage the container (3) designed to accommodate the fringes (4) to be impregnated.

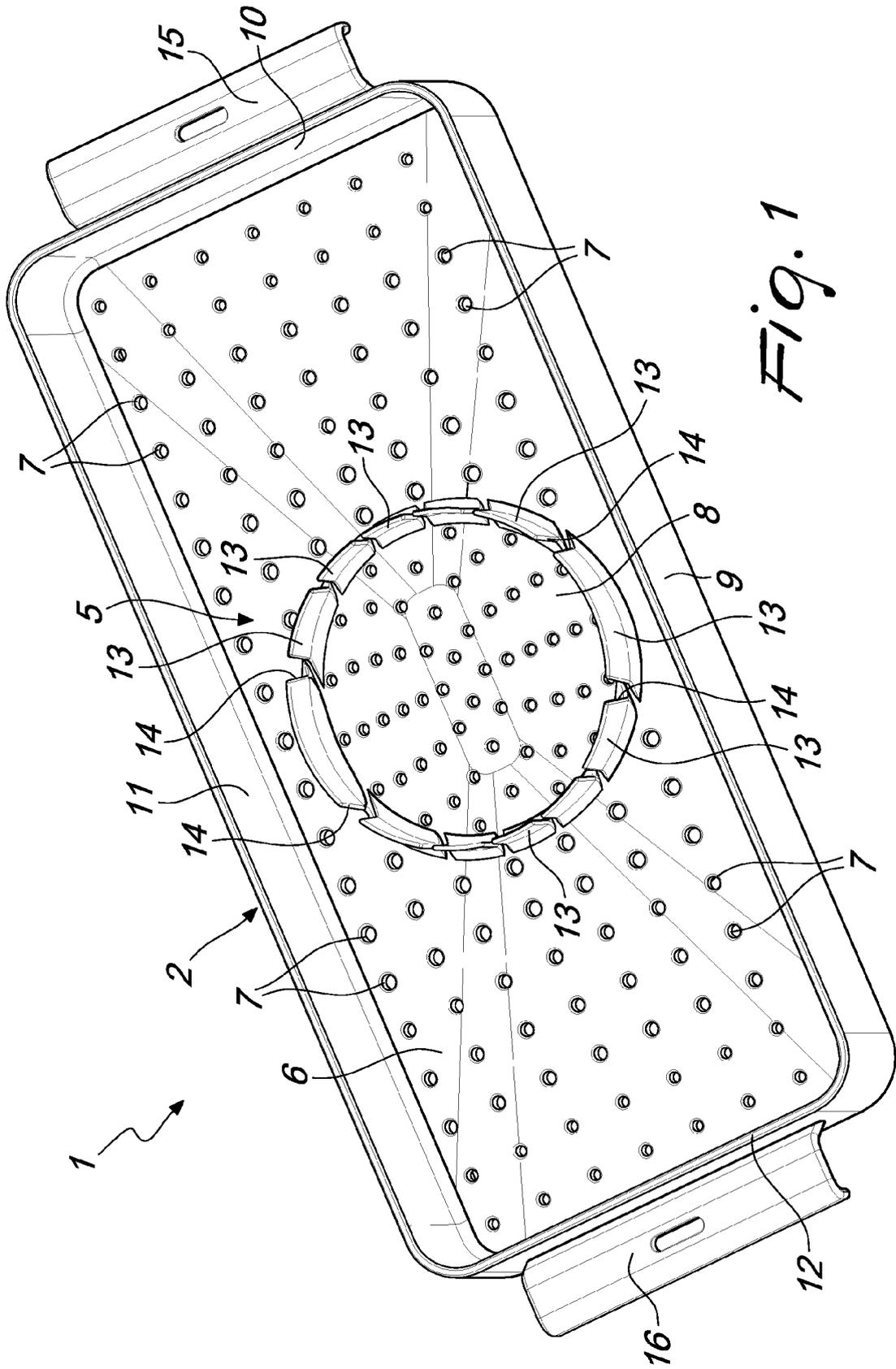


Fig. 1

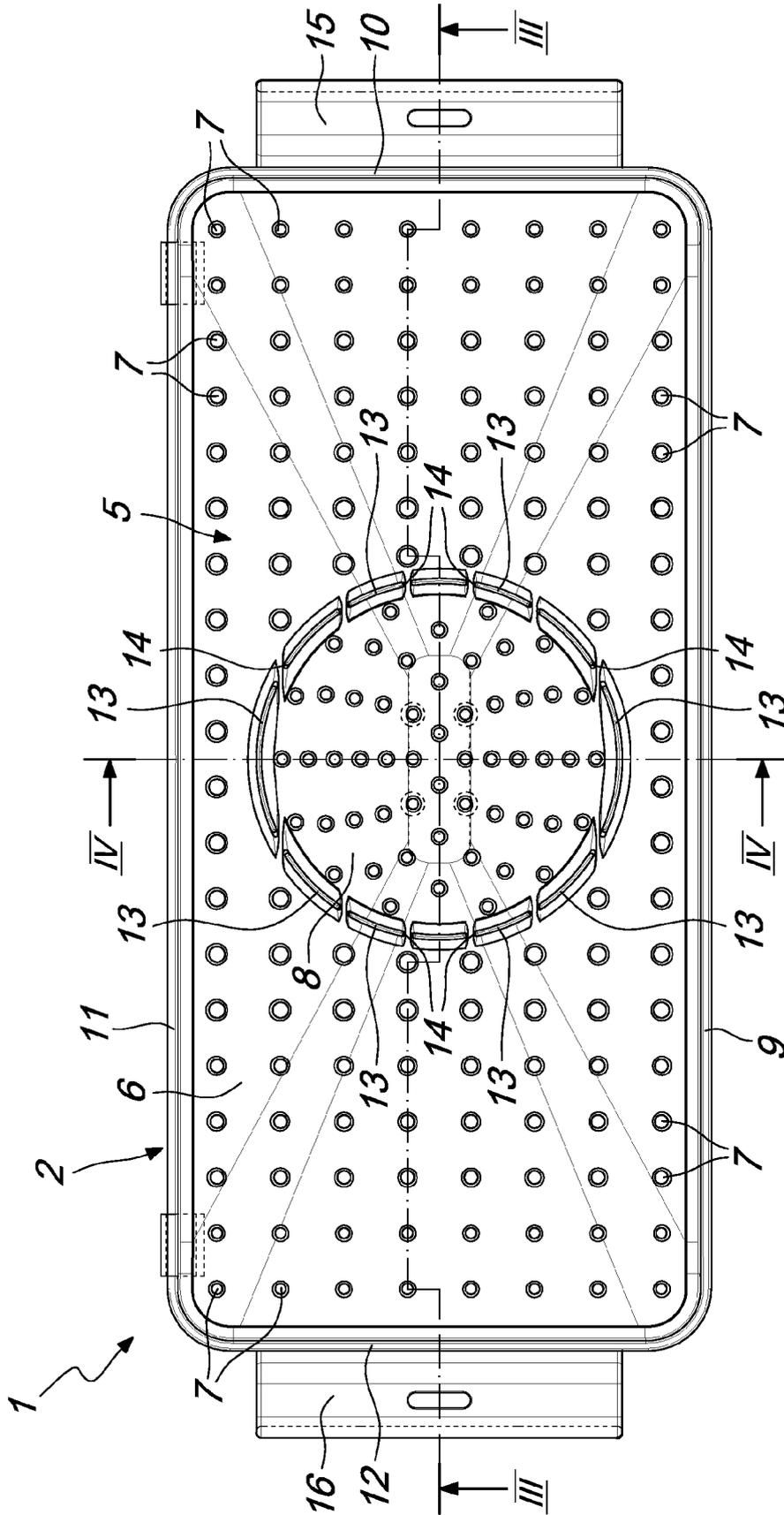


Fig. 2

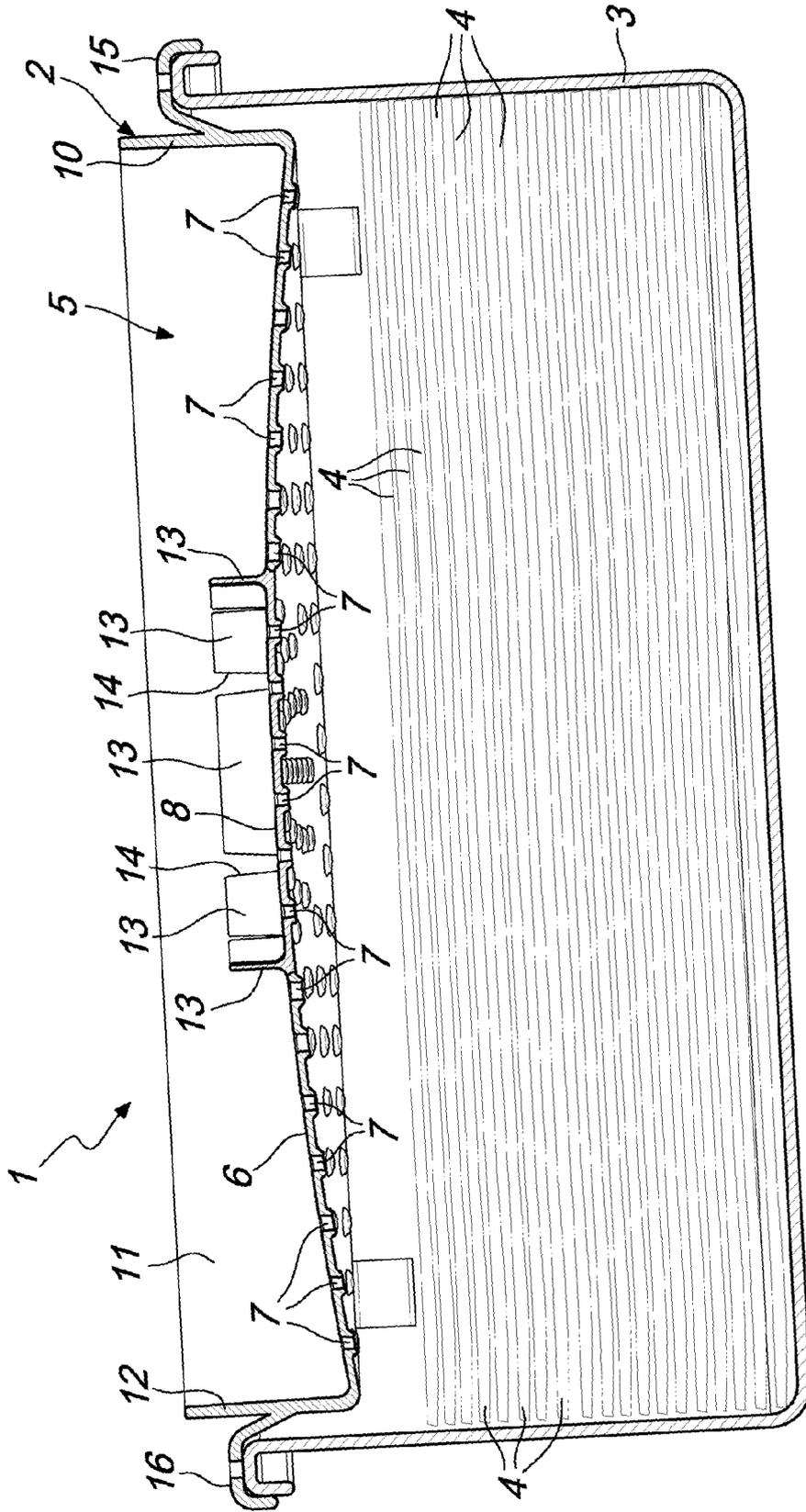


Fig. 3

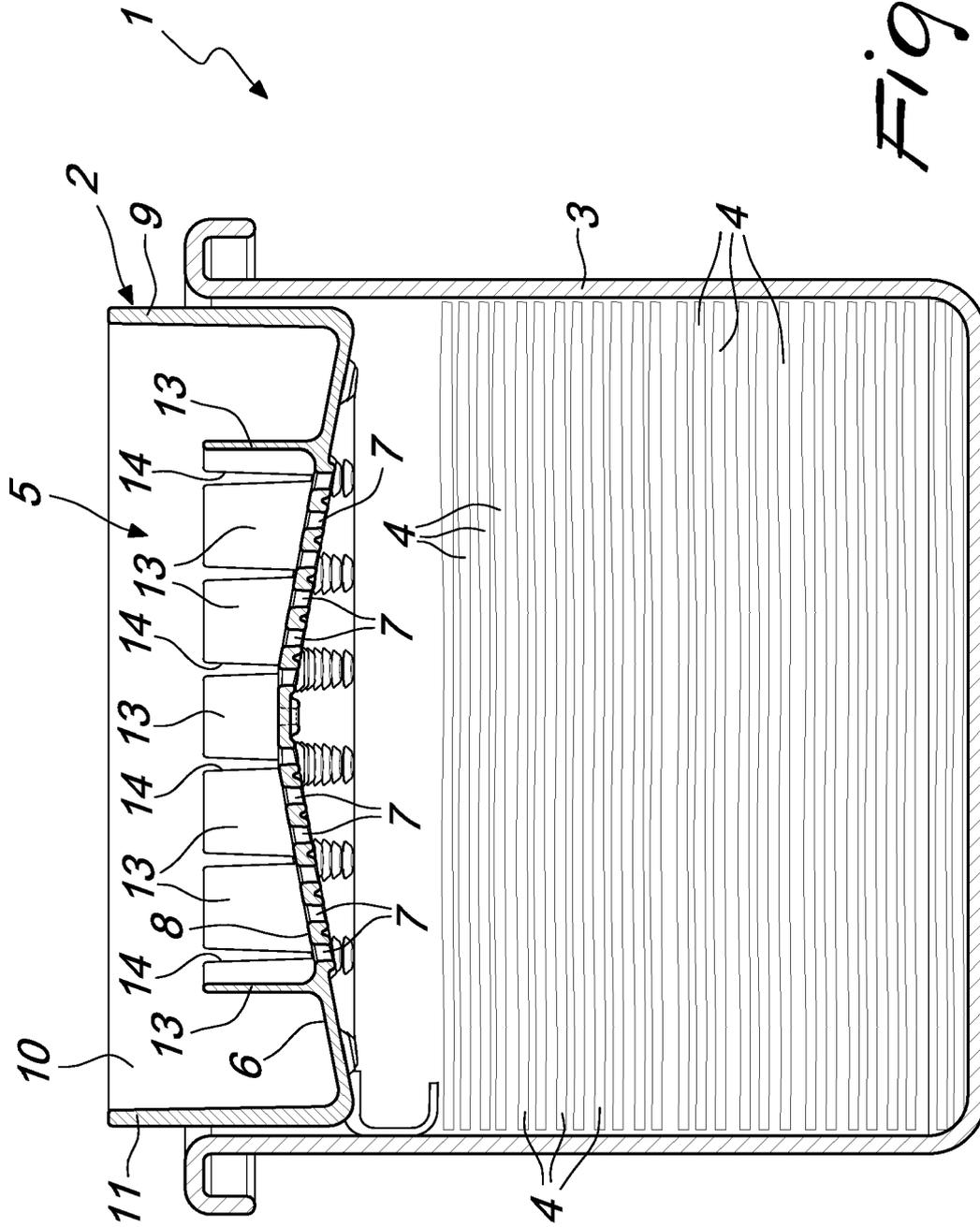


Fig. 4



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Application Number
EP 10 17 8917

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