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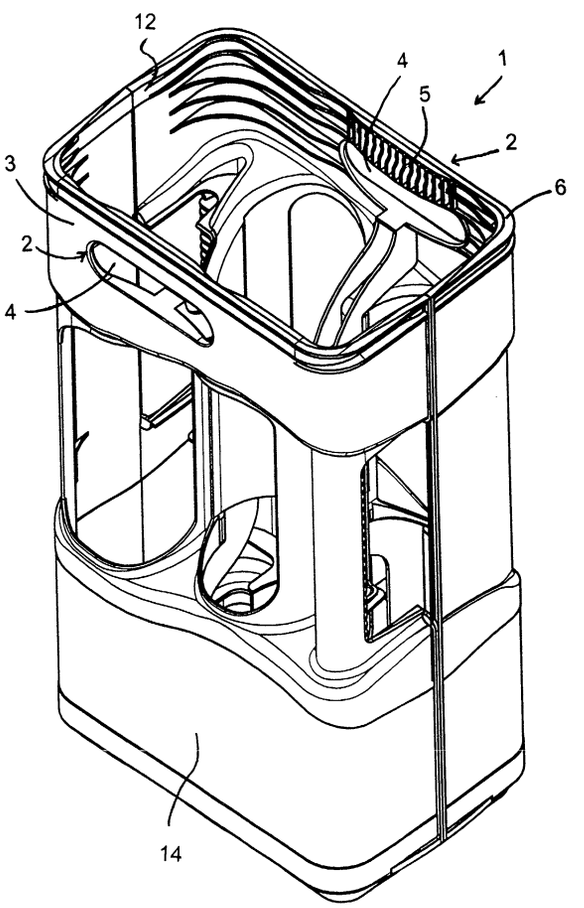
(54) Container for gascylinders or the like and method for their manufacturing

(57) The invention relates to a holder into which gas cylinders or the like can be placed. The holder may in particular comprise at least two parallel rows for receiving at least two gas cylinders. The distance between the centre lines of the rows is smaller than the diameter of the gas cylinder. Moreover, the centre lines of two adjacent cylinders in a first row, form an equilateral triangle with the centre line of a cylinder in an adjacent row. The bottom of the holder, at the position of the cylinders, is provided with openings to allow lifting means to be inserted from below in order to bring the cylinders into an elevated position. The invention also provides a method of manufacturing a holder for cylinders or the like.

Fig. 1



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Description

[0001] The present invention relates to a holder for gas cylinders and the like, comprising at least two adjacent and substantially parallel rows, each of which having at least two spaces for receiving gas cylinders, wherein the distance between the centre line of the rows is smaller than the diameter of the cylinder, and wherein the centre lines of two adjacent cylinders in a row, form an equilateral triangle with the centre line of a cylinder from an adjacent row. The invention also relates to a method of manufacturing a holder for gas cylinders or the like.

[0002] Practice has shown that such holders are generally suitable. However, said holders have the disadvantage that it is awkward to fill the cylinders when they are empty. To do this, the cylinders must in a first step be removed from the holder, subsequently they have to be filled and finally, after filling, they have to be replaced in the holder. This takes up much room at the filling station. In addition, the different steps cause filling to be very time-consuming.

[0003] It is the object of the invention to provide an improved holder. It is more in particular the object of the invention to provide an improved holder with which the cylinders can be handled, e.g. when they are being filled, while the cylinders are in the crate. An additional object of the invention is to provide a holder with which an improved utilization of space is realized. It is also the object of the invention to provide an improved holder allowing the cylinders to be inspected from the outside.

[0004] In order to achieve the aforementioned objectives, the invention provides a holder in accordance with the preamble, which is characterized in that the bottom of the holder, at the position of the cylinders, is provided with openings to allow lifting means to be inserted from below in order to bring the cylinders into an elevated position. The holder according to the invention provides the advantage that, in order to be filled, it is not necessary to remove the cylinders from the holder. The cylinders may be filled while they are in a position sufficiently elevated for their filling openings to extend just above the top rim of the holders.

[0005] In accordance with a preferred embodiment, the holder according to the invention is provided with carrying means that consist of openings provided near the top sides of the holder's vis-à-vis walls, and wherein vertical ribs extend at the inside of the walls above the openings. This results in the wall of the holder above the openings becoming reinforced. Surprisingly, this also considerably improves the stability during carrying. According to a further preferred embodiment of such carrying means, the ribs in the central portion above the openings are longer than the ribs more towards the sides of the opening and extending upward. In addition to improved strength and rigidity of the wall this surprisingly improves the stability during carrying even further.

[0006] According to the invention a holder or "crate" for e.g. gas cylinders may be conveniently manufactured accordance with a new and inventive method. Said method is characterized in that it comprises the steps of providing two substantially identical halves for a holder, each of which halves is provided with a wall part, a bottom part and a rim part extending over a substantial portion of the wall part and the bottom part, and connecting the rim parts of the two halves such as to form the holder. The two halves may be connected by any suitable method that provides a firm connection, for example, by fusion or adhesion. It is preferred for the rim parts to be fused together. It is especially preferred for the two halves to be joined together by means of hot plate welding.

[0007] Finally, the invention relates to a method of filling gas cylinders or the like, comprising the provision of a holder containing cylinders to be filled, bringing the cylinders into an elevated position such that the filling openings of the cylinders extend to above the top rim of the holder, and connecting the filling opening with the filling source, lifting the cylinder by means of lifting means, which push through openings in the bottom of the holder against the cylinders, thereby lifting the same.

[0008] Further advantages of the invention will become clear from the description of the preferred embodiments hereafter, which will be elucidated with reference to the drawings.

[0009] The drawings comprise several Figures.

Figure 1 shows a perspective view of a holder according to a preferred embodiment of the invention.
Figure 2 shows a top view of the holder according to Figure 1.
Figure 3 shows a side view of the holder according to Figure 1.
Figure 4, shows a perspective view of a half of a holder according to the invention.

[0010] Figure 1 shows a holder 1 according to a preferred embodiment of the invention, in perspective. The holder is at the top completely open to facilitate placing the gas cylinders into the holder. In the embodiment represented, the holder is suitable to accommodate four gas cylinders (not shown). As shown more clearly in the top view of the holder illustrated in Figure 3, four gas cylinders can be placed in the holder. For this purpose, the holder 1 is provided with four spaces, which in the embodiment illustrated are divided into two rows of two spaces each. The first row, indicated with arrow I, extends parallel with the longitudinal axis of the holder. The second row, indicated with arrow II, also extends parallel to the longitudinal axis of the holder 1. As shown in Figure 3, the distance d is smaller than the diameter D of an individual gas cylinder. As a result the holder can have a smaller width than when four gas cylinders are placed in a square. This is still advantageous, even though the holder shown by the configuration in Figure 3 is longer than a holder whereby the individual gas cyl-

inders are placed in the shape of a square. Because of the standard dimensions of a gas cylinder, the present configuration makes it possible to manufacture the holder with outside dimensions such that the same provides sufficient strength and protection against damage to the gas cylinders. In addition it is possible to use the whole surface of a standard pallet for positioning the holders according to the invention thereon. The holder may, for example, be manufactured in a size of 20 x 30 cm. This allows an optimal utilization of the surface of a standard pallet. In this case a total of two rows of four crates each can be placed on a pallet, while in the case of a crate shaped like a square, only two rows of three crates each can be placed, without completely utilizing the surface area.

[0011] As can be seen in Figure 3, the holder 1 according to the invention has an axis of symmetry S extending vertically through the holder. This axis of symmetry S forms a mirror image axis of the holder in the form illustrated. In practice this is realized by the holder 1 according to the invention being comprised of two identical parts (see Figure 4), which are joined along the line 1-1.

[0012] In Figure 4, a half 1A of the holder according to the invention is shown. A holder 1 according to the invention, but also any other holder for holding and transporting etc. gas cylinders and the like, may be manufactured conveniently and economically from two identical halves in accordance with a method in which said two identical halves are joined together. These halves may be formed in accordance with a conventional injection moulding technique. In the embodiment shown, two identical parts 1A are placed to abut along the rim 14, and joined together by means of, for example, plastic welding. The rim 14 has to extend over a substantial part of the wall and the bottom in order to provide a strong bond between the two halves. The joining together may be carried out in any suitable manner of plastic welding known in the art. By this method it is very simple to manufacture a holder that actually has a complex shape.

[0013] According to a preferred embodiment, the holder 1 is provided with carrying means 2. As shown in Figure 1, the carrying means 2 are comprised of a substantially horizontal opening near the top side of a wall 3 of the holder 1. As shown, the opening is located at a position practically between the two spaces for gas cylinders. The advantage of this is that when the holder is carried by hand, the fingers that are inserted through the opening from the outside will not touch the gas cylinder. An extra advantage is that a stable support position is obtained. The openings for carrying the holder 1 are preferably provided in opposite sides.

[0014] According to a further preferred embodiment, and as also shown in Figure 1, the inside of the wall 3 of the holder 1 above the openings 4 are provided with vertical ribs 5. These vertical ribs extend from a position substantially adjacent the top rim of the opening 4 to a position closer to the top rim 6 of the holder. This reinforces the wall portion above the openings. The extra advantage of this is a greater stability when the holder is being carried. It appears that when holding and carrying the holder, said ribs 5 provide the fingers with a sideways stability. Near the centre of the opening 4, the ribs 5 are preferably longer than at the ends of the opening 4. This can be clearly seen in Figure 3. This further improves the stability.

[0015] In its interior, the holder 1 is provided with guide means 7, 8, 9, for guiding the gas cylinders when they are moved substantially vertically, such as when placing them into and removing them from the holder. The guide means 7 extend from a side wall 3 of the holder 1 to a cylinder that is to be placed against the opposite side wall of the holder 1.

[0016] In the embodiment shown in Figure 2, which is a side view of the holder according to Figure 1, the holder is at its underside provided with support means 10. According to a preferred embodiment, the outer edges 11 of the support means 10 just fall within the inside 12 of the top rim 6 of the holder 1. In this way several holders can be stacked without the risk of them sliding of each other.

[0017] As can also be clearly seen in the Figures 1 and 2, the walls of the holder 1 according to the invention are provided with openings (viewing openings). This facilitates a careful inspection to be carried out while the gas cylinders are in the holder 1. This makes it possible, for example, to read labels applied to the cylinder wall. It also makes it easy to inspect other identification means on the cylinder. The openings in the wall of the holder are preferably located approximately at the top half of the cylinders.

[0018] Finally, the bottom of the holder 1 is provided with openings 13. Said openings 13 facilitate the insertion of lifting means (not shown), with which gas cylinders in the holder can be lifted. For example, by this means it is possible to lift cylinders sufficiently high until their tops, e.g. their filling openings, extend above the top rim 6 of the holder 1. This allows the gas cylinders to be filled without having to remove them completely from the holder.

[0019] The walls of the holder 1 according to the invention have surfaces 14 located under the viewing openings. These may be used for applying identification means on the exterior of the holder. They are preferably slightly recessed in relation to the largest outside dimension of the holder. In this way the identification means to be applied on the surfaces 14 will not easily be damaged during use.

Claims

1. A holder (1) for gas cylinders and the like, comprising at least two adjacent and substantially parallel rows, each of which having at least two spaces for receiving gas cylinders, wherein the distance be-

tween the centre line of the rows is smaller than the diameter of the cylinder, and wherein the centre lines of two adjacent cylinders in a row, form an equilateral triangle with the centre line of a cylinder from an adjacent row, **characterized in that** the bottom of the holder, at the position of the cylinders, is provided with openings to allow lifting means to be inserted from below in order to bring the cylinders into an elevated position.

2. A holder (1) according to claim 1, **characterized in that** the vertical central axis of the holder forms a mirror image axis.

3. A holder (1) according to any one of the preceding claims, **characterized in that** the same is suitable for holding two rows of each two gas cylinders.

4. A holder (1) according to any one of the preceding claims, **characterized in that** the same is provided with carrying means that consist of openings provided in the holder's vis-à-vis walls, and wherein vertical ribs extend at the inside of the walls above the openings.

5. A holder (1) according to claim 4, **characterized in that** the ribs are longer near the opening than near the end of the ribs positioned away from the opening.

6. A holder (1) according to claim 4 or 5, **characterized in that** the ribs at the sides of the openings are shorter than the ribs in the central part above the openings.

7. A holder (1) according to any one of the preceding claims, **characterized in that** where the cylinders are, the walls are provided with openings to facilitate the inspection of the cylinders from the outside.

8. A holder (1) according to claim 7, **characterized in that** the openings extend at least over identification means on the cylinders.

9. A holder (1) according to claim 7 or 8, **characterized in that** at least one wall of the holder has a surface located under the openings to allow the application of an identification.

10. A holder (1) according to any one of the preceding claims, **characterized in that** a guide means is provided, which is attached to a wall of the holder, and which extends to a position between two cylinders of the same row to be placed next to one another in the holder, and to a cylinder that is to be placed into the adjacent row.

11. A method of manufacturing a holder for essentially cylindrical objects, **characterized in that** the same comprises the steps of providing two substantially identical halves (1A) for a holder (1), each of which halves (1A) is provided with a wall part (15), a bottom part (16) and a rim part (14) extending over a substantial portion of the wall part (15) and the bottom part (16), and connecting the rim parts of the two halves such as to form the holder (1).

12. A method according to claim 11, **characterized in that** the two halves are joined together by means of fusing the rim portions.

13. A method according to claim 11 or 12, **characterized in that** the two halves are joined together by means of hot plate welding.

14. A method of filling gas cylinders or the like, comprising the provision of a holder containing cylinders to be filled, bringing the cylinders into an elevated position such that the filling openings of the cylinders extend to above the top rim of the holder, and connecting the filling opening with the filling source, lifting the cylinder by means of lifting means, which push through openings in the bottom of the holder against the cylinders, thereby lifting the same.

Fig. 1

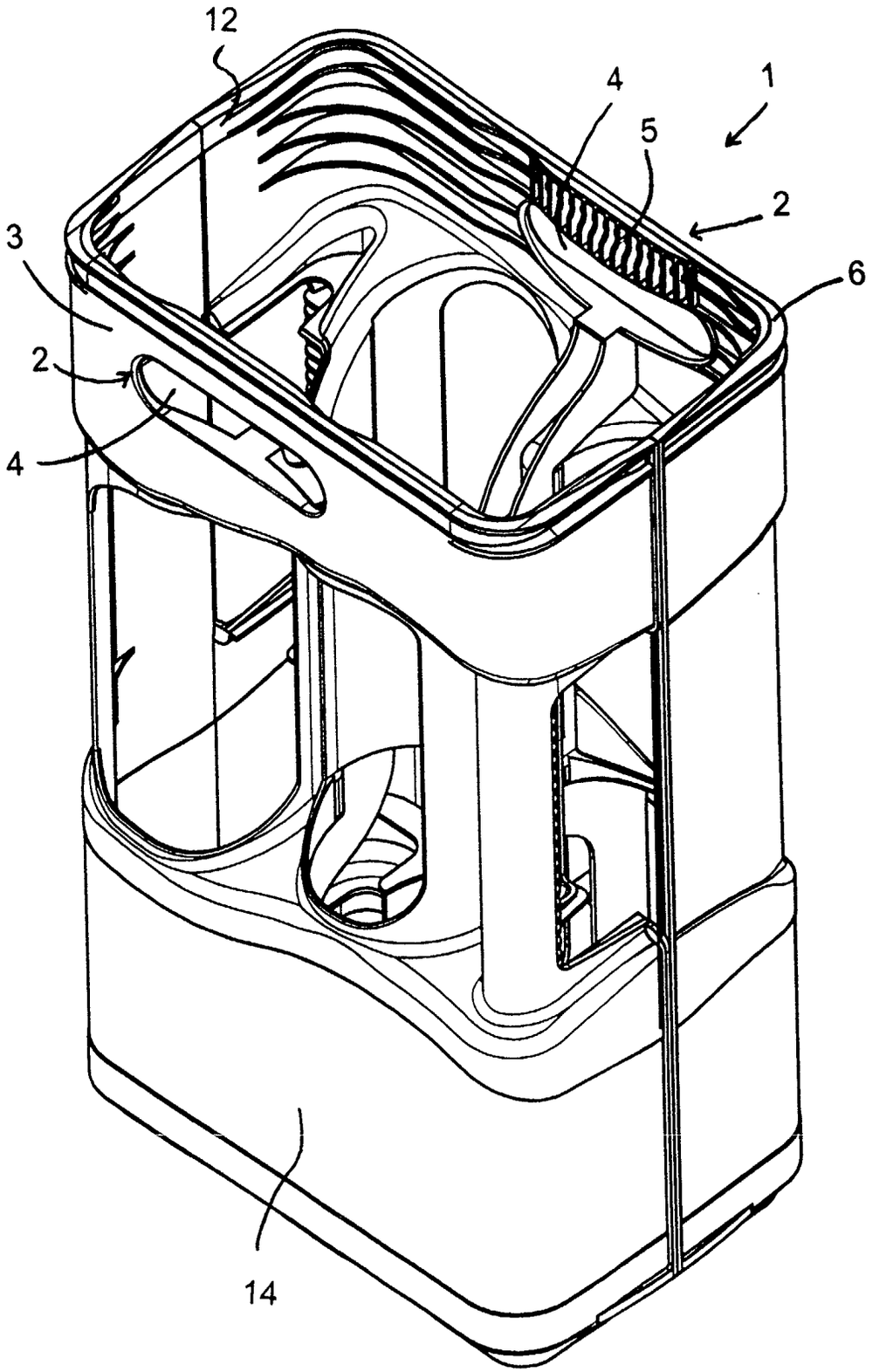
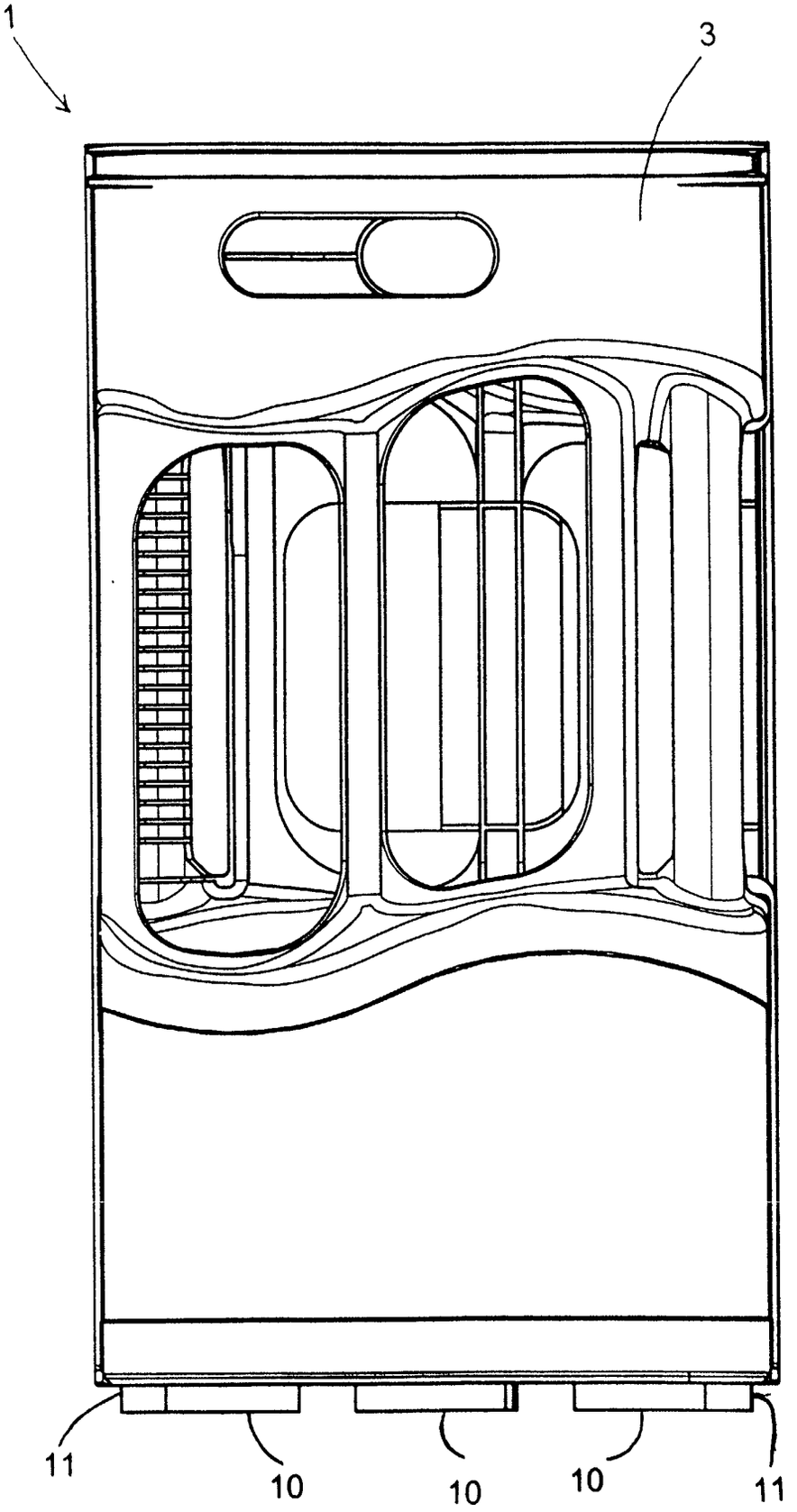


Fig. 2



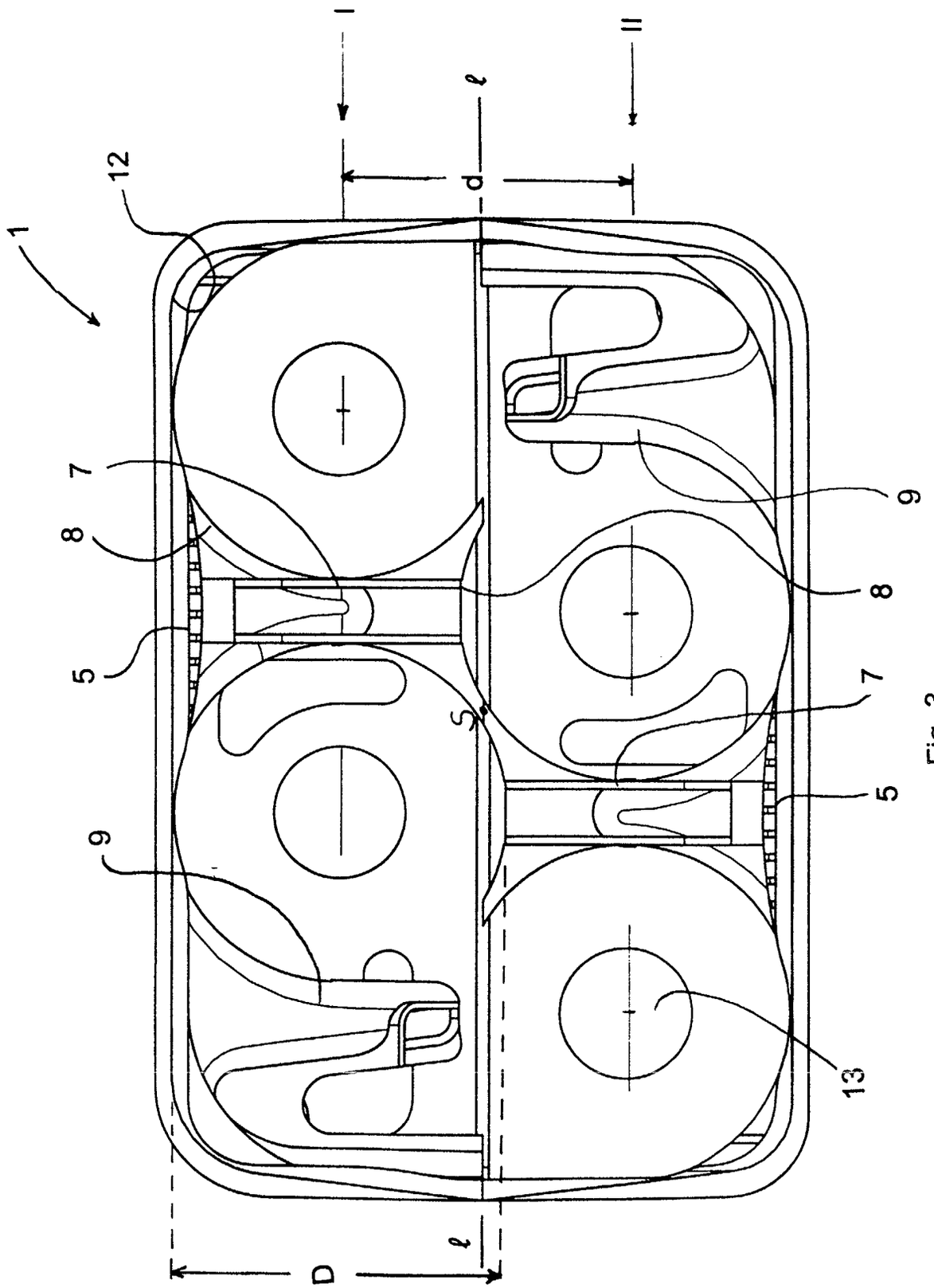


Fig. 3

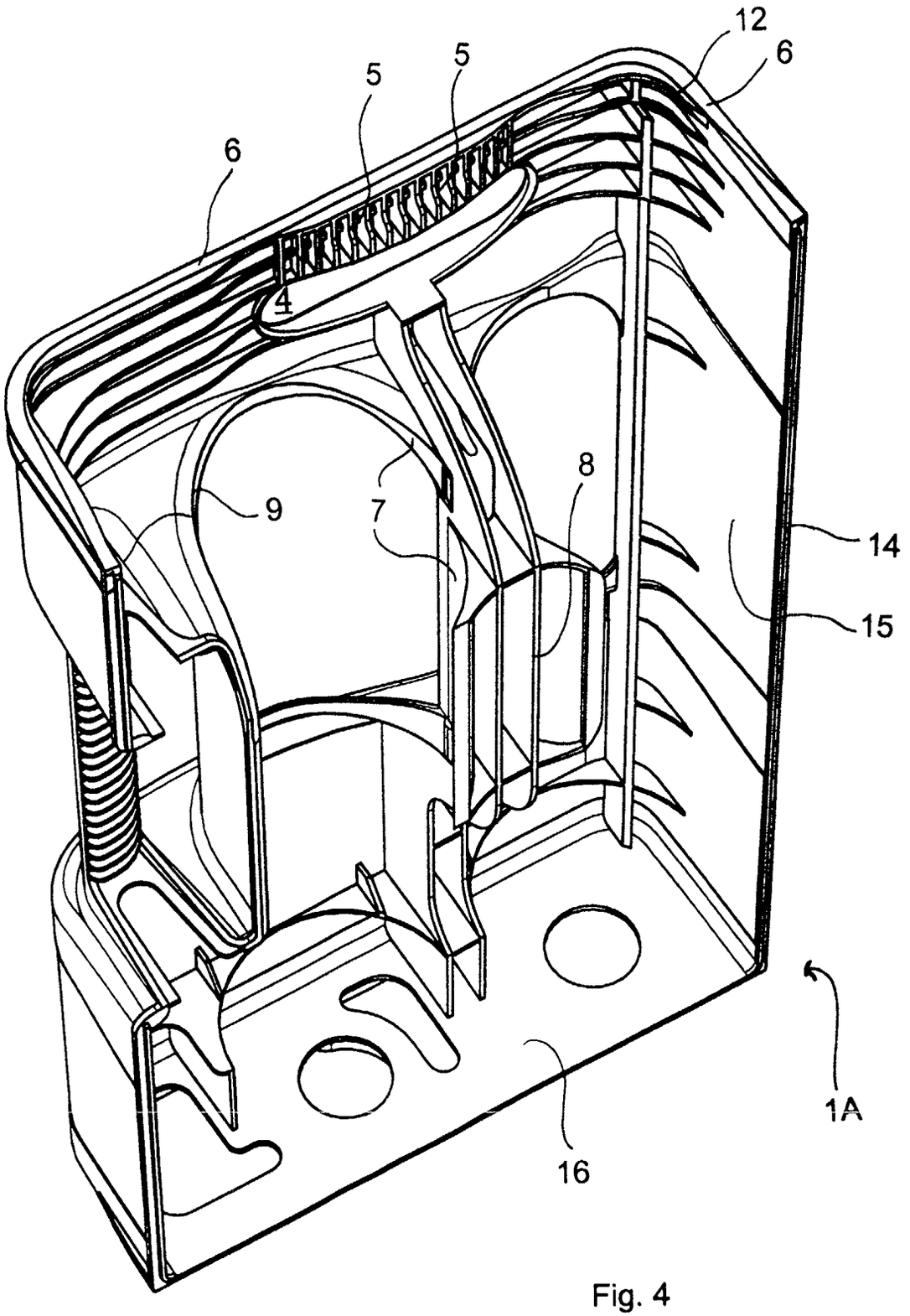


Fig. 4