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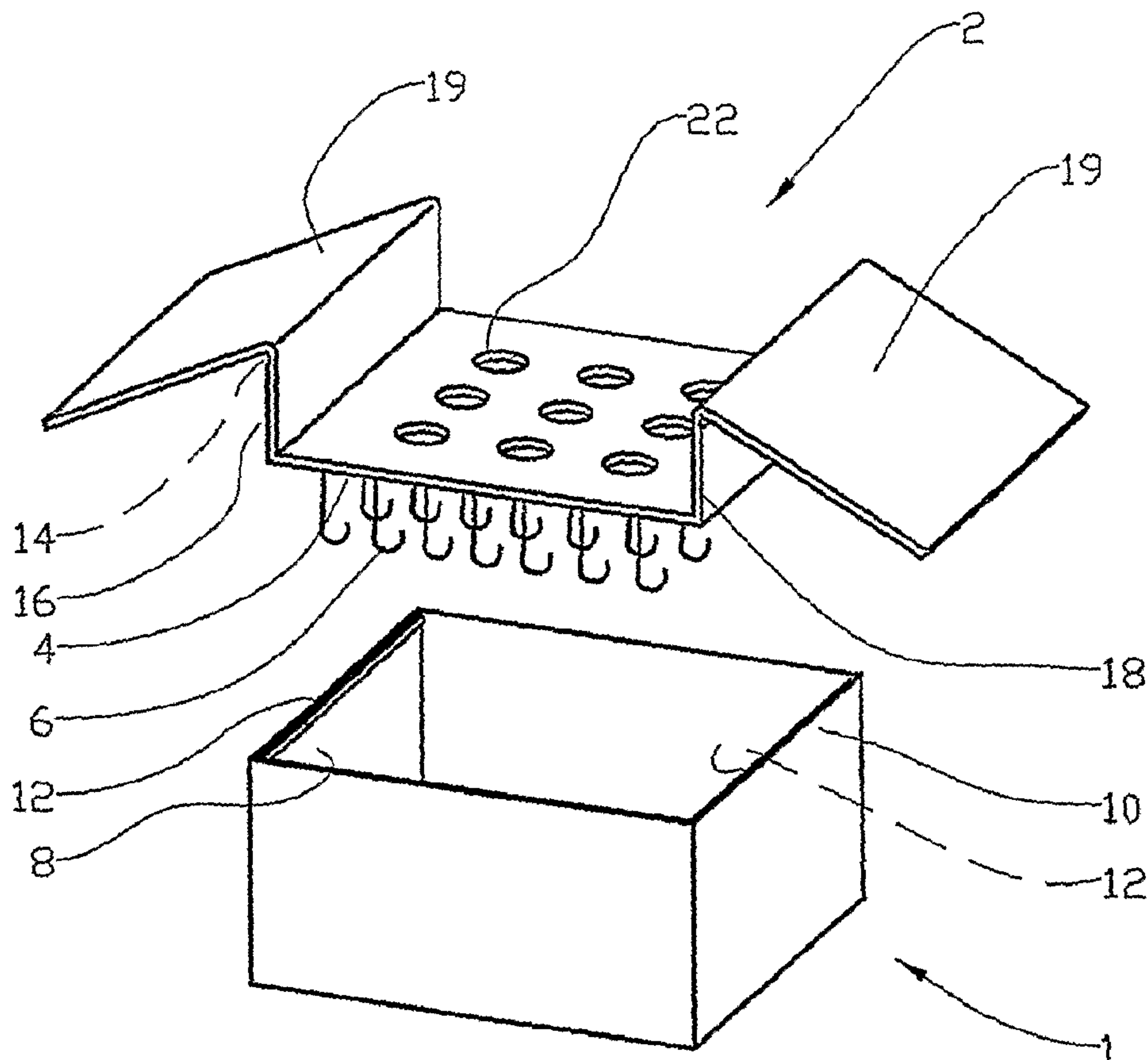
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(54) Title: ARRANGEMENT AND METHOD FOR A CASSETTE FOR PREPARATION OF BIOLOGICAL SPECIMENS



(57) Abrégé/Abstract:

A method and an arrangement for preparing a biological specimen (20), where the biological specimen (20), prior to being examined in e.g. a microscope, is dried, embedded in wax and optionally sliced, and where the biological specimen (20) is placed

(57) **Abrégé(suite)/Abstract(continued):**

in a container (1) with a lid/clamping member (2) that is closed, in which it is retained by a biasing element (6), the specimen (20) remaining in the same closed container/lid (1, 2) during the subsequent drying and embedment operations, whereupon the container (1) is removed from the lid (2) and the specimen (20) prior to any slicing operations.

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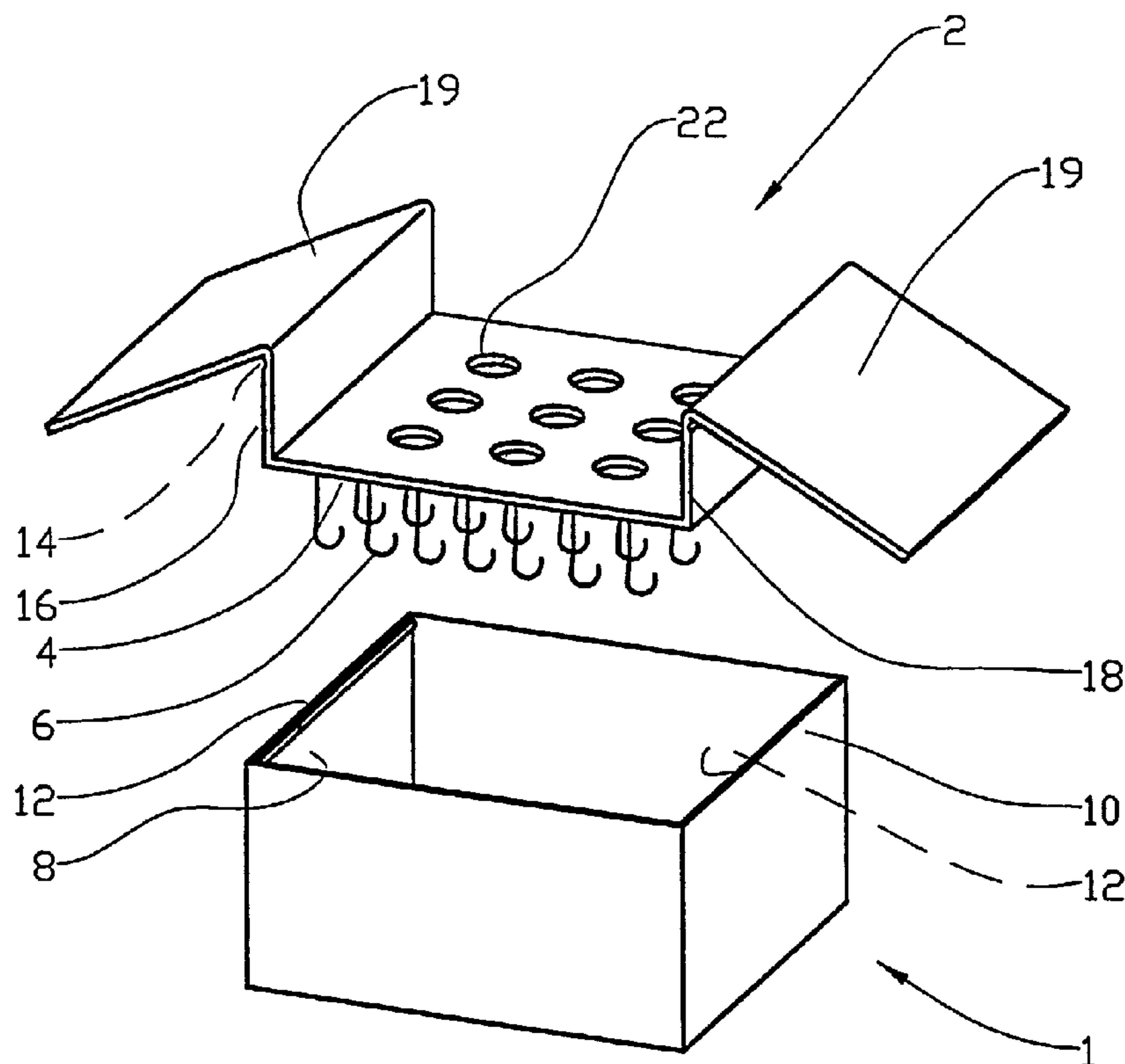
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(54) Title: ARRANGEMENT AND METHOD FOR A CASSETTE FOR PREPARATION OF BIOLOGICAL SPECIMENS



(57) Abstract: A method and an arrangement for preparing a biological specimen (20), where the biological specimen (20), prior to being examined in e.g. a microscope, is dried, embedded in wax and optionally sliced, and where the biological specimen (20) is placed in a container (1) with a lid/clamping member (2) that is closed, in which it is retained by a biasing element (6), the specimen (20) remaining in the same closed container/lid (1, 2) during the subsequent drying and embedment operations, whereupon the container (1) is removed from the lid (2) and the specimen (20) prior to any slicing operations.

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ARRANGEMENT AND METHOD FOR A CASSETTE FOR PREPARATION OF
BIOLOGICAL SPECIMENS

This invention regards a cassette (BioCassette) for use in
preparing biological specimens to be analysed in a
5 microscope. The cassette is compatible with known laboratory
equipment and allows the use of a simplified method that does
not subject the specimens to the relatively large number of
manipulations/repacking operations that comes with prior art.

It is customary for biological specimens that to a
10 substantial degree are taken from humans and animals, among
other things to be able to make a medical diagnosis for a
number of illnesses and diseases, to be prepared in order to
allow pathological examinations by use of microscope.

Obviously, it is important during this preparation process to
15 treat the specimens in accordance with procedures which
ensure that specimens are not exchanged, destroyed,
contaminated or lost, and that they retain their physical and
pathological properties.

Daily preparation of a large number of biological specimens involves a considerable cost for health institutions and patients.

According to prior art, one or more biological specimens,
5 hereunder designated the specimen, are first placed in one holder, which in turn is placed in a larger container containing formalin. After the specimen arrives at the laboratory, the preparation of the specimen starts by removing it from the formalin container and placing it on a
10 filter paper. The filter paper is folded around the specimen and placed with the specimen in a cassette adapted to the subsequent preparation operations. The cassette is closed and placed in a drying apparatus where the water in the specimen is driven out by means of solvents and pure alcohol in
15 combination with moderate heating and pressure fluctuations.

After drying, the cassette is opened, and the filter paper is removed and opened. The specimen is transferred from the filter paper to a mould in which it is placed at the bottom of the mould. Then it is fixed to the bottom of the mould by
20 a few drops of liquid paraffin wax. When the paraffin wax has solidified, the cassette is placed over the mould. The remaining mould volume and the cassette are filled with paraffin wax. When the paraffin wax has solidified, the mould is removed. With this, the specimen is set in a paraffin
25 moulding projecting down from the cassette.

The cassette is then mounted in a cutting machine/slicer where thin slices of wax and specimen are sliced from the downward face of the wax moulding.

Obviously, the preparation process according to prior art is time-consuming and requires that considerable care be taken in order to avoid any mix-up of the specimens. The many part operations are time-consuming and entail a great risk of
5 exchange, cross contamination, general contamination, physical destruction, loss of specimens and contamination of tissue.

The object of the invention is to remedy the disadvantages of prior art.

10 The object is achieved in accordance with the invention by the characteristics given in the description below and in the appended claims.

Upon sampling, the specimen is placed directly on the bottom of a container. The inside of the bottom may have a layer of
15 material with the same properties as those explained below in relation to the biasing material. In this invention, the term porous material refers to a material having open pores. A deformable, preferably flexible resilient biasing material is placed over the specimen. Advantageously, the biasing
20 material is connected to the downward facing side of a lid, where the lid is a complementary fit to the container. Hair-like bows, wool, foam or a spongy material are examples of biasing materials. Optionally, another form of pliant, resilient structure may be used. Preferably and for several
25 reasons - see below - the materials in contact with the specimen are porous and/or such that they do not impede the free flow of preparation fluid and wax.

The lid is pressed down into the container, where it is locked to the container with sufficient force, e.g. by use of a snap lock, the biasing material pressing the specimen against the bottom of the container so as to prevent the specimen from moving during the further processing. The container, the biasing material, the specimen and the lid are immediately placed in formalin for transport or temporary storage.

In a preferred embodiment, the lid is provided with plate-like, outwardly projecting portions that in addition to fitting as a holder in known slicers, are also suited for marking of the specimen, e.g. by means of bar codes.

When the specimen arrives at the laboratory, it may be placed in a feed/drying machine without intermediate re-packing, in which machine the moisture in the specimen is removed and where the last operation includes applying a thin layer of wax. After the drying is complete, the container receives an additional fill of liquid paraffin wax through the perforations in the lid. After the paraffin wax has solidified, the container may be removed. With this, the specimen is set in a wax moulding projecting down from the lid. The lid with the sample is then placed in a slicer that is known *per se*, and in which thin slices are cut from the underside of the wax moulding.

Thus when using the device of the invention, the specimen is placed directly in a container with a lid that may be marked in advance, and remains in the same packing until the specimen is cut into slices. It is obvious that the savings gained in preparation time and operations, together with the

increased safety against exchanges, contamination, destruction and loss of specimens, are highly favourable characteristics of the device. In this manner, the exposure of laboratory personnel to environmentally unfavourable substances is reduced, along with the requirements for special training.

The deformable materials that abut the specimen in a supporting manner must not impede the free flow of the fluids employed. By carrying out a modest modification or calibration of the processing machine, the container may be filled with a sufficient amount of wax to obviate the need for a subsequent fill-up of additional wax, such as described above. The following describes a non-limiting example of a preferred embodiment illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of a container and a lid having downwardly projecting spring bows;

Figure 2 is a section I-I through the container and the lid after a biological tissue sample has been placed in the container, but before the lid is pushed down into the container;

Figure 3 shows the section I-I after the lid has been pushed down into the container and the spring bows of the lid abut the tissue sample in a clamping manner;

Figure 4 shows the section I-I after the container and the lid have been filled with wax;

Figure 5 shows the section I-I after the container has been removed;

Figure 6 shows a section where the resilient element of the lid is constituted by a spongy material; and

5 Figure 7 shows a section through an alternative embodiment of the device according to the invention.

In the drawings, reference number 1 denotes a specimen container. A lid 2 designed to be pushed down into the specimen container 1 is provided with a biasing element 6 on
10 the perforated side 4 facing the specimen container 1, see figure 1. The biasing element 6 may as an example be in the form of hair-like springs, bows, spirals, wool, foam or a spongy porous material.

On the inside, along two of its opposite upper side edges 8
15 and 10, the specimen container 1 is equipped with inwardly projecting beads 12 that are designed to fit lockingly in two complementary grooves 14 in the vertical side faces 16 and 18 of the lid 2 upon the lid 2 being pushed into the specimen container 1, see figure 3. The lid 2 has at least one
20 outwardly projecting plate 19 well suited for marking of the specimen.

When taking a biological specimen 20, it is immediately placed in the specimen container 1, see figure 2. Then the lid 2, which may be marked in advance, is pushed down into
25 the specimen container 1 until the beads 12 of the container 1 correspond with and are pushed into the grooves 14 of the lid 2, see figure 3. The biasing element 6 of the lid abuts

the specimen 20 in a clamping manner, pressing it against the bottom of the specimen container 1.

After the specimen has been dried, the specimen container 1 and the lid 2 are filled with liquid wax 24, see figure 4.

5 The specimen container 1 is filled through the perforations 22 in the lid 2.

The specimen container 1 is removed after the wax 24 has solidified, see figure 5, whereby the specimen is ready to be sliced.

10 In an alternative embodiment, see figure 6, the resilient element may be constituted by a spongy porous body 26 designed to be filled with wax.

In a further alternative embodiment, see figure 7, the container 1 and the lid 2 are cylindrical and placed in a
15 separate holder 28, where the holder 28 serves as a holder in the slicer. A porous material 30, which may also be deformable, is arranged underneath the specimen 20.

CLAIMS

1. A biological specimen container, comprising:
 - a container body (1) having side walls, a bottom, and an inner bottom surface;
 - a container lid (2) having an inner lid surface (4); and
 - biasing means,characterized in that the biasing means comprises a plurality of flexible, compliant, and resilient biasing elements (6) which do not impede the free flow penetration of preparation fluid and wax.
2. A specimen container as claimed in claim 1, wherein the biasing elements are coupled to the inner lid surface of the container lid and configured to apply a retaining force to a biological specimen towards the inner bottom surface of the container body when the container lid is fitted to the container body.
3. A specimen container as claimed in any one of claims 1 or 2, wherein the biasing elements comprise hair-like springs.
4. A specimen container as claimed in claim 3, wherein the biasing elements are curled back in a hook shape.
5. A specimen container as claimed in any one claims 1 or 2, wherein the biasing means comprises hair-like bows, wool, synthetic fibres, foam or a spongy material.
6. A specimen container as claimed in any one of claims 1 to 5, further comprising a deformable porous material formed on the inner bottom surface of the container body.
7. A specimen container as claimed in any one of claims 1 to 6, wherein the container lid is perforated.
8. A specimen container as claimed in any one of claims 1 to 7, wherein the lid is lockable to the container.

9. A specimen container as claimed in any one of claims 1 to 8, wherein the lid is equipped with at least one outwardly projecting plate.
10. A method of preparing a biological specimen (20) for examination comprising placing the specimen in a container (1) as claimed in any one of claims 1 to 9 and closing the lid (2) thereon, characterized in that the biasing means (6) presses the specimen against the bottom of the container.
11. A method as claimed in claim 10, further comprising placing in formalin the container containing the specimen.
12. A method as claimed in claim 10 or claim 11, further comprising removing moisture from the specimen.
13. A method as claimed in any one of claims 10 to 12, further comprising applying to the specimen a thin layer of paraffin wax.
14. A method as claimed in any one of claims 10 to 13, further comprising setting the specimen in a wax moulding projecting down from the lid.

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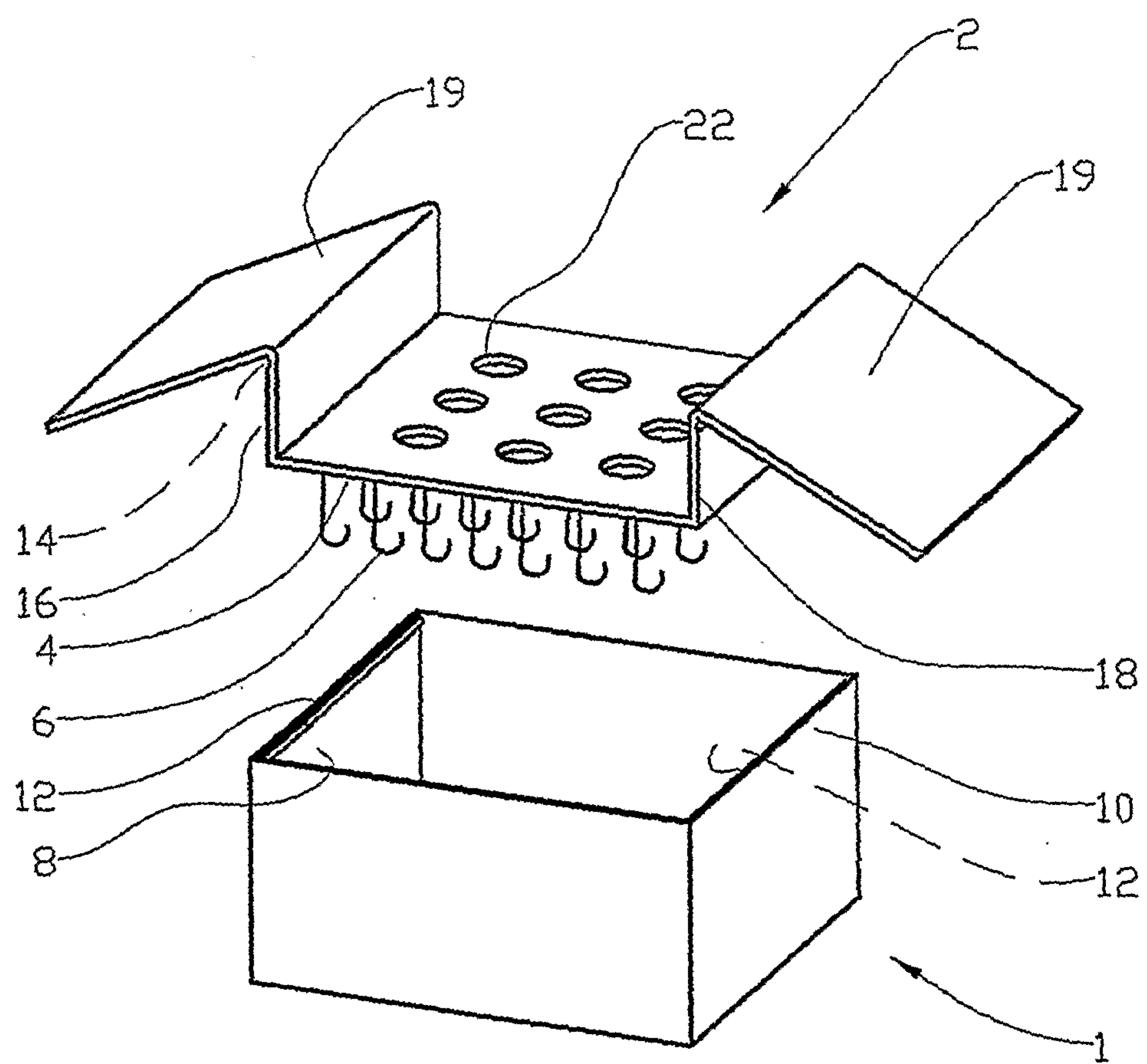


Fig. 1

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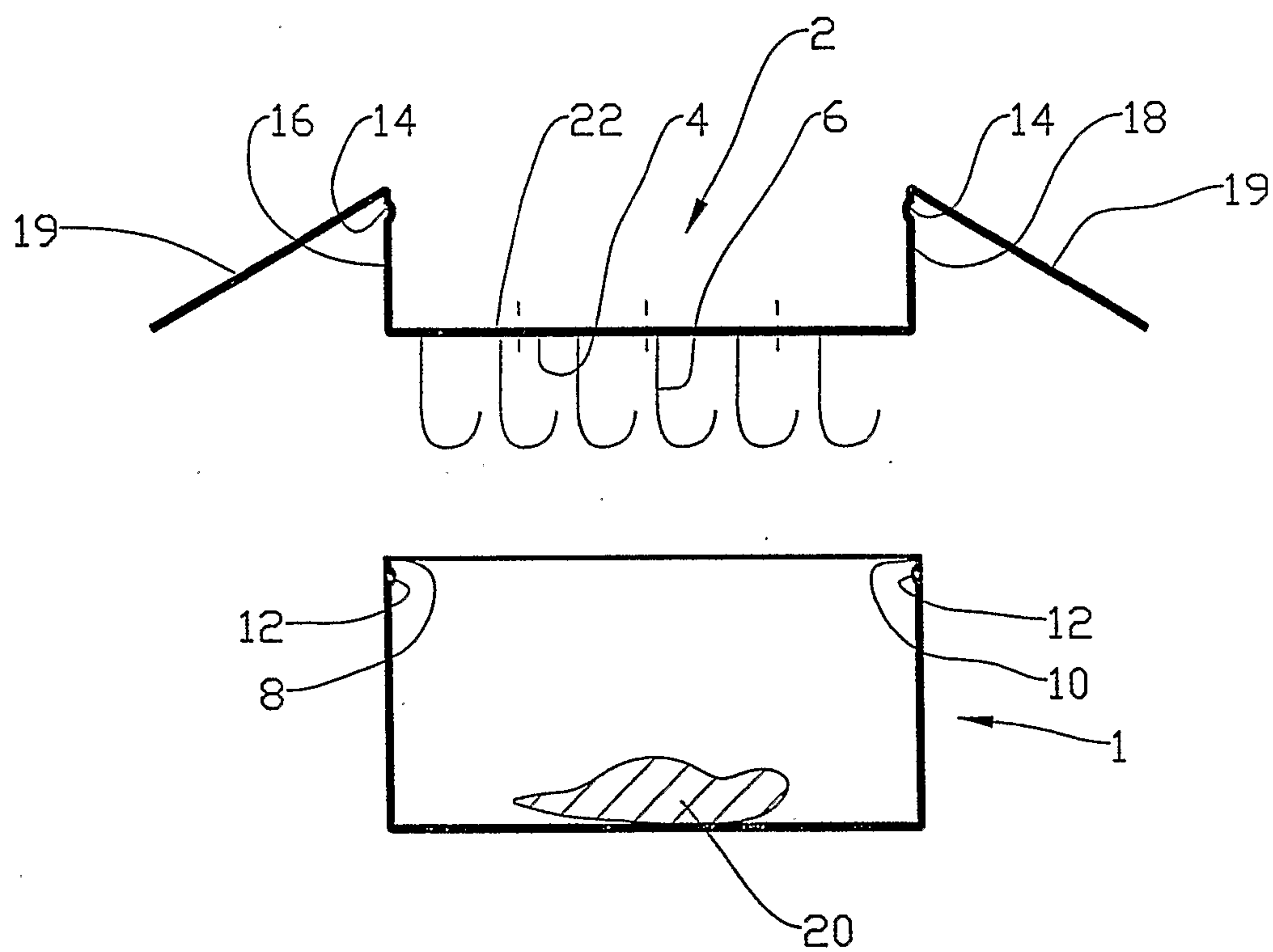


Fig. 2

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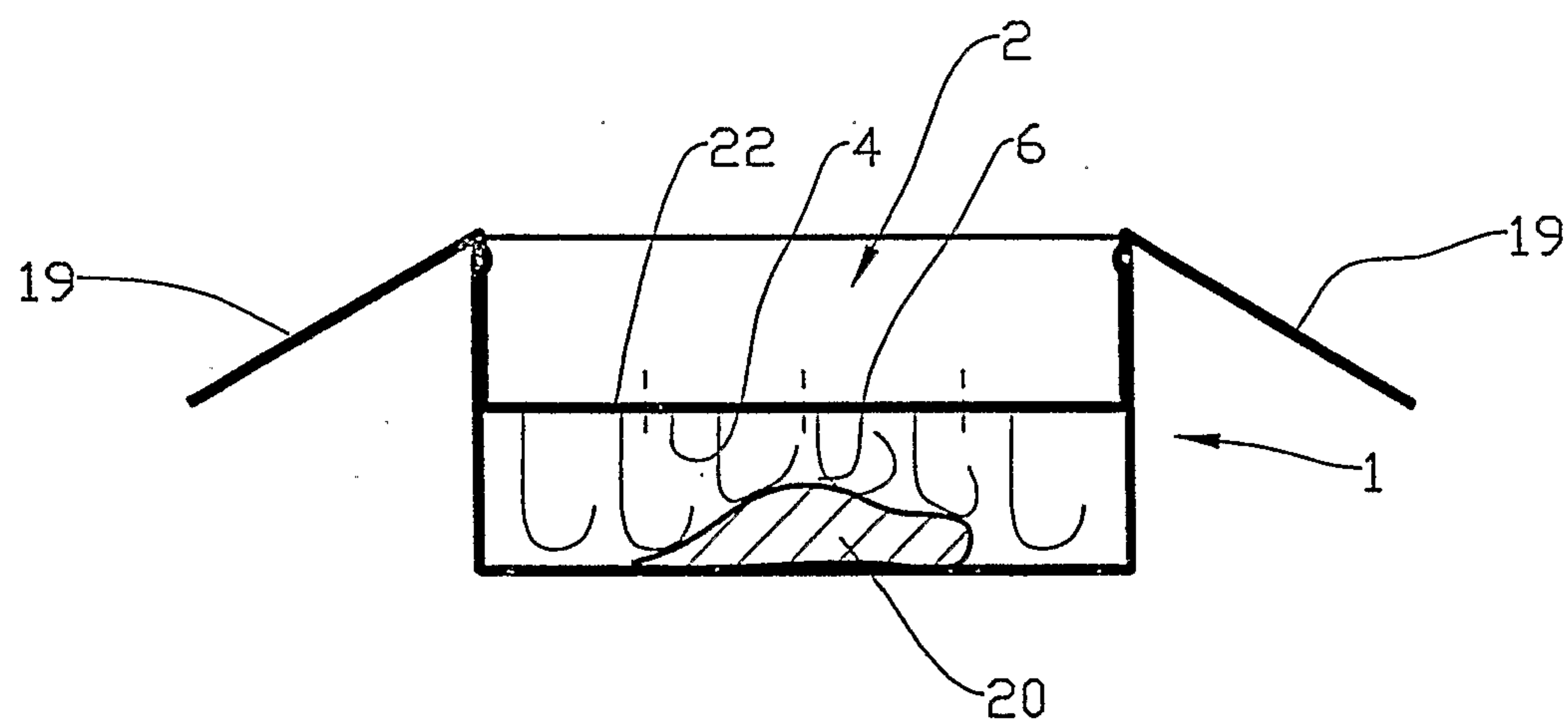


Fig. 3

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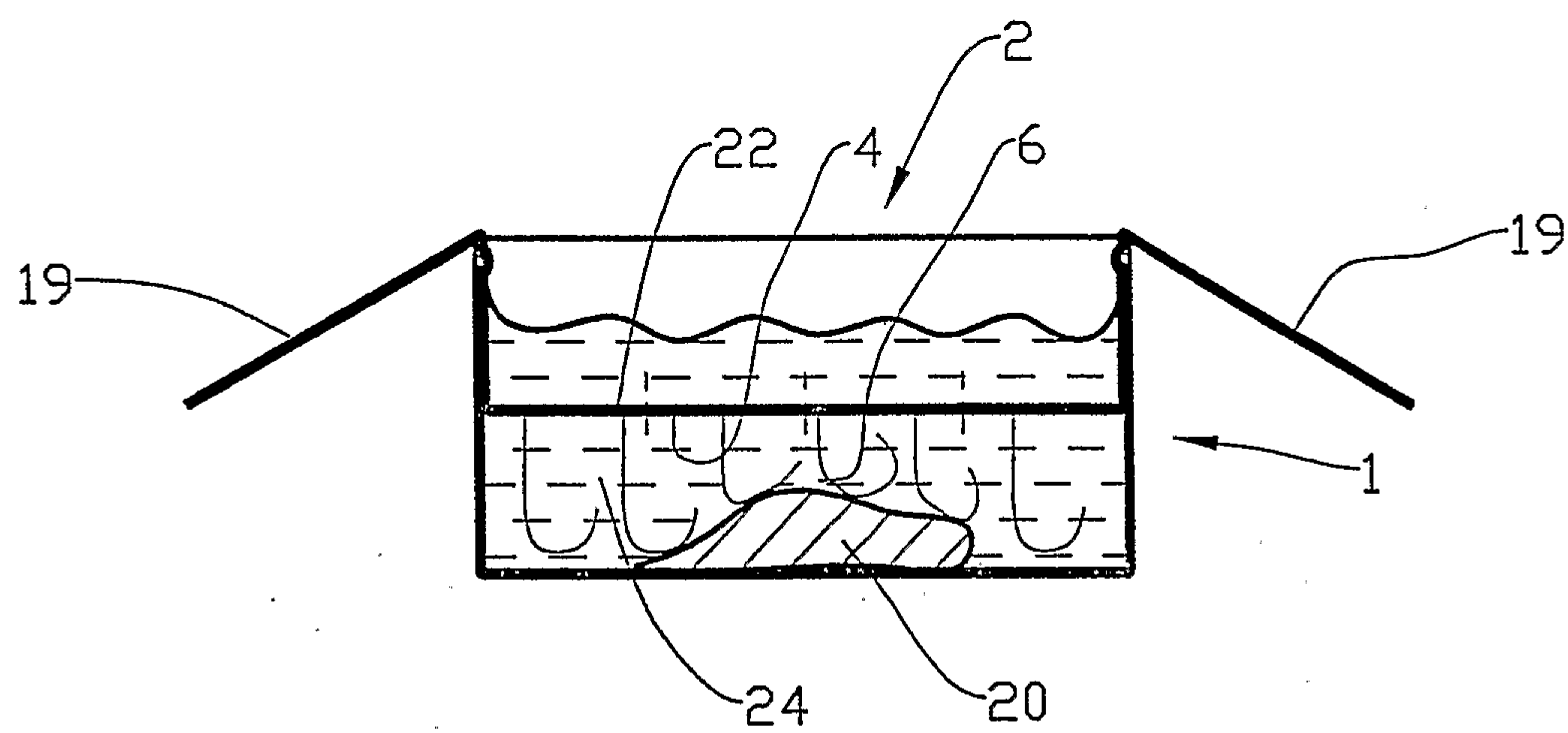


Fig. 4

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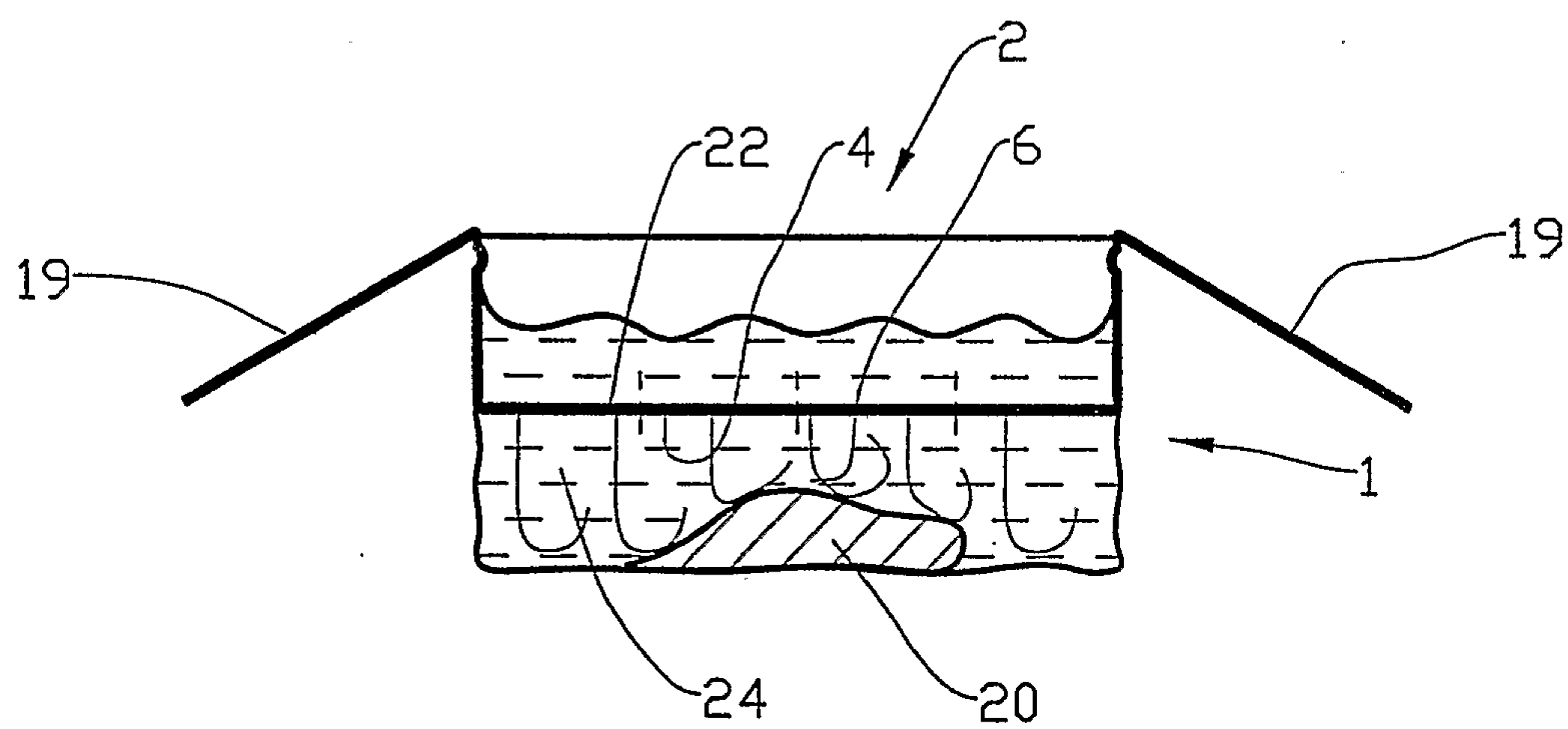


Fig. 5

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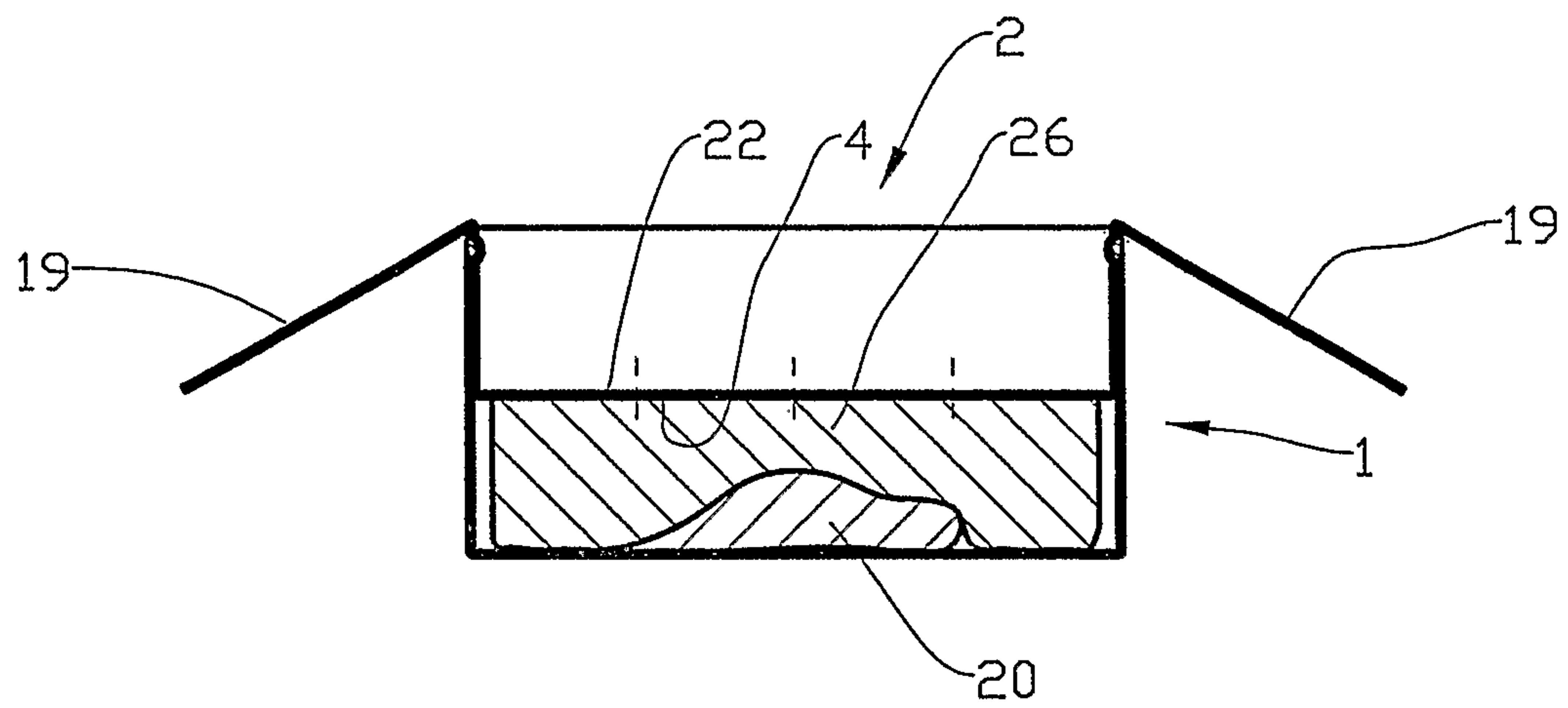


Fig. 6

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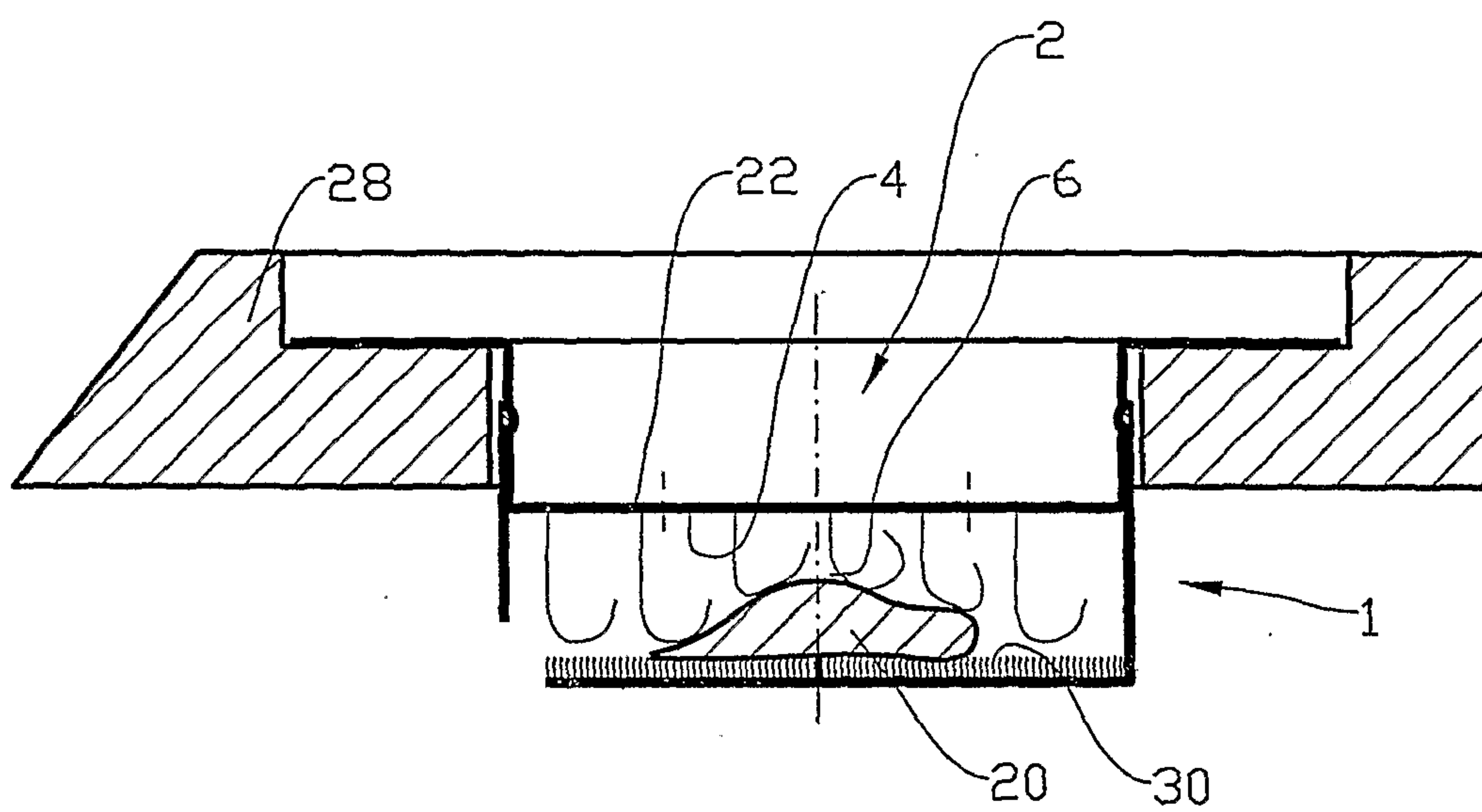


Fig. 7

