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(54) **Liquid-proof insert for domestic appliances and/or for plumbing inside cabinets**

(57) The invention relates to a liquid-proof insert (1) arranged for placement on the floor under a domestic appliance and/or a plumbing, and which, in the placed position, is effective to collect leaking liquid. The liquid-proof insert comprises a four-sided plate (2) of a liquid-tight material, preferably of polymer material, which in three sides has a raised border (3, 4, 5) and a fourth that forms the front side (6) of the liquid-proof insert. The liquid-proof insert is characterized in that a lip (13) connects to the front side, in the upperside of which lip two or more raised elevations (14) are formed and effective for pressing down of the lip, toward the floor. The lip is elongate and preferably runs along the front side of the liquid-proof insert, and the elevations extend substantially transverse to the longitudinal direction of the lip to a level above the same that forms a support plane (SP) for a skirting board supportable against the elevations.

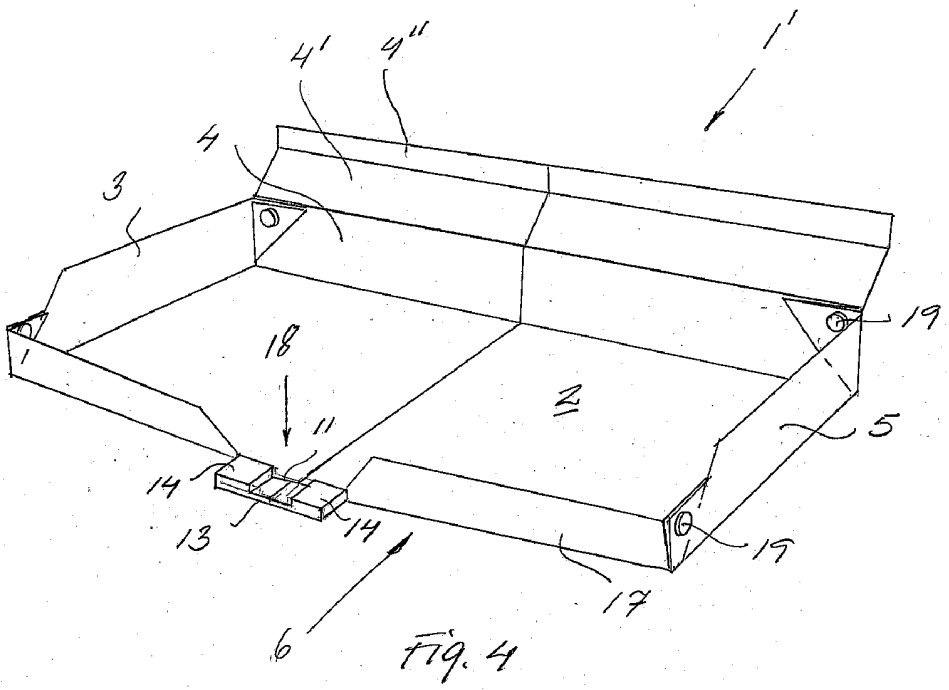

Fig. 4

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The invention relates to a device effective to prevent damage caused by leakage from so-called domestic appliances, such as dish washing and washing machines, tumbledriers, refrigerators and freezers and similar machines, and/or plumbing located inside cabinets, and which are supplied with water or contain or produce liquid during operation. More precisely, the invention relates to a liquid-proof insert impervious to liquid and of the type defined in the preamble of claim 1, as well as in addition the combination of a liquid-proof insert and a skirting board together with use of a skirting board to prevent sucking in of leakage liquid under the liquid-proof insert as a consequence of capillary forces acting between the liquid-proof insert and the floor.

BACKGROUND AND PRIOR ART

[0002] Liquid-proof inserts for the purpose intended here are previously known. Thus, as an example of a known liquid-proof insert, in SE-A-9303257, there is shown an impermeable insert intended to be placed under a domestic appliance to collect liquid in the event of a leakage of water or refrigerant. Known liquid-proof inserts may be arranged to convey the liquid forward for discharge in a front side of the insert and thereby, on one hand, prevent the emergence of damage due to damp in floors and joists under the domestic appliance, but also at an early stage to make visible the leakage to a user. Other previously known liquid-proof inserts are shown, for example, in SE-A-0103172 and SE-A-0201139.

[0003] A problem of known liquid-proof inserts is that liquid discharged in the front side of the insert risks being sucked in between the liquid-proof insert and the floor as a consequence of a capillary force acting in this area. In order to counteract drawing or sucking in of liquid, the front edge of the liquid-proof insert may be fixed against the floor by a double-stick tape. However, this fixation is not completely reliable because the weight imposed in certain points via the legs of the domestic appliance may cause a deformation of the insert, which results in the front edge thereof aiming to rise up from the floor. After some time of load, the tape risks losing the fixing effect thereof, resulting in a gap being formed between the floor/tape and the front edge of the liquid-proof insert. This represents a problem that furthermore, in modern standards of fittings with concealed mounted equipment, often grows worse by a terminating skirting board that in unfavourable cases is mounted tightly against the floor in front of the liquid-proof insert and shuts off the liquid flow in the event of a leakage.

THE INVENTION IN BRIEF

[0004] The invention aims at obviating this problem, and provides a liquid-proof insert that is arranged to enable mounting of a terminating skirting board without the signal function of the liquid-proof insert being affected.

[0005] The object is met by a liquid-proof insert formed in accordance with claim 1, while advantageous embodiments thereof are seen in the dependent claims.

[0006] In brief, by the invention, a liquid-proof insert is provided for placement on the floor under a domestic appliance and/or a plumbing, and which liquid-proof insert, in the placed position, is effective to collect leaking liquid, the liquid-proof insert comprising a four-sided plate of a liquid-tight material, which in three sides has a raised border and a fourth side forming the front side of the liquid-proof insert, which liquid-proof insert is characterized in that a lip connects to the front side, in the upperside of which lip two or more elevations are formed and effective for pressing down of the lip, toward the floor.

[0007] The lip is elongate and runs preferably along with the front side of the liquid-proof insert, and the elevations extend substantially transverse to the longitudinal direction of the lip.

[0008] The elevations extend considerably upward from the lip to a level above the same that forms a support plane for a skirting board supportable against the elevations.

[0009] It is preferred that the liquid-proof insert has formations in the upperside thereof that are effective to direct leakage liquid in a direction of flow toward an outlet situated in the front side of the liquid-proof insert, said outlet mouthing upstream of the lip and between two elevations situated next to each other. The outlet and the elevations may be situated in an intermediate area of the front side of the liquid-proof insert and of the lip, respectively.

[0010] The elevations extend advantageously angled to the longitudinal direction of the lip, in order to co-operatively delimit a flow path tapering in the flow direction and mouthing in a front edge of the lip. The outlet situated in the flow direction as seen upstream of the lip may be shaped to form a barrier in front of which the flow is dammed up before the liquid flows out along the flow path between the elevations.

[0011] The liquid-proof insert may advantageously be injection moulded of a polymer material, and the cross-section of the individual elevation may be given the shape of an inverted U.

[0012] By suitable choice of shape and dimension, the elevations may be given an inherent vertical stiffness so as to bias the lip, toward the floor. It will be appreciated that the proposed elevations may be distributed with a primarily uniform space within the entire length of the lip.

[0013] The lip of the liquid-proof insert is suitably manufactured with an excess width for adaptation upon mounting. The liquid-proof insert is suitably formed in one piece of polymer material, but may alternatively be made by joining different polymer materials. Suitable polymer materials are, for instance, polyethylene plastics and/or polypropylene plastics and/or polyethylene terepthalate

plastics. The liquid-proof insert may be manufactured by one or more of the production methods of injection moulding, vacuum forming, and punching.

[0014] In an additional aspect of the invention, the combination of a liquid-proof insert and a skirting board is provided, and in yet an additional aspect of the invention, use is provided of a skirting board for squeezing the front edge of a liquid-proof insert into sealing abutment against a floor and preventing sucking in of leakage liquid between the liquid-proof insert and the floor.

[0015] Additional advantageous embodiments of the invention are seen in the description and other dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The invention is described in detail below, reference being made to the accompanying schematic drawings, wherein

Fig. 1 is a plane view from above of an embodiment of a liquid-proof insert according to the invention;

Fig. 2 is a perspective view from the front of an outlet area in the front side of the liquid-proof insert;

Fig. 3 is a vertical cross-section in the flow direction through the outlet area, and

Fig. 4 is a perspective view showing a second embodiment of the invention.

DETAILED DESCRIPTION OF EMBODIMENT EXAMPLES

[0017] With reference to Figs. 1-3, a liquid-proof insert 1 is shown to be arranged for placement on the floor under a domestic appliance and is, in the placed position, effective to collect liquid in the event of leakage from the domestic appliance. The liquid-proof insert 1 is in the form of a plate 2 having four sides. Three of these sides have raised borders 3, 4 and 5, while a fourth side 6, which forms the front side of the liquid-proof insert, may lack such a raised border. The liquid-proof insert 1 is typically rectangular in a planar view. The reference numeral 7 designates a flap, which foldably connects to an upper edge of the border 4 in the back side of the liquid-proof insert. The liquid-proof insert 1 is manufactured from a material impervious to liquid, in particular a synthetic material, and may suitably be injection-moulded of a polymer material suited for the purpose. Formations, in the form of ridges 8, 9 raised from the upperside of the liquid-proof insert, are in that connection preferably arranged to direct leakage liquid in a flow direction toward an outlet 10 in the front side of the liquid-proof insert. Similar formations may be formed in the upperside of the flap 7 to convey liquid over the border 4 to the upperside of the liquid-proof insert. For the placement of the legs/feet of the domestic appliance on the liquid-proof insert, the corner areas of the liquid-proof insert lack the above-mentioned formations. The liquid-proof insert 1 is suitably dimensioned to conform to standardized coordinating sizes of fittings for kitchen, bathrooms and washrooms, and has typically the measure of about 60 x 60 cm with borders of a height of 5-15 cm. The ridges 8, 9 may have a height of some millimetres to some few centimetres.

[0018] The outlet 10 is advantageously, but not necessarily, situated in an intermediate area of the front side of the liquid-proof insert. In the outlet 10, a barrier 11 is formed, which extends transversely to the flow direction P of outflowing leakage liquid. The barrier 11 are effective for temporary damming of the liquid flow, and prevents that smaller leakage volumes remain undiscovered as a consequence of the tendency of the liquid to follow surfaces of the liquid-proof insert. By temporary damming of a liquid volume, a visible signal is guaranteed when a sufficient amount of liquid has been dammed up so as to flow over the barrier 11. The barrier 11 may be formed as a lower portion in the opening 10 by a ridge 12, which delimits the front side 6 of the liquid-proof insert.

[0019] Toward the front side 6 of the liquid-proof insert, a lip 13 connects. The lip 13 extends in a longitudinal direction along the front side 6, and advantageously with uniform width along a part or along the entire length of the front side 6. The lip 13 has such a thickness that the upperside thereof is on a lower level than the upperside of the barrier 11. On both sides of the outlet 10, a respective elevation 14 is arranged to protrude from the upperside of the lip. At least two elevations 14 extend in this way generally transverse to the longitudinal direction of the lip in order to delimit a flow path 15 of liquid that flows out via the outlet 10. The elevations 14 may advantageously extend angled to delimit a flow path 15 tapering in the flow direction and mouthing in a front edge of the lip. A greater number of elevations may, where appropriate, be arranged with a uniform space within the entire length of the lip for distribution of pressure in the longitudinal direction of the lip. In an alternative design of the elevations 14, the same may have a greater extension in the longitudinal direction of the lip than in the transverse direction thereof, wherein one or more flow paths 15 may be in the form of a ditch, the bottom of which is situated on the level of the lip 13.

[0020] For reasons detailed below, it is preferred that the elevations 14 have a height over the lip 13 that exceeds the height of the ridge 12 in the front side of the liquid-proof insert. The elevations 14 are effective for holding down or pressing down the lip 13 toward the floor. For this purpose, the elevations 14 may be formed as solid or hollow elevations of sufficient vertical stiffness to be able to prevent the lip from "rising" from the floor as a consequence of the point-wise load from the domestic appliance or cabinet body resting on top of the same. The elevations 14 may have the cross-section shape of an inverted U-iron, such as illustrated in the embodiment example. In particular, it is taught that the elevations 14

extend upward from the lip to a level above the same that forms a support plane SP (see Fig. 3) for a skirting board S supportable against the elevations 14, such as illustrated in Fig. 3 by a dash-dotted line. For this reason, it is preferred that the elevations 14 extend to a level that prevents capillary effects from arising between the lower edge of skirting board and the upperside of the lip, and therefore the elevations have at least a height h that is above the limit of the effect of capillary forces. The elevations 14 may extend to a level that is below the height of the ridge 12, but suitably extend to a level that is above the same, whereby it is guaranteed that a retrofitted skirting board rests on the elevations 14 so as to press down the lip into abutment against the floor. However, the invention is not dependent on the fact that the elevations, such as illustrated in Fig. 3, should extend over the height of the ridge 12, which, like a border 17 described below of an alternative embodiment, forms a barrier transverse to the flow direction of leakage liquid, having the function to direct and force the flow of the liquid toward an outlet formed in the barrier. However, it is important that the elevations 14 have a height that guarantees a water passage under a skirting board resting on the elevations.

[0021] With reference to Fig. 4, the invention is shown realised as a foldable liquid-proof insert 1'. Like the preceding embodiment example, this comprises a plate 2 having four sides. Three of said sides have raised borders 3, 4 and 5, while a fourth side 6, which forms the front side of the liquid-proof insert, has a border 17 having an outlet 18 formed in an intermediate portion of the front side 6. The liquid-proof insert 1' is made of a flexible plastic material and is foldable in one or several steps along longitudinal and transverse folding lines not mentioned in detail, for the formation of a flat parcel, so as to enable simple transportation and storage. A foldable extension 4' of the border 4 of the back side allows adaptation of the liquid-proof insert to domestic appliances/bottom cabinets of different depth measures upon mounting. In the free edge thereof, the extension of the rear border 4' may suitably have a strip 4" that is foldably connected with the extension 4' and can be fixed against a wall being behind or the like by means of an approved putty/jointing paste or tape. Thereby, it is guaranteed that liquid running down along the wall is directed inward on the liquid-proof insert. Fastening members 19 fix the liquid-proof insert in an upturned position by connection of corner flaps of meeting borders in the corners of the liquid-proof insert. The fastening members 19 may be in the form of dismountable and reusable rivets, whereby it becomes possible to open the front corner joints for lowering of the front border 17 upon mounting or upon replacement of a domestic appliance.

[0022] From the outlet 18 in the front side of the liquid-proof insert, a lip 13 projects, in the upperside of which elevations 14 are formed substantially in a corresponding way as has been described above, and more precisely to a level above the same that forms a support plane SP for a skirting board supportable against the elevations 14. The lip 13 may suitably be made to have an excess measure for fitting to a depth measure between an existing wall and the front edge of a mounted skirting board. The elevations 14 extend generally transverse to the longitudinal direction of the lip and delimit a flow path 15 for liquid flowing out via the outlet 18 in the front border 17. For the sake of completeness, it should be mentioned that the liquid-proof insert 1', in the shown embodiment example, is dimensioned for mounting under one or two domestic appliances, or cabinets resting on legs, disposed beside each other.

[0023] In both examples, the elevations 14 may be made as homogeneous or hollow members. In other embodiments, not shown, the elevations 14 may have an elongate shape in the longitudinal direction of the lip, and alternatively be formed to extend along the entire or substantially the entire length of the lip 13, in order to, in one or more locations, be broken through by grooves or ditches forming or more flow paths 15 for leakage liquid. In an additional embodiment, the elevations 14 may be united to the border 17 or the ridge 12, and the ridge 12 may alternatively be integrated in the elevations 14, which in this embodiment by themselves form a barrier damming and directing leakage liquid toward the flow path or paths 15.

[0024] A liquid-proof insert according to the invention is suitably manufactured in one piece of a polymer material or of a copolymer, and may also be composed of different types of polymer materials. Suitable materials are, for instance, polyethylene (PE) and/or polypropylene (PP), and/or polyethylene terepthalate (PET), which should not exclude use of other plastics suitable for the processes of manufacture such as injection moulding, punching, vacuum forming. The forming of the liquid-proof insert suitably comprises that the lip 13 in the front side of the liquid-proof insert is manufactured with an excess width in order to, upon mounting, be adapted to the depth measure of the domestic appliance or cabinet body, so that the lip is terminated substantially in flush with or in adaptation to the front edge of a mounted skirting board. Such adaptation is suitably carried out using a hand tool such as knife or scissors. Hole making for pipe lead-throughs may be made using the same tool or by means of a hole drill, after which the periphery of the pipe is sealed against the liquid-proof insert by means of an approved putty/jointing paste, or tape.

[0025] By the invention, there are guaranteed, on one hand, the shape stability of the liquid-proof insert and a sealing abutment that prevents liquid from being sucked in by capillary effects between the floor and liquid-proof insert. The seal may, where appropriate, in a conventional way be supplemented with a double-stick tape that is applied under the lip 13, alternatively thin ribs (not shown) may be formed in the underside of the lip and arranged to be pressed to seal against the floor. On the other hand, a distinct signalling of an occurred leakage is guaranteed also in case a retrofitted skirting board is applied in front of the liquid-proof insert 1, by the fact that the elevations

14 carry the skirting board and prevent an application of the same that shuts off outflow of liquid from the liquid-proof insert.

Claims

1. Liquid-proof insert for placement on the floor under a domestic appliance and/or a plumbing, and which liquid-proof insert, in the placed position, is effective to collect leaking liquid, the liquid-proof insert comprising a four-sided plate of a liquid-tight material, which in three sides has a raised border and a fourth side forming the front side (6) of the liquid-proof insert, which liquid-proof insert is **characterized in that** a lip (13) connects to the front side (6), in the upperside of which lip two or a more elevations (14) are formed, which elevations have vertical stiffness for pressing down of the lip toward the floor.

2. Liquid-proof insert according to claim 1, **characterized in that** the elevations (14) extend upward from the lip (13) to a level above the same that forms a support plane (SP) for a skirting board supportable against the elevations (14).

3. Liquid-proof insert according to claim 1 or 2, **characterized in that** the lip (13) is elongate and runs along the front side of the liquid-proof insert, and the elevations (14) extend substantially transverse to the longitudinal direction of the lip.

4. Liquid-proof insert according to any one of claims 1-3, **characterized by** having formations (8, 9) in the upperside thereof that are effective to direct leakage liquid in a flow direction (P) toward an outlet (10) situated in the front side of the liquid-proof insert, and by said outlet mouthing upstream of the lip (13) and between two elevations (14) situated next to each other.

5. Liquid-proof insert according to any one of claims 1-3, **characterized by** having a raised border (17) in the front side thereof that is effective to direct leakage liquid in a flow direction (P) toward an outlet (18) situated in the front side of the liquid-proof insert, and by said outlet mouthing between two elevations (14) situated next to each other.

6. Liquid-proof insert according to any one of claims 1-5, **characterized in that** said outlet (10; 18) and elevations (14) are situated in an intermediate area of the liquid-proof insert and the lip, respectively.

7. Liquid-proof insert according to any one of claims 1-6, **characterized in that** the elevations (14) extend angled to the longitudinal direction of the lip, and between themselves delimit a flow path (15) tapering in the flow direction and mouthing in a front edge of the lip (13).

8. Liquid-proof insert according to any one of claims 4-7, **characterized in that** the outlet (10; 18), situated upstream of the lip in the flow direction of the leakage liquid, forms a barrier (11) in front of which the flow is dammed up before the liquid flows along the flow path (15) between the elevations (14).

9. Liquid-proof insert according to any one of the preceding claims, **characterized in that** the elevations have an inherent vertical stiffness so as to bias the lip, toward the floor.

10. Liquid-proof insert according to any one of the preceding claims, **characterized in that** the cross-section of the individual elevation (14) has the shape of an inverted U.

11. Liquid-proof insert according to any one of the preceding claims, **characterized in that** the elevations (14) have a homogeneous cross-section.

12. Liquid-proof insert according to any one of the preceding claims, **characterized in that** elevations (14) are distributed with a primarily uniform space within the entire length of the lip.

13. Liquid-proof insert according to any one of the preceding claims, **characterized in that** elevations (14) are formed to extend along the entire or substantially the entire length of the lip (13) and are broken through by one or more flow paths (15) in the form of ditches or grooves.

14. Liquid-proof insert according to any one of the preceding claims, **characterized in that** the lip (13) is manufactured with an excess width for adaptation upon mounting.

15. Liquid-proof insert according to any one of the preceding claims, **characterized in that** the same is manufactured from polymer material.

16. Liquid-proof insert according to claim 15, **characterized in that** the same is combined of different polymer materials.

17. Liquid-proof insert according to claim 15 or 16, **characterized in that** the same is manufactured from at least one of polyethylene plastics (PE), polypropylene plastics (PP) and polyethylene terepthalate plastics (PET).

18. Liquid-proof insert according to any one of claims 15-17, **characterized in that** the same is manufactured by one or more of the production methods of

injection moulding, vacuum forming, and punching.

19. Liquid-proof insert according to any one of claims 5-18, **characterized by** having longitudinal and transverse folding lines by means of which the same is foldable for the formation of a flat parcel.

20. Liquid-proof insert according to claim 19, **characterized in that** the same, in the back side thereof, has a strip (4") that is foldably connected to a raised border (4, 4') and by means of putty, jointing paste or tape is attachable to a wall being behind upon mounting of the liquid-proof insert.

21. Liquid-proof insert according to claim 19, **characterized in that** the same has borders (2, 3) that connect to a raised and foldable border (17) in a front edge and are raised from the side edges of the liquid-proof insert, which in corner joints are detachably connected to the front border.

22. Liquid-proof insert according to claim 21, **characterized in that** the corner joints are detachably fixed by means of dismountable and preferably reusable fastening members (19), preferably in the form of dismountable rivets.

23. Liquid-proof insert co-operating with a skirting board (15), which liquid-proof insert is arranged for placement on the floor under a domestic appliance and/or a plumbing, and, in the placed position, is effective to collect leaking liquid, the liquid-proof insert comprising a four-sided plate of a liquid-tight material, which plate in three sides has a raised border and a fourth side forming the front side (6) of the liquid-proof insert, which combination is **characterized in that** a lip (13) connects to the front side (6) of the liquid-proof insert, in the upperside of which lip two or more elevations (14) are formed to extend upward from the lip (13) to a level above the same that forms a support plane for the skirting board (S) resting against the elevations (14).

24. Use of a skirting board (15) for pressing down a lip (13) formed in the front edge of a liquid-proof insert (1) into abutment against a floor, wherein two or more elevations (14) project from the upperside of the lip (13) to a level above the lip (13) that forms a support plane for the skirting board (S) resting against the elevations (14).

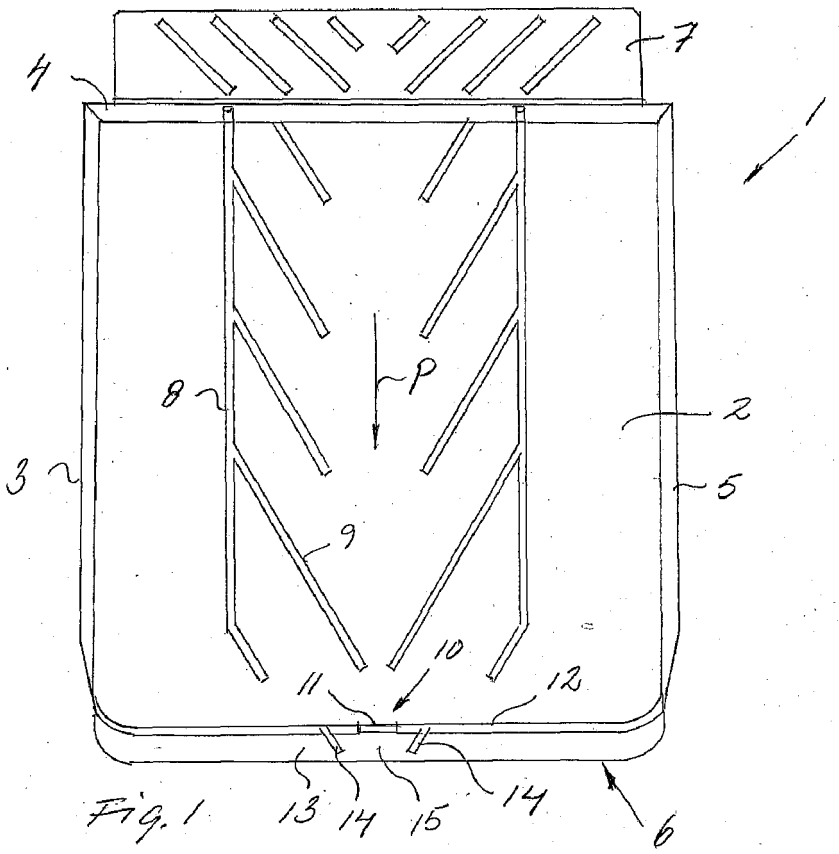

Fig. 1

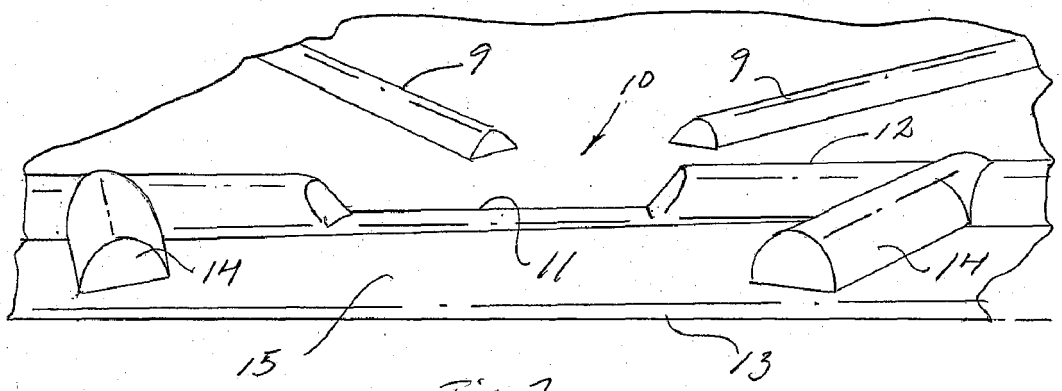

Fig. 2

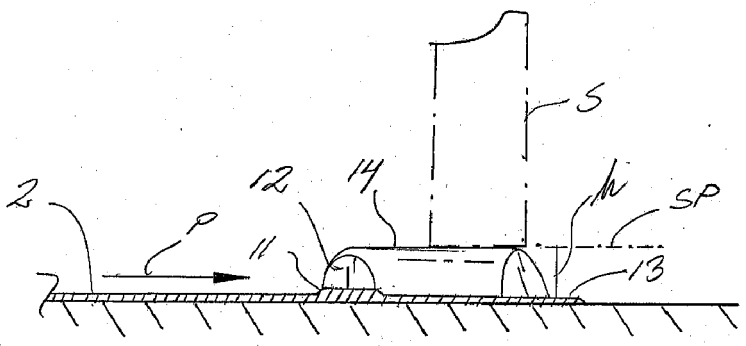

Fig. 3

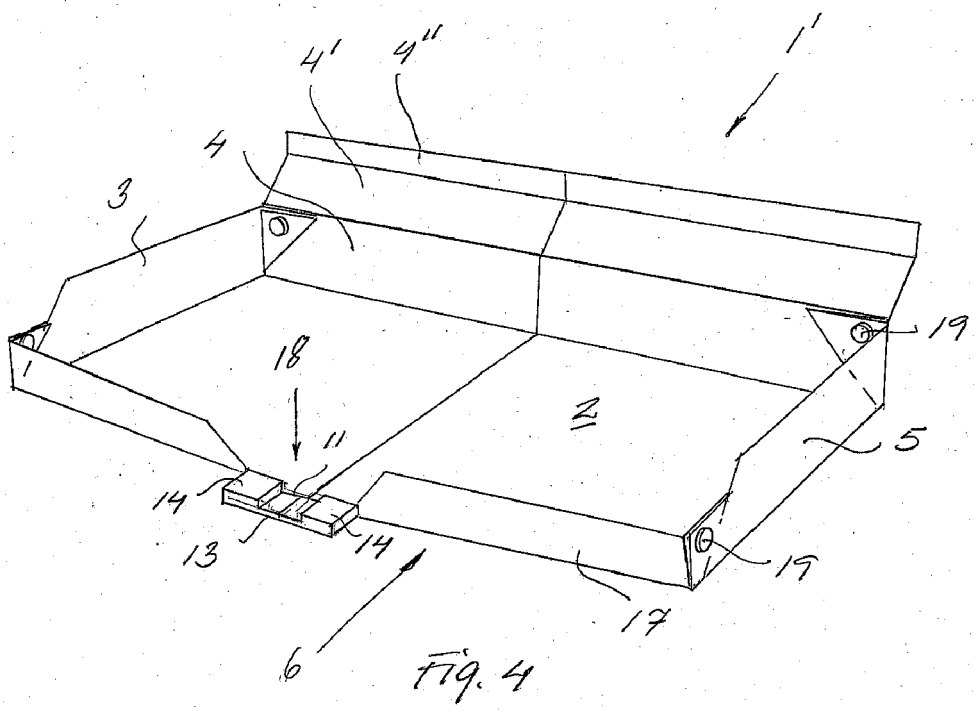

Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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