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A GUARD FOR A BOVINE ANIMAL'S TAIL

The present invention relates to guards for bovine animal tails and in particular to guards for use on a raised bedding area with an adjacent walking area onto which animal waste is deposited.

In modern milking systems, dairy cows are wintered indoors in what is commonly known as a loose housing system. In some countries, the modern intensive trend in dairy farming is for all year housing. The loose housing system requires the use of bedding cubicles for the cows to lie down on. Defecation and urination generally take place in the walking area of the housing. The walking area consists of a floor which generally comprises either a slatted floor including a series of slats allowing the waste to drop down into a collection pit underneath the floor, or the floor consists of a solid concrete floor which is mechanically scraped to remove the waste. Even if the floor is the slatted floor type, the surfaces of the slats themselves are practically always covered with a faecal slurry of animal faeces and urine. Thus in either case, the floor is always considerably soiled, especially in the area directly below the raised bed cubicle.

The trend is that most cubicles today are fitted with cow mats or cow mattresses (referred to hereafter as "mats") and cubicle hygiene is critically important because when a cow is lying down, her udder and teats are in contact with the mat. Extremely high standards of milk quality is demanded from dairy farmers to safeguard public health. Significant financial penalties are imposed if a milk test shows levels of bacteria resulting from faecal contamination in the milk. When standing or lying in the cubicle, a cow will defecate and it is important that the cow dung is naturally expelled into the walking area, not in the cubicle bedding area itself. Modern cubicles are designed to facilitate this by restricting the cow from lying far forward in the cubicle; ideally the anus should be above or over the edge of the cubicle so that faeces and urine will flow into the walking area.

This situation presents a problem because the nearer an animal's rear is to the edge of the cubicle bedding area, the more likely it is that the animal's tail will be resting in the faecal slurry on the soiled walkway. This obviously means that the cow's tail ends up covered

and matted with faecal matter. Over time, this matter becomes dried in and entangled with the tail. This is not only uncomfortable for the cow but also for the dairy farmer because as he is milking the cows in a milking shed in which the farmer stands in a pit with the cows standing in raised milking stalls, the farmer can often be struck by a cow's swinging
5 tail swung by a cow as he stands close to the cow during the milking process. Being struck by a dirty tail is both unpleasant and unhygienic for the farmer. As well as that, there may be transfer of faecal matter from the soiled tail onto equipment in the milking shed. This can result in contamination of the milking machinery and bacteria in the milk which has public health risks. Furthermore, flies are attracted to the dung on the cow's
10 tail; the flies are likely to lay eggs and maggot infection can result in serious health problems for the cow. This filthy state of the cow's tail could result in disease in the cow such as mastitis, if the dirt is transferred onto the cow's udder and teats and this can easily happen if the tail is long and comes into contact with the udder and teats when the cow swings her tail. Also, there is the danger of other cows standing on a cow's tail when the
15 tail is lying in the walkway. Any damage to a cow's tail can also result in the cow not showing or coming into heat.

The present invention seeks to alleviate the problems identified above.

20 Accordingly, the present invention provides a guard for an animal's tail for use on a raised bedding area, the guard having at least one tail receiving member for receiving an animal's tail and in use, holding it out of contact with faecal slurry in a walking area adjacent the raised bedding area, thereby preventing the animal's tail from becoming soiled, the guard being adapted to be mounted onto the raised bedding area, the tail receiving member being
25 pivotably moveable between a storage position in which the tail receiving member is lying in abutment with a side wall of the raised bedding area, in which storage position, the tail receiving member is generally perpendicular to the plane of the bedding area and an in-use position in which the tail receiving member is capable of holding an animal's tail therein, the tail guard also comprising means for moving the at least one tail receiving member
30 between the storage position and the in-use position, whereby when an animal lies down on the bedding area, the tail receiving member is moved into the in-use position and when an animal vacates the bedding area, the tail receiving member resumes the storage position.

In either position, the tail guard has the advantage that it does not interfere with the action of mechanical scraping apparatus used for scraping faecal slurry from the walking area adjacent the cubicle.

5

Ideally, in the in-use position, the tail receiving member is co-planar with the plane of the bedding area but could exceed or be considerably less than co-planar.

Conveniently, the means for moving the tail receiving member comprises a fulcrum and
10 lever for causing pivotal movement of the tail receiving member about the fulcrum.

Preferably, the tail guard is substantially "L-shaped" in cross-section with the one limb of the substantially "L" shaped profile being adapted for a bovine animal to exert its weight thereon such that when the animal lies down, the weight of the animal presses down on the
15 limb that is parallel to the cubicle floor.

Advantageously, at least a portion of the lever is included in the long limb of the "L" shaped profile whereby the weight of the animal lying down in the cubicle activates the lever and causes at least one tail receiving member to pivot into the in-use position.
20

Conveniently, the lever may be in the form of an enclosed channel or pipe included in the longer limb of the "L"-shaped tail guard. Alternatively, wire is provided to carry an electric current to a motor unit to power the lifting of the guard.

25 In a further alternative construction, the tail guard may comprise a relatively rigid elongate strip of material functioning as the lever with the remainder of the tail guard being manufactured from relatively flexible material.

Ideally, the fingers of the tail guard are adapted by design, or material choice, or both to
30 reduce all friction and resistance to facilitate the passage of animal waste through the tail guard.

The guards for bovine animal tails of the present invention will now be described more particularly by way of example only, with reference to the accompanying drawings in which are shown several embodiments of the bovine animal tail guards of the invention.

5 In the drawings:

Figure 1 is a perspective view of an individual cubicle without the tail guard mounted thereon;

10 Figure 2 is a perspective view of a first embodiment of a tail guard in accordance with the present invention;

Figure 3 is a perspective view of the tail guard of Figure 2 shown before being mounted on a raised bed cubicle;

15

Figure 4 is a perspective view of a tail guard in a second embodiment with two tail receiving members, each having a channel section;

20 Figure 5(a) is a perspective view of a third embodiment of a tail guard in accordance with the present invention, including a plurality of tail receiving members in the form of hooks;

Figure 5(b) is an exploded view of the tail guard of Figure 5(a) showing an enlarged view of one of the tail receiving hook members which will allow manure, urine and animal waste to pass through the tail guard

25

Figure 6(a) is a perspective view of a tail guard in a fourth embodiment indicated generally by reference numeral 40. The tail guard 40 is shown overlaid by a cow mat 48. The tail guard 40 includes a plurality of tail receiving members in the form of flexible or hinged moveable fingers which will allow manure, urine and animal waste to pass through the tail guard.

30

Figure 6(b) is an exploded view of one of the fingers of the tail guard shown in Figure 6(a);

Ideally the fingers of the tail guard are designed to reduce all friction and resistance in order to facilitate the passing of the animals waste through the tail guard.

Figure 7 is a side view of a tail guard in the first, second or third embodiments respectively showing the positions of the tail guard in the out of use or (storage) position and in the use position (shown in dotted lines);

Figure 8 is a side view of an alternative embodiment of tail guard in accordance with the invention showing the tail receiving member of the tail guard in the storage position and the in-use position (shown in dotted lines);

Figure 9(a) is a side view of a tail guard showing the fulcrum about which the tail receiving member is pivotably moveable and including the rigid tube or pipe or a rigid tube or pipe filled with air or liquid which functions as a lever;

Figure 9(b) is a side view of the tail guard of Figure 9(a) mounted on the raised bedding area of the cubicle;

Figure 10(a) is a side view of an alternative embodiment of tail guard showing the fulcrum about which the tail receiving member is pivotably moveable and the rigid tube or pipe filled with air or a wire to an electrical power source;

Figure 10(b) is a side view of the tail guard of Figure 10(a) mounted on the raised bedding area of the cubicle;

Figure 11 is an alternative embodiment of a tail guard in accordance with the present invention;

Figure 12(a) is a side view of an alternative embodiment of tail guard showing the fulcrum about which the tail receiving member is pivotably moveable and the rigid tube or pipe filled with air or a wire rod which functions as a lever;

Figure 12(b) is a side view of the tail guard of Figure 12(a) mounted on the raised bedding area of the cubicle;

Figure 13(a) is a side view of a further alternative embodiment of tail guard showing the fulcrum about which the tail receiving member is pivotably moveable and the rigid tube or pipe filled with air or a wire rod which functions as a lever;

Figure 13(b) is a side view of the tail guard of Figure 13(a) mounted on the raised bedding area of the cubicle;

Figure 14 is a side view of a currently preferred embodiment of tail guard showing the fulcrum about which the tail receiving member is pivotably moveable and the rigid tube or pipe filled with air or a wire rod which functions as a lever;

Referring to the drawings, Figure 1 is a perspective view of an individual cubicle indicated generally by numeral 100 having a raised bedding area 101 on which a bovine animal, for instance a cow, may lie down. In the plane perpendicular to the plane of the bedding area 101, is a side wall 102. A walking area on which the animals may walk is indicated generally by reference numeral 105 and it is this area onto which, faeces and urine are deposited.

Referring now to Figure 2 and 3, a first embodiment of the tail guard is indicated generally by reference number 10 and is shown mounted on a cubicle. The tail guard 10 has a generally "L" - shaped cross-sectional profile with the longer limb of the "L" - shape providing the panel 11 on which an animal may lie down. Alternatively, a cow mat of known type may be placed on top of the panel 11 along the side remote from the tail receiving member and the animal may lie directly onto the mat, with the weight of the animal being transferred through the mat to the panel 11. The animal's weight thus exerts a downward force on the panel 11 of the tail guard 10. This results in the tail receiving member 12 being pivotably moved upwardly into the in-use position in which the tail receiving member 12 is lying co-planar with the plane of the panel 11. The tail guard 10 also includes a channel 13 defined by the hook-like profile along the end of the tail

receiving member 12. With the tail receiving member 12 in the in-use position, the tail of an animal lying in the cubicle will be supported in the tail receiving member 12 and the tail will be prevented, by the channel 13, from dangling down into the slurry on the walkway. Channel 13 is perforated to allow all animal waste to pass through the tail guard 10 with the minimum resistance possible.

In the following description of each of the embodiments of the tail guard of the invention, like numerals will be used to describe like features.

Referring now to Figure 4, a tail guard in a second embodiment is shown and is indicated generally by reference numeral 20. The tail guard 20 includes two tail receiving members 22, 21' with a gap there between. The tail guard 20 has similar features and operates in a similar way to the tail guard 10. The area holding the tail is perforated or segmented to allow all animal waste to pass through the tail guard 20 with the minimum resistance possible.

Referring now to Figures 5(a) and 5(b), a tail guard in a third embodiment is shown indicated generally by reference numeral 30. The tail guard 30 includes a plurality of tail receiving members in the form of hooks 32(a) through to 32(p). As in the first and second embodiments, when the cow lies down and exerts a downward force on the panel 31, the plurality of tail receiving members in the form of hook 32(a) through to 32(p) are pivoted upwardly to receive and support the animal's tail so that it is not in contact with the faecal slurry in the walkway 105.

Referring now to Figure 7, the operation of the tail guard 30 will be described. The in-use and storage positions of the tail guard 30 are shown in Figure 9 with the in use position shown in dotted lines.

When the animal lies down, the animal exerts a downward force on panel 30 which includes lever 35 and this force on the lever 35 causes the tail receiving member 32 to pivot upwardly about pivot point 36 to the position shown in dotted lines in Figure 7. However, this position can be lesser or greater than that shown in the drawing. The tail

receiving members 32(a) to 32(p) are held in the in-use position under action of the downward force on the lever (channel 35). Thus, the tail receiving members are held in the in-use position for as long as the cow is lying down. When she stands up, the tail receiving fingers pivot downwardly into the storage position where it does not impede
5 scraping of the walkway by mechanical scrapers.

Referring now to Figures 6(a) and 6(b), a tail guard in a fourth embodiment is indicated generally by reference numeral 40. The tail guard 40 is shown overlaid by a cow mat 48. The tail guard 40 includes a plurality of tail receiving members in the form of flexible or
10 hingedly moveable fingers 42(a) through to 42(f). The fingers are designed to allow all animal waste to pass through the tail guard 40 with the minimum resistance possible

Referring now to Figure 8, the operation of the tail guard 40 will be described. The tail guard 40 is shown in Figure 8 with the tail receiving finger 42(f) shown in the storage
15 position and shown in dotted lines the in-use position. The tail guard 40 includes a lever provided by an enclosed channel 45 which contains fluid or a gel. A fulcrum (pivot point) 46 is also included in the tail guard 40. When the cow lies down on panel 41 and exerts a downward force as indicated by arrow A, the tail receiving finger 42(f) together with the other tail receiving fingers (not shown in Figure 8) are pivoted upwardly about the fulcrum
20 46 into the in-use position in which the tail receiving member is co-planar with the panel 41 and is capable of supporting and holding the tail out of contact with the faecal slurry in the walkway 105 adjacent the raised bedding area. The tail receiving members 42(a) to 42(F) are held in the in-use position under action of the downward force on the lever (channel 45). Thus, the tail receiving members are held in the in-use position for as long
25 as the cow is lying down on the lever. When she stands up, the tail receiving fingers pivot downwardly into the storage position where it does not impede scraping of the walkway by mechanical scrapers.

In Figures 9(a) and (b), an alternative embodiment of tail guard is shown, indicated
30 generally by reference numeral 50. The tail guard 50 includes panel 51 on which a cow's weight bears down when she lies down in her cubicle, a lever 55 comprising a channel or pipe, a fulcrum 56 and a tapered section 57. The tail guard 50 operates in the same

manner as described above in relation to Figure 7 (tail guard 30) and Figure 8 (tail guard 40).

Referring now to Figure 10, a tail guard in an alternative embodiment of tail guard is indicated generally by reference numeral 60. The tail guard 60 includes tail receiving member 62 with hook member 63. The tail guard 60 comprises a fulcrum 96 and a lever 65 defined by a rigid bar, rigid channel or rigid pipe 65. The tail guard 60 includes a ramp (angled) section 67 leading to an apex 68 on the upper surface 61 of the tail guard. When the cow lies down in her cubicle, a downward force indicated by arrow B is exerted on the lever 65. Lever 65 is pressed downwardly so that it comes into contact with fulcrum 96 and the tail receiving member 62 is therefore urged upwardly under the pivot action about the fulcrum 96 and the tail receiving member 62 assumes the in-use position. The tail guard 60 thus operates and is used in the same way as described in relation to Figure 7 (tail guard 30) and Figure 8 (tail guard 40).

In Figure 11 is shown an alternative embodiment of tail guard indicated by generally reference numeral 70. The tail guard 70 includes a lever 75 comprised of a tube or pipe with fluid or alternatively the lever may be controlled by a wire to an electric motor. A fulcrum 76 is also included. The tail guard 70 operates in the same way as described in relation to tail guard 30 shown in Figure 7 and tail guard 40 shown in Figure 8.

Referring now to Figure 12, a tail guard in a further alternative embodiment is shown and is generally indicated by reference 80. The tail guard 80 includes lever 85 comprising a rigid channel or tube filled with fluid. Alternatively, the lever 85 may consist of a wire 85. The tail guard 80 includes a fulcrum 86. The tail guard 80 operates in the same manner as described in relation to tail guard 30 shown in Figure 7 and tail guard 40 shown in Figure 8.

An alternative embodiment of tail guard in accordance with the present invention is shown in Figures 13(a) and (b) and is indicated generally by reference numeral 90. The tail guard 90 includes lever 95 comprising a rigid channel or tube filled with fluid. A fulcrum 96 is also included and consists of a rigid piece of material. Optionally, a notch 99 is provided in the underside of the tail guard 90. The notch 99 may not be required in certain

applications. The tail guard 90 operates in the same manner as described in relation to tail guard 30 shown in Figure 7 and tail guard 40 shown in Figure 8.

Referring now to Figure 14, the currently prepared embodiment of tail guard is shown and is generally indicated by reference numeral 110. The tail guard 110 comprises a fulcrum 116 which comprises a relatively rigid layer of material while the remainder of the tail guard 110 is manufactured from a semi-rigid polymeric material such as polyurethane (PU) or polyvinyl Acetate polymer. The tail guard 110 operates in the same manner as described in relation to tail guard 30 shown in Figure 7 and tail guard 40 shown in Figure 8. Ideally, the tail guard 110 is provided with a segment 118 which is made of different material than the main bulk 120. The segment 118 is preferably made of a material with a high return elasticity rating so as to return to its original dimensions whereas the main bulk 120 is made of a material with a high compressibility compression set rating so as to return to its original thickness. Depending on the performance of the material of the segment 118, the segment may be extended into the gap 119 to adhere to the leg 112.

In a further modification not shown in the drawings, the modified tail guard is fixed directly to the riser of the step up to the bedding area and is not connected to the mat and therefore does not have to be L-shaped.

It will, of course, be understood that the tail guard of the present invention is not limited to the specific details described herein, which are given by way of example only and that various modifications and alternations are possible within the scope of the invention.

CLAIMS:

1. A guard for an animal's tail for use on a raised bedding area, the guard having at least one tail receiving member for receiving an animal's tail and for holding it out of
5 contact with faecal slurry in a walking area adjacent the raised bedding area, thereby preventing the animal's tail from becoming soiled, the guard being adapted to be mounted onto the raised bedding area, the tail receiving member being pivotably moveable between a storage position and an in-use position in which the tail receiving member is capable of holding an animal's tail therein, the tail guard also comprising means for moving the at
10 least one tail receiving member between the storage position and the in-use position, whereby when an animal lies down on the bedding area, the tail receiving member is moved into the in-use position and when an animal vacates the bedding area, the tail receiving member resumes the storage position.

15 2. A guard as claimed in Claim 1, wherein the means for moving the tail receiving member comprises a fulcrum and a lever for causing pivotal movement of the tail receiving member about the fulcrum; and

optionally wherein in the in-use position, the tail receiving member is co-planar
20 with the plane of the bedding area.

3. A guard as claimed in Claim 1 or Claim 2 wherein the tail guard is substantially "L-shaped" in cross-section with one limb of the substantially "L" shaped profile being adapted for a bovine animal to exert its weight thereon and the other limb defining the at
25 least one tail receiving member;

optionally wherein at least a portion of the lever is included in the longer limb of the "L" shaped profile whereby the weight of the animal lying down in the cubicle operates the lever and causes the at least one tail receiving member to pivot into the in-use position;
30

optionally wherein the lever is in the form of an enclosed channel or pipe included in the longer limb of the "L"-shaped tail guard; and

optionally wherein an electrical wire is provided to carry an electric current to a motor unit to power the movement of the tail receiving member between the storage position and the in-use position.

5

4. A guard as claimed in any one of the preceding claims wherein the tail guard comprises a relatively rigid elongate strip of material functioning as the lever with the remainder of the tail guard being manufactured from relatively flexible material.

10 5. A guard for an animal's tail for use on a raised bedding area, substantially as herein described with reference to and as shown in the accompanying drawings.

15

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DUBLIN 2.

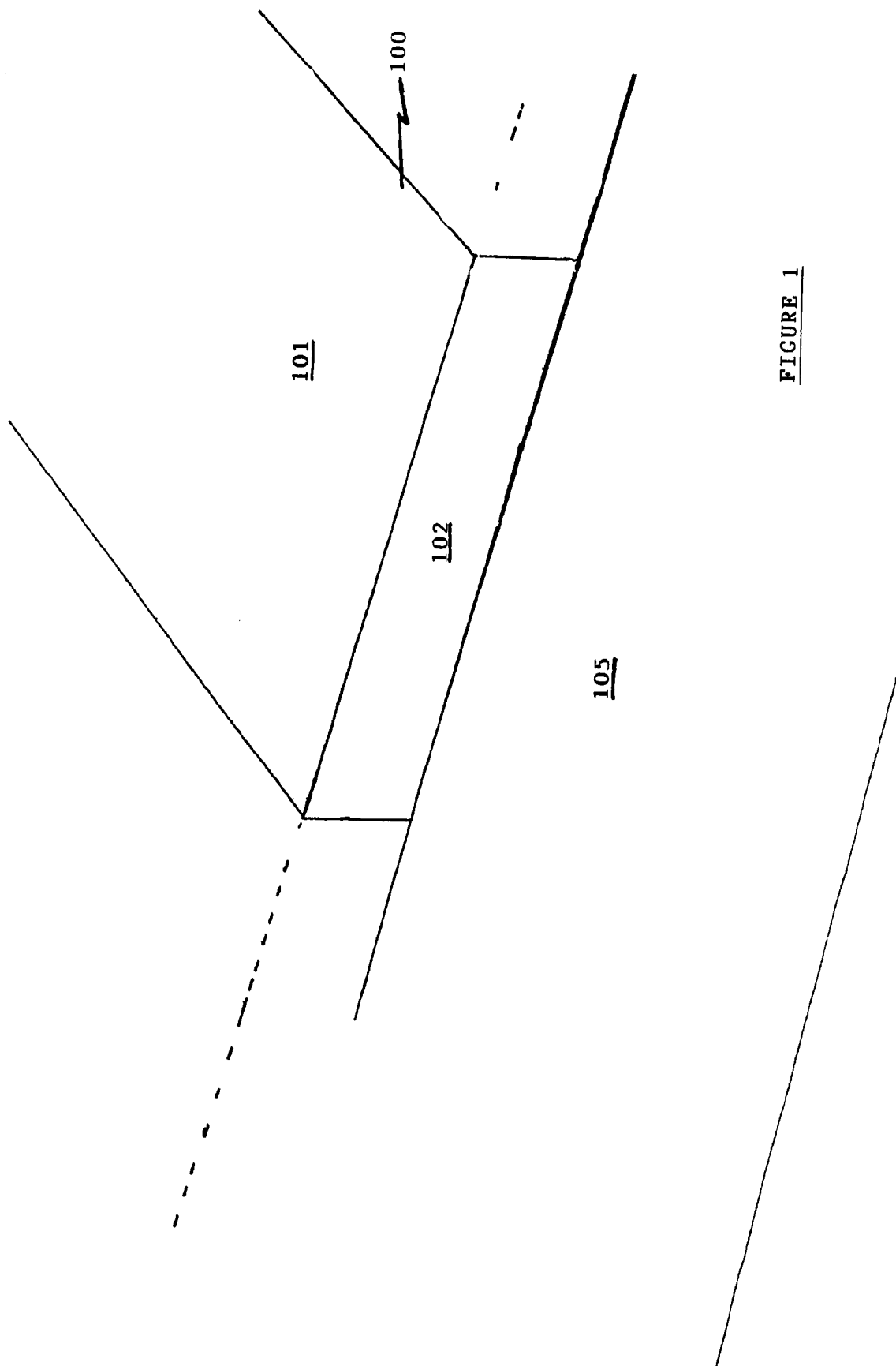


FIGURE 1

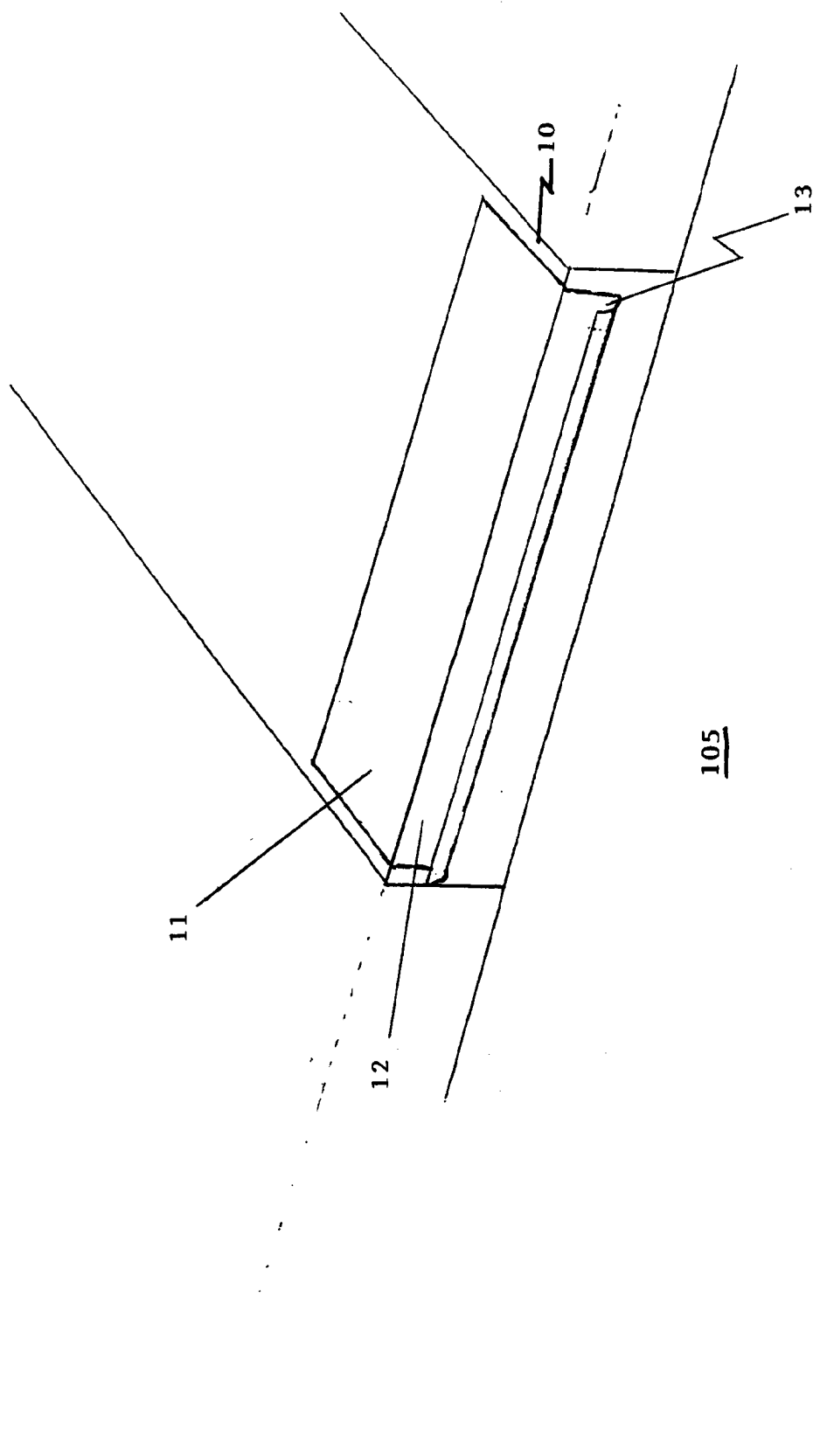


FIGURE 2

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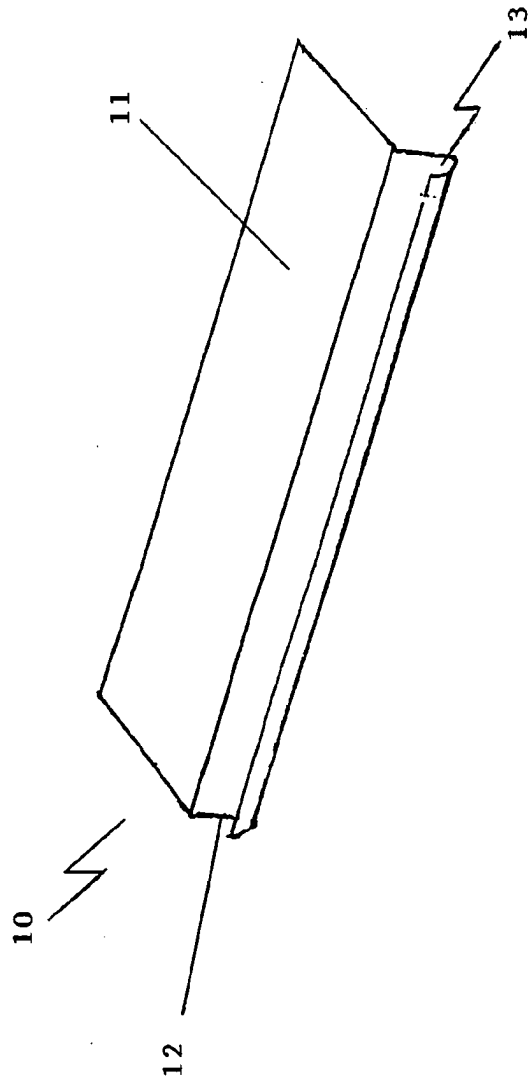


FIGURE 3

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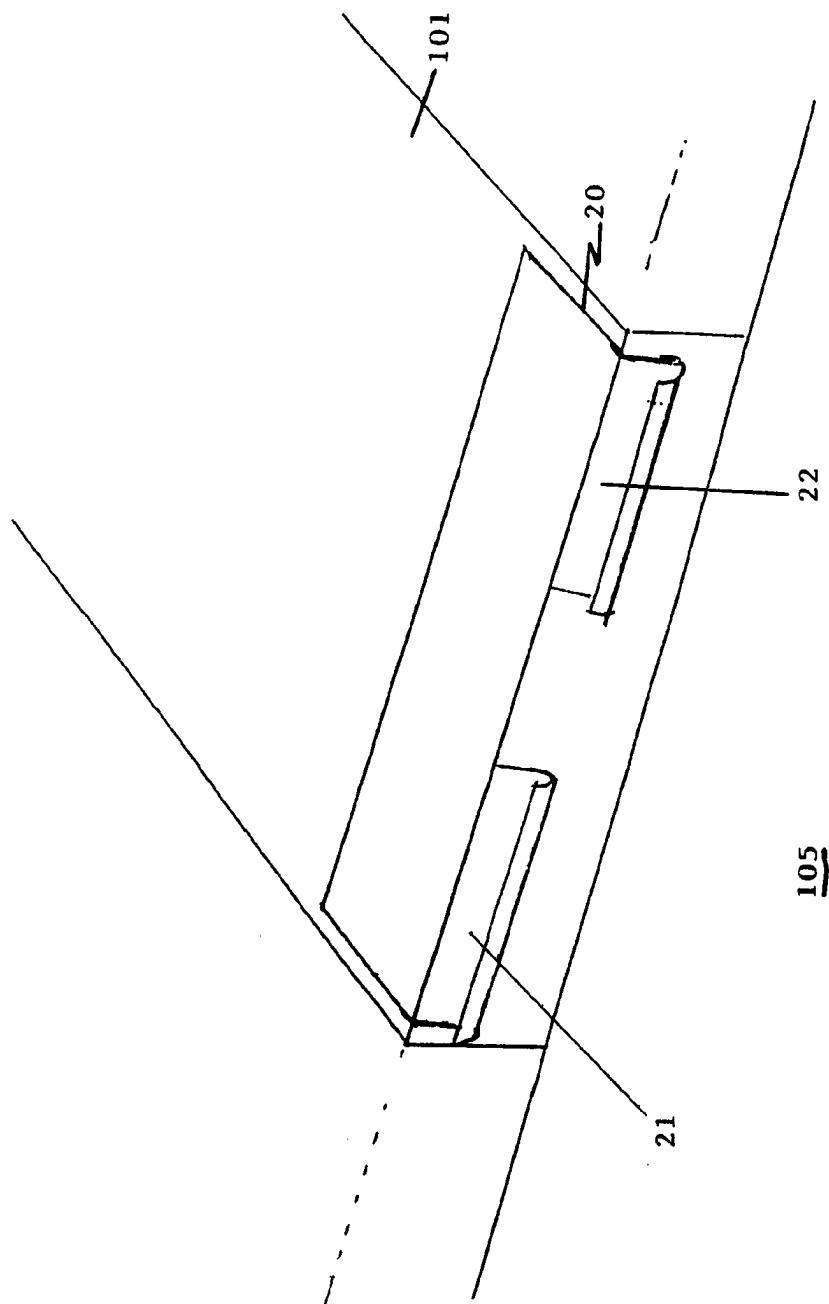


FIGURE 4

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FIGURE 5a

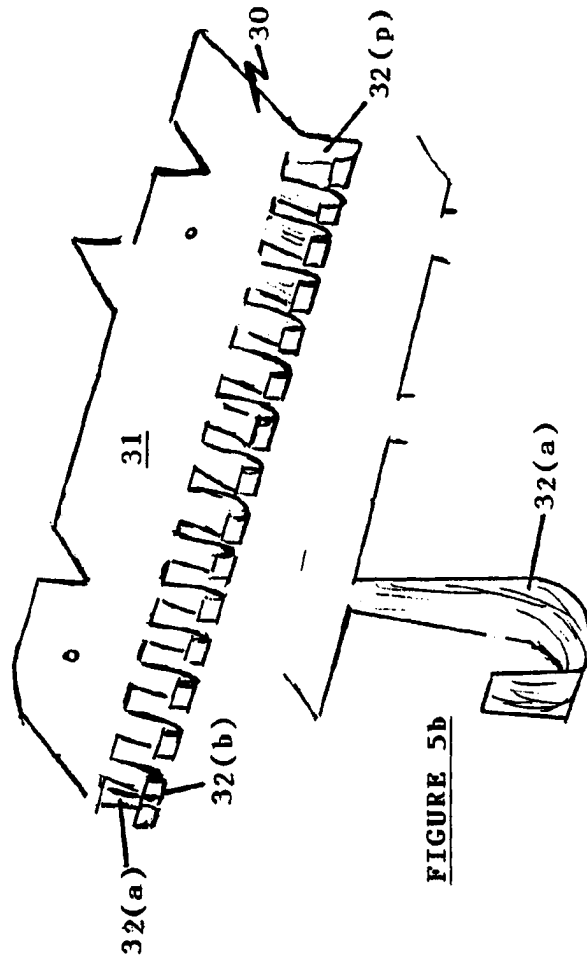


FIGURE 5b



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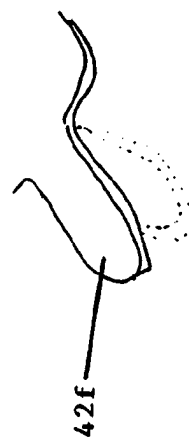
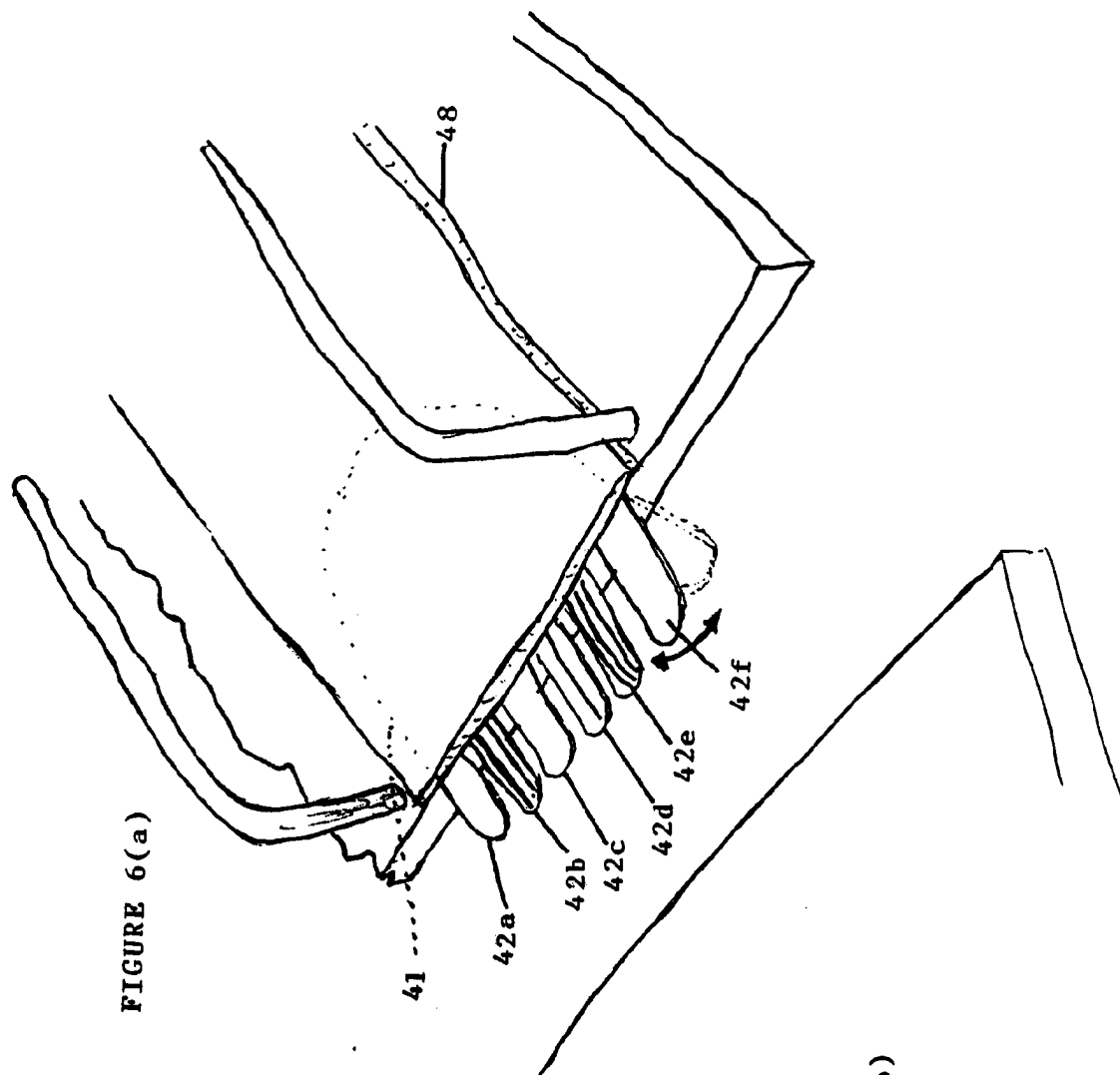


FIGURE 7

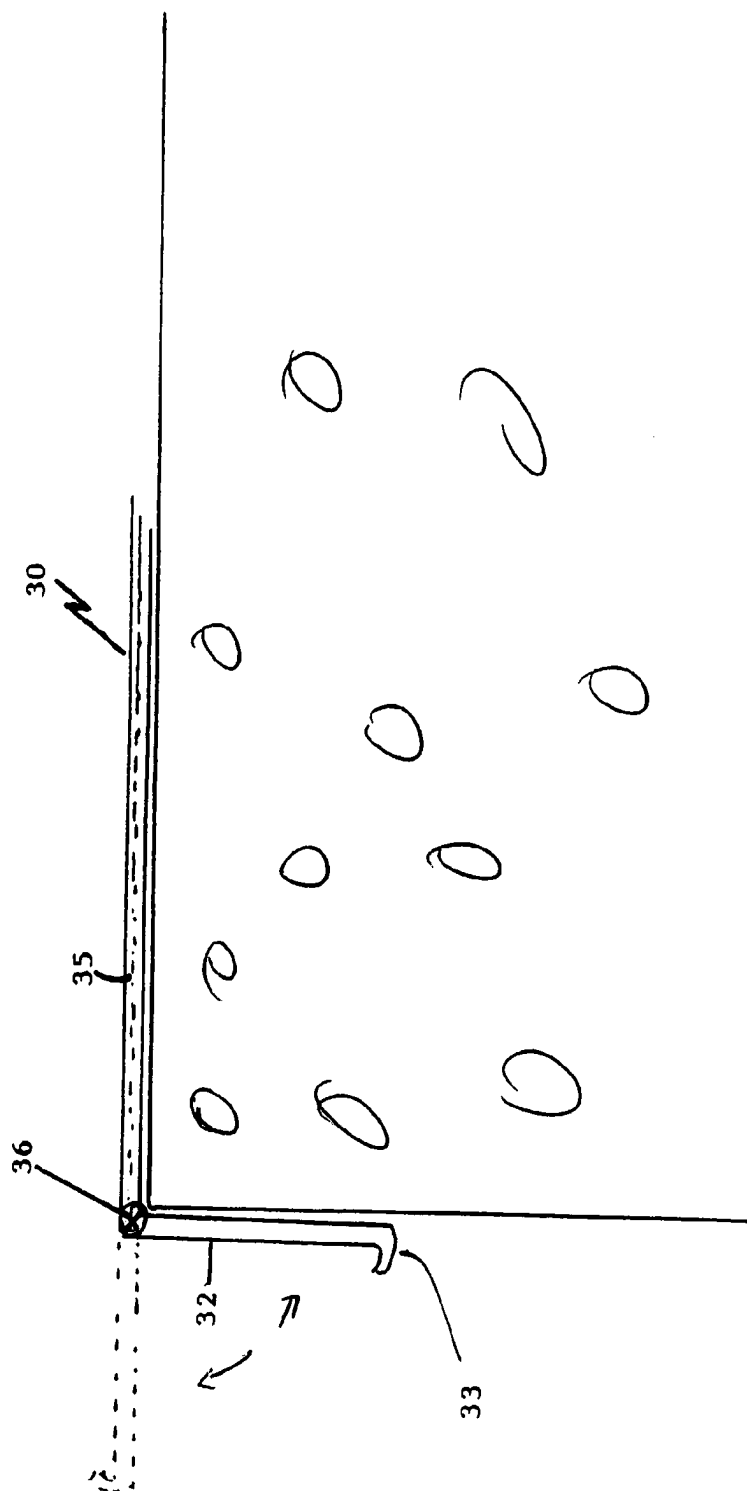
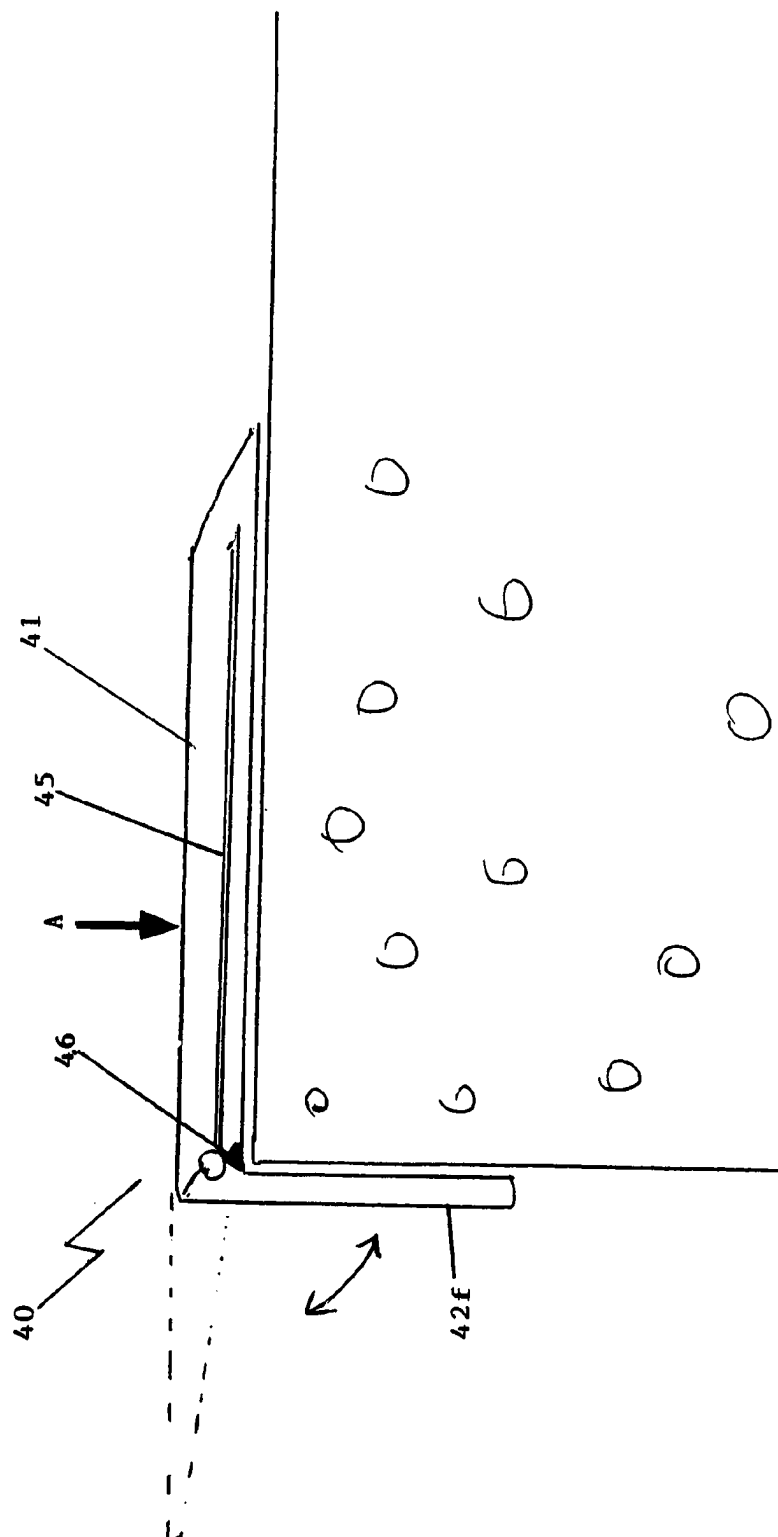


FIGURE 8



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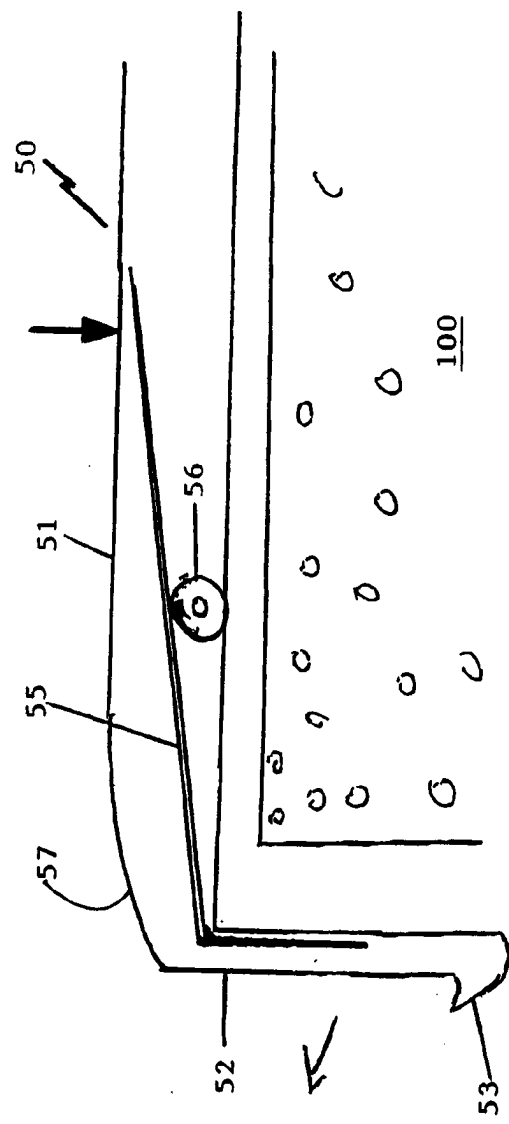


FIGURE 9
(a)

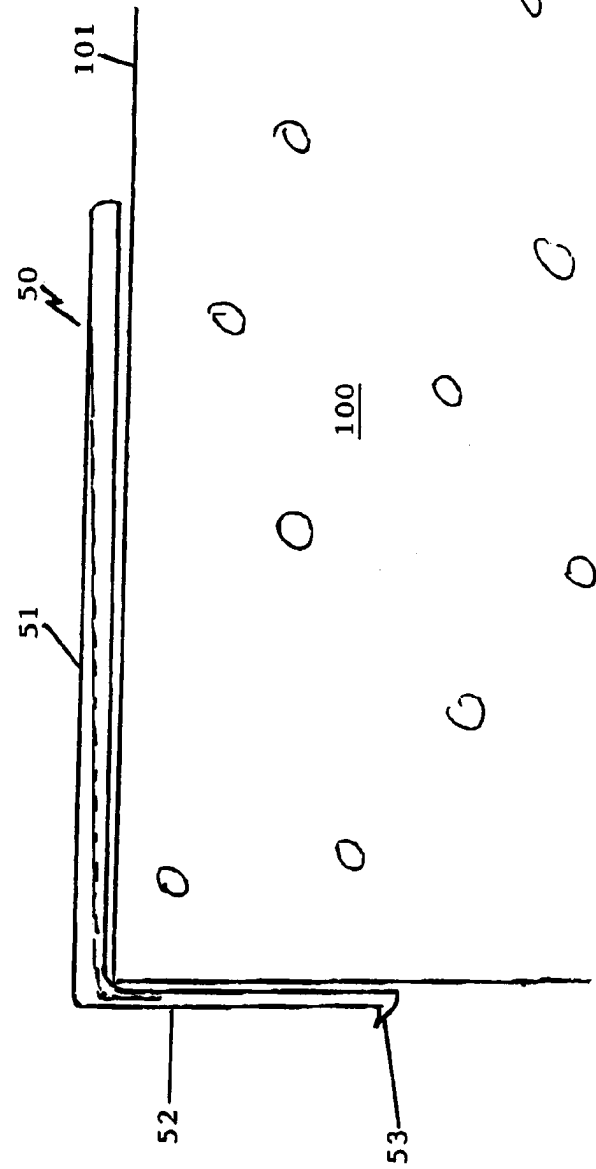
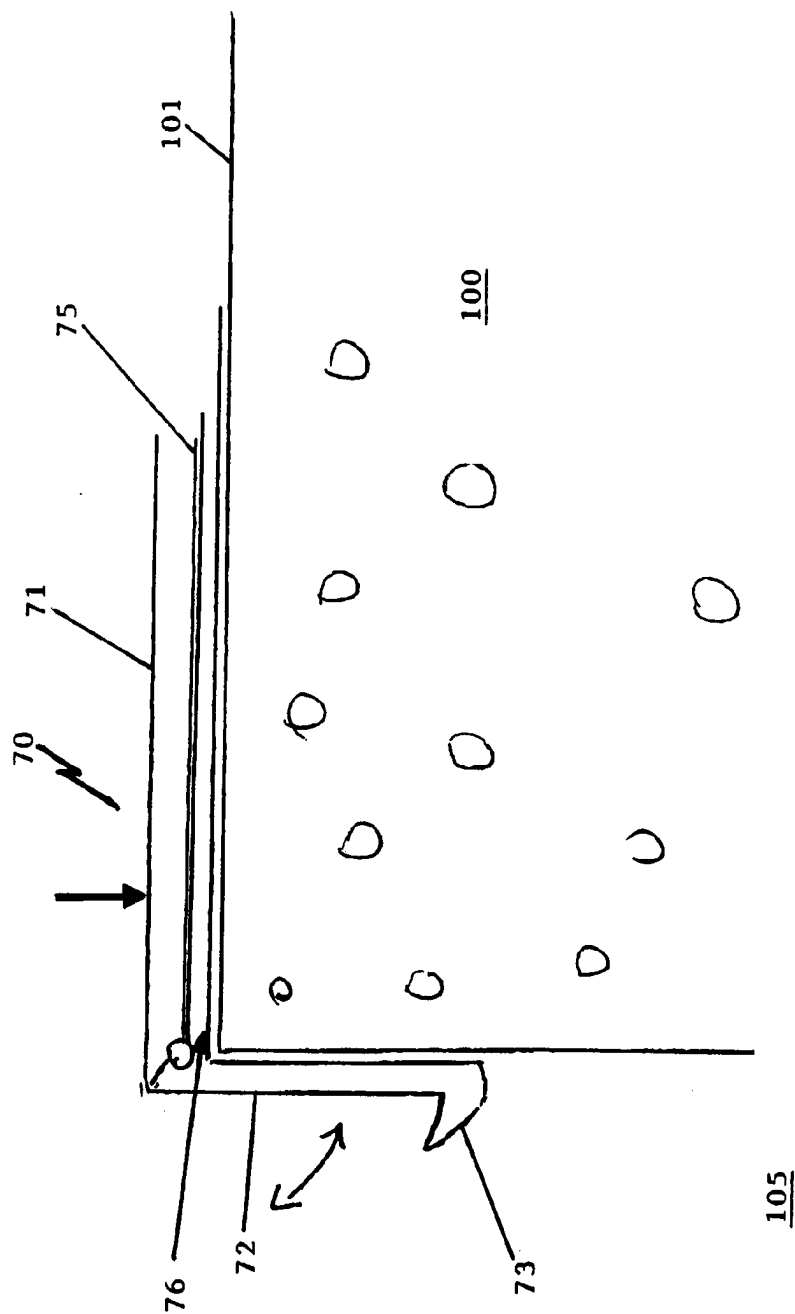


Figure 9
(b)

FIGURE 11



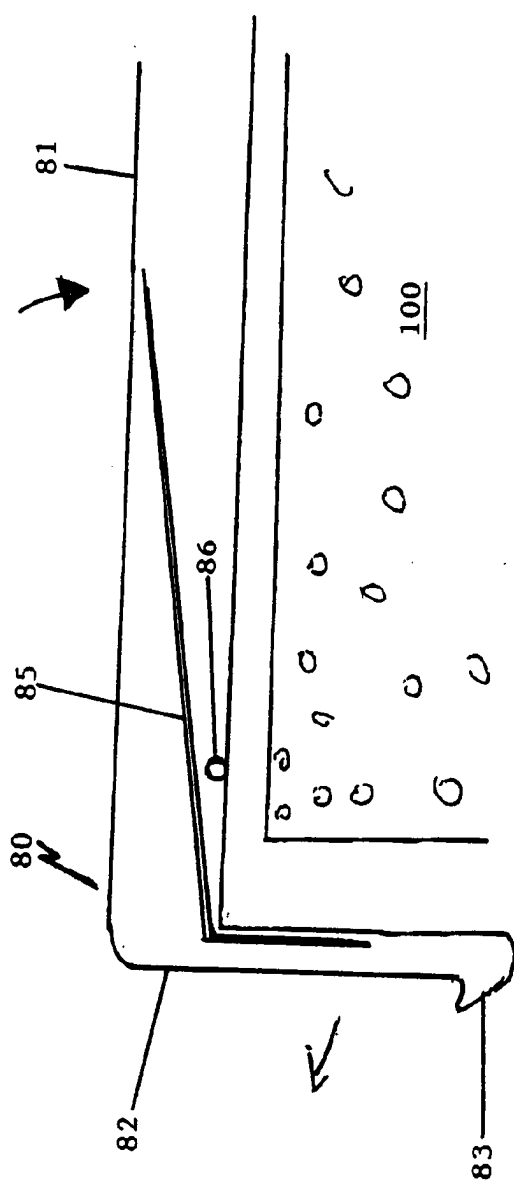


FIGURE 12 (a)

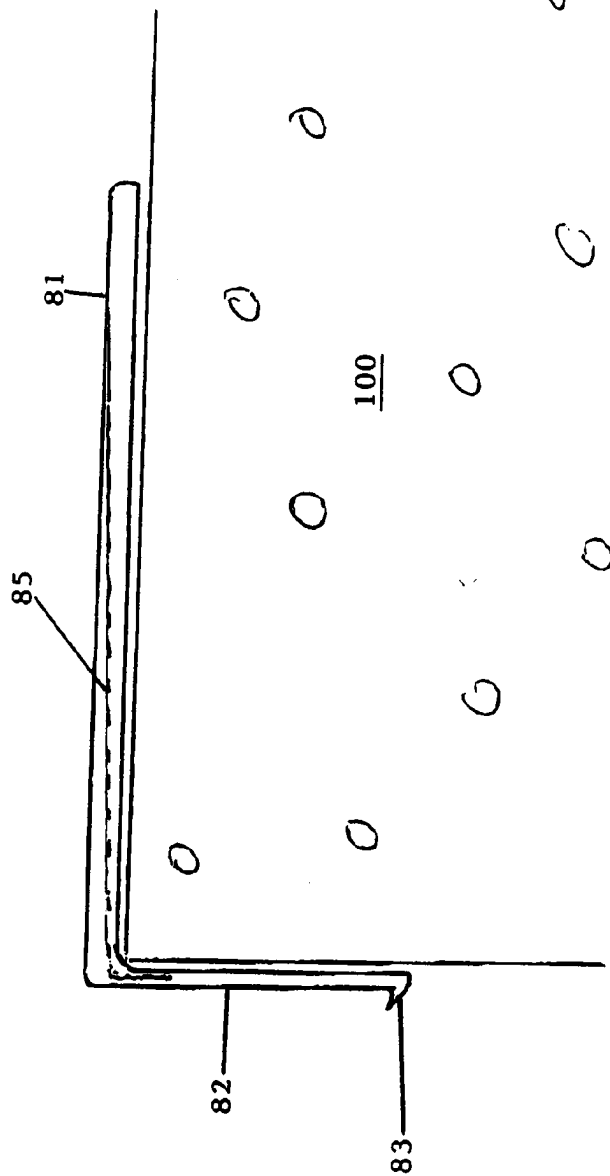


FIGURE 12 (b)

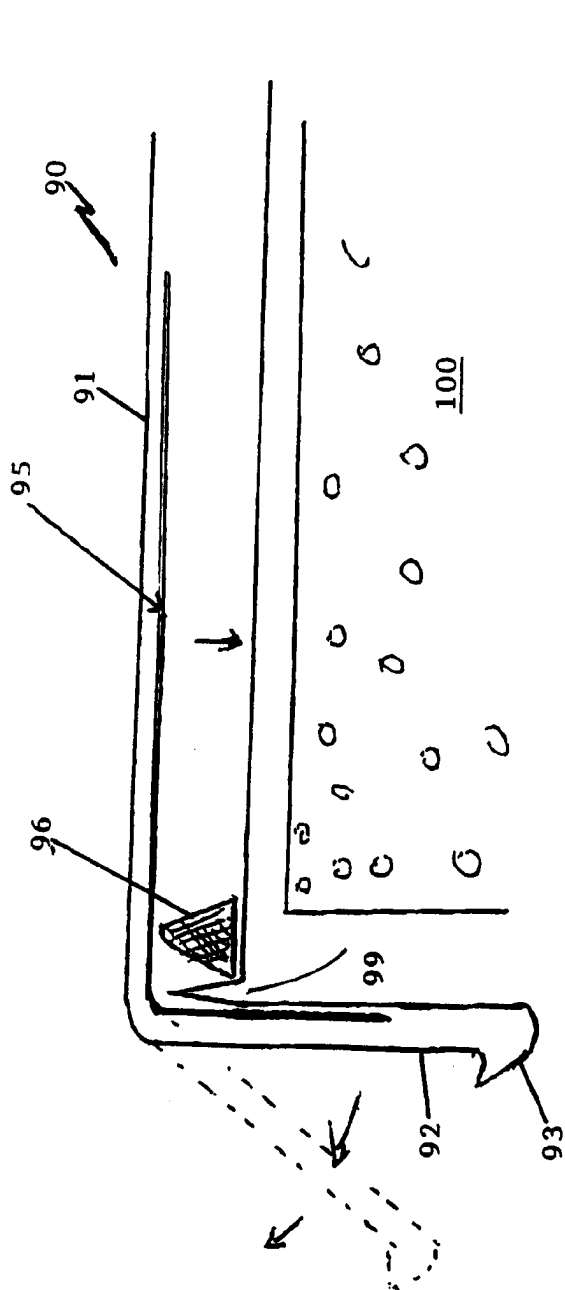


FIGURE 13 (a)

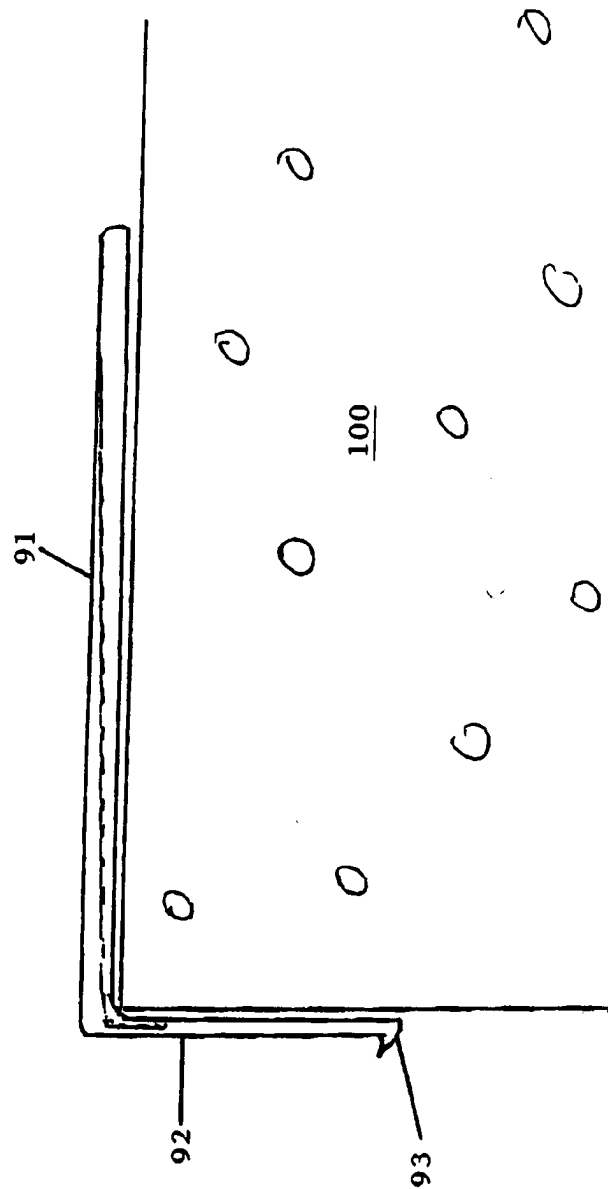


FIGURE 13 (b)

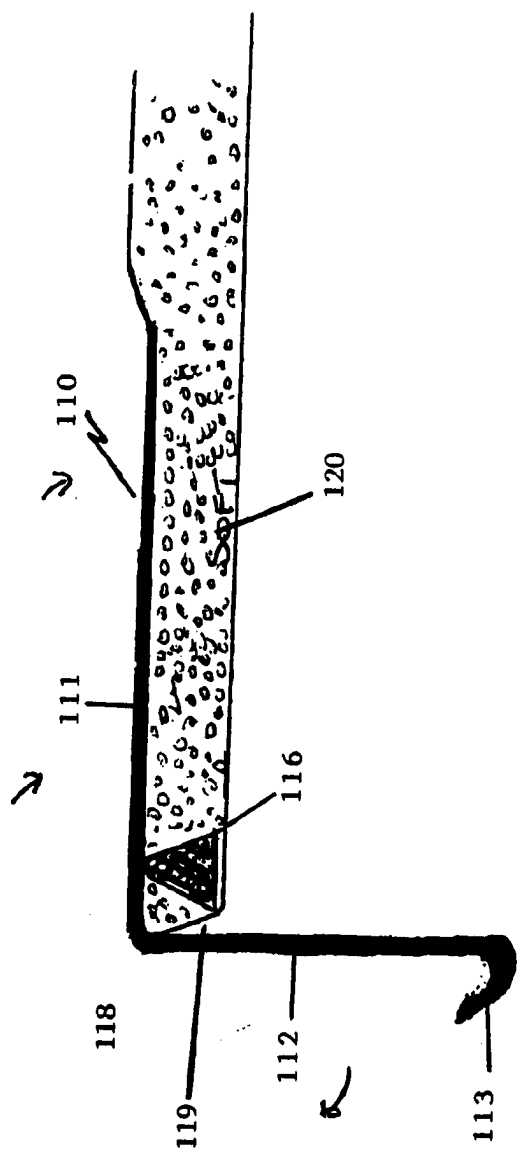


FIGURE 14.

