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(54) **SCREEN AND SCREEN DOOR FOR A RAILWAY PLATFORM**

GITTER UND GITTERTÜR FÜR BAHNSTEIG

PROTECTION ET PORTE PALIERE DESTINEES A UN QUAI DE GARE

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Description

[0001] The invention relates to a railway platform screen door and a screen wall for a railway platform, in particular but not exclusively for an underground or sub-surface railway.

[0002] The conventional railway station consisting of a raised platform adjacent to the track is essentially the same design as has been used since the beginning of the railway industry in the nineteenth century and is an effective solution to the problem of maximising passenger boarding speed.

[0003] However, the basic platform arrangement suffers from several well known problems, such as passengers falling under trains either deliberately or unintentionally and also litter from passengers falling onto the track. Although incidents of people falling under trains are not common, they result in significant disruption to the network and are traumatic incidents for everyone present. The problem of litter on the track has also increased in recent years and can represent a serious health and safety risk on underground or sub-surface systems where the litter will remain in tunnels until it is cleared up.

[0004] Platform screen systems or automated platform gates are well known in the railway industry as one approach of dealing with these problems. Due to the problem of lining up doors on the platform and the train, these systems are usually only installed on lines where the rolling stock is standardised, which in practice is on metro or underground systems, although some dedicated high speed systems are also provided with screens.

[0005] There are two main types of platform screen door system in use at present. The commonest type is a full height system (e.g. around 2m high or more vertical screens). The full height system is usually adopted for newly built railway systems and is in practice essential in air-conditioned systems as otherwise the air conditioning system loses air to the rail tunnels, which is highly inefficient.

[0006] However, in many systems, particularly older systems, the air in stations is conditioned by the passage of the train through the station, which forces air down the tunnel. In such a system, the use of a full height screen door is precluded as the air throughput to the platform is insufficient to make conditions tolerable. Additionally, many platforms on old systems are quite narrow and a full height screen would be claustrophobic.

[0007] One solution to this that has been used is a half height screen or gate. This consists of a rigid vertical screen and gate, usually about 1m30 high, which permits the air-conditioning solution provided by the passage of the train to be used and reduces the problems caused by litter and people falling onto the track. However, accidents and suicides still happen on these systems and they have not been adopted widely. An example of such a system is described in EP 1386813.

[0008] The present invention therefore seeks to provide a platform screen and platform screen door that

solves these problems.

[0009] According to the invention there is provided barrier for a railway platform which platform has a surface and an edge comprising a first wall surface facing away from the platform edge and a second wall surface facing the platform edge, a top edge connecting the first and second wall surfaces, wherein at least one of the first or second wall surfaces is inclined or shaped at least in part away from a vertical plane perpendicular to the platform surface such that, in the installed position, the distance between the vertical plane defined by the platform surface and edge and a vertical plane defined by the platform surface and the wall surface remote from the platform edge is greater than the distance between the first and second wall surfaces adjacent to the top edge.

[0010] Preferably, the first and/or second wall surfaces are curved away from the platform edge. Preferably, the spatial separation of the first and second walls at their respective bottom edges is sufficient that the barrier is adapted to house the drive mechanism for a sliding door. Preferably the barrier is adapted to receive a sliding door, which may have a substantially similar profile to the barrier. Preferably, the lower part of the first wall surface is angled away from the plane of the surface of the remaining part of the wall so as to keep passengers away from the platform edge. Preferably, the barrier has a height between 1100 and 1500mm from the platform surface.

[0011] The invention also provides for a door for a barrier system for a railway platform of the type described above, wherein the door in the installed position is curved away from the platform edge.

[0012] Exemplary embodiments of the invention will now be described in greater detail with reference to the drawings in which

Fig. 1 shows a first profile of a platform screen door system;

Fig. 2 shows a second profile of a platform screen door system;

Fig. 3 shows a third profile of a platform screen door system;

Fig. 4 shows a fourth profile of a platform screen door system;

Fig. 5 shows a fifth profile of a platform screen door system;

Fig. 6 shows a sixth profile of a platform screen door system.

[0013] Figure 1 shows a profile of a platform screen door system comprising a barrier section 1 housing a gate 2. The barrier section 1 comprises a first wall 3, which in use will face the platform, the first wall 3 being slightly inclined to the vertical and a second wall 4, which in use will face away from the platform towards the platform edge, which wall is inclined at a substantially greater angle to the vertical than the first wall 3. The two walls 3, 4 are joined by a generally curved cap 5. The effect of the different angles of the first and second walls is that

the apex of the cap 5 is located closer to the vertical plane of the bottom edge 6 of the first wall 3 than to the vertical plane bottom edge 7 of the second wall 4. The gate 2 is housed within the barrier section 1 and is mounted at an angle to the vertical substantially parallel to that of the section wall 4 so that in the closed position the top of the door is substantially as far away from the vertical plane of the platform edge as the top of the barrier. The drive mechanism for the door can be housed in the base of the barrier section adjacent to the lower edge of the door 2. The barrier and door control passenger access to and from a train.

[0014] Figure 2 shows an alternative architecture to the system of Figure 1, again comprising a barrier section 11 housing a door 12. The wall 14 facing the platform edge 14 is in this case curved away from the platform edge and the door 12 shares a similar curved profile. The wall 13 facing the platform comprises a stepped lower portion 15, which is generally curved in the opposite direction to the wall 13 and an upper curved portion 16 which is curved in the opposite direction and is substantially concentric with the curved wall 13. The stepped lower portion 15 enables the drive gear to be housed within the barrier section 11.

[0015] Figure 3 shows a further alternative architecture to figures 1 and 2 again comprising a barrier section 21 housing a door 22. In this case the wall 24 facing the platform edge is generally planar but angled to the vertical away from the platform edge such that the top of the barrier section is located spatially more distant from the vertical plane of the platform edge than the bottom edge 26 of the wall 24. The wall 23 facing the platform is in this case curved such that the bottom edge 27 of the wall 24 is located further away from the vertical plane of the platform edge than the top of the barrier. The door 22 is in this case curved so that it is substantially concentric with the curved wall 23. In this embodiment the drive gear is located in the space between the lower edge of the door 22 and the bottom edge 26.

[0016] Figure 4 shows a further alternative architecture to that of figures 1 to 3 again comprising a barrier section 31 housing a door 32. As in figure 3, the wall 34 facing the platform edge is generally planar but angled to the vertical away from the platform edge such that the top of the barrier section is located spatially more distant from the vertical plane of the platform edge than the bottom edge 36 of the wall 34. The wall 33 facing the platform is in this case curved such that the bottom edge 37 of the wall 34 is located further away from the vertical plane of the platform edge than the top of the barrier. The top part of the barrier 31 is in this case lipped so that there is a small overhang over the wall 33. The door in figure 4 has a more complex profile than the doors of figures 1 to 3. The profile of the door side facing the platform is generally curved being again substantially concentric with the curve of the wall 33. The rear face of the door however has two parts to the profile. The upper part of the profile 38 is generally curved and substantially con-

centric with the front face, whereas the lower part of the profile 39 is generally angled away from the curve of door so as to form a generally triangular cross-section.

[0017] The embodiment of figure 5 comprises again a barrier section 41 housing a door 42. The wall 44 which in use faces the platform edge is substantially vertical. The wall facing the platform in the installed position comprises a first upper portion 45 which is substantially vertical and parallel to the wall 44 and a lower portion 46, which is generally convex curved away from the wall 44 and towards the platform surface. The top of the barrier is curved in a similar manner to the barriers of figures 1 to 3.

[0018] The embodiment of figure 6 is substantially the same as the embodiment of figure 5, save that the top of the barrier is substantially the same as the top in figure 4. For both the embodiments of figures 5 and 6, the drive gear is located in the space between the door and the lower curved portion of the wall 46. In each of the embodiments of figures 1 to 6, the distance between vertical planes transecting the fore and rearmost points of the barrier is greater than the distance between the first and second wall surfaces.

[0019] In use, it has been found that there are three general scenarios for passengers encroaching in the space beyond the upper edge of the gate. These are stretching out an arm over the barrier, leaning against the barrier and looking out over the barrier. As can be readily understood a passenger stretching out an arm over the barrier reaches the furthest point from the barrier and in tests, distances of 700mm are easily reached. For leaning against the fence, passengers typically encroach about 300mm over the barrier. However, for looking out over the barrier, the distances are less standardised as they depend on the height of the passenger and the height of the barrier. For a low barrier height of say 1100mm, distances of 600mm can be easily reached by taller passengers whereas for a 1300mm, perhaps only 300mm will be reached.

[0020] The screen and door designs of figures 1 to 6 address this issue by having their upper edge further away from the platform edge than the bottom edge of the screen facing the platform edge. For a 1300mm door system, if the door and barrier are inclined at an angle of approximately 13° to the vertical, then a passenger leaning over the edge by 300mm does not encroach beyond the edge of the platform. In the designs of figures 2 to 6, the stepped portion or curved portion further forces passengers further away from the edge. Due to the comparatively small angle the advantages of the lower height door systems are maintained without increasing the risk of creating a claustrophobic effect on passengers but the safety problems inherent in the use of a lower height barrier are greatly reduced.

[0021] The barrier and gate can be made from a variety of materials including aluminium extrusions or plastic materials. The barrier can be manufactured so that the respective first and second walls form part of a single struc-

ture or the walls can be made separately and joined together.

Claims

1. A barrier (1) for a railway platform, which platform has a surface and an edge, which barrier is adapted to co-operate with a door or gate (2) for controlling passenger access to and from a train, the barrier comprising a first wall surface (3) facing away from the platform edge and a second wall surface (4) facing the platform edge, a top edge connecting the first and second wall surfaces, wherein at least one of the first or second wall surfaces (3,4) is inclined or shaped at least in part away from the vertical such that, in the installed position, the distance between the vertical plane transecting the forward-most point (7) of the barrier and a second vertical plane transecting the rearmost point (6) of the barrier is greater than the distance between the first and second wall surfaces adjacent to the top edge.
2. A barrier for a railway platform according to Claim 1, wherein the first and/or second wall surfaces are curved away from the platform edge.
3. A barrier for a railway platform according to Claim 1 or Claim 2, wherein the spatial separation of the first and second walls at their respective bottom edges is sufficient that the barrier is adapted to house the drive mechanism for a sliding door.
4. A barrier for a railway platform according to any one of Claims 1 to 3, wherein the barrier is adapted to receive a sliding door.
5. A barrier for a railway platform according to any one of Claims 1 to 4, wherein the lower part of the first wall surface is angled away from the plane of the surface of the remaining part of the wall so as to keep passengers away from the platform edge.
6. A barrier for a railway platform according to any one of Claims 1 to 5, wherein the barrier has a height between 1100 and 1500mm from the platform surface.
7. A door for a barrier system for a railway platform, according to any one of claims 1 to 6 wherein the door in the installed position is curved away from the platform edge.

Patentansprüche

1. Eine Sperre (1) für einen Bahnsteig mit einer Bahnsteigoberfläche und einer Bahnsteigkante, wobei die

Sperre so ausgelegt ist, dass sie mit einer Tür oder einem Tor (2) zusammenwirkt, das den Zugang von Passagieren zu bzw. von Zügen kontrolliert; die Sperre umfasst eine von der Bahnsteigkante abgewandte erste Wandoberfläche (3) und eine der Bahnsteigkante zugewandte zweite Wandoberfläche (4), wobei eine Oberkante die erste und zweite Wandoberfläche verbindet und wobei mindestens eine der beiden Wandoberflächen (3, 4) geneigt oder zumindest teilweise von der Vertikalen wegstrebend geformt ist, so dass in der installierten Position der Abstand zwischen der vertikalen Ebene, die den vordersten Punkt (7) der Sperre schneidet, und einer zweiten vertikalen Ebene, die den hintersten Punkt (6) der Sperre schneidet, größer als der Abstand zwischen der ersten und der zweiten Wandoberfläche in der Nähe der Oberkante ist.

2. Eine Sperre für einen Bahnsteig nach Anspruch 1, wobei die erste und/oder zweite Wandoberfläche von der Bahnsteigkante weg gekrümmt ist/sind.
3. Eine Sperre für einen Bahnsteig nach Anspruch 1 oder Anspruch 2, wobei der räumliche Abstand zwischen der ersten und zweiten Wand an deren jeweiligen Unterkanten ausreichend groß ist, so dass die Sperre den Antriebsmechanismus für eine Schiebetür aufnehmen kann.
4. Eine Sperre für einen Bahnsteig nach einem der Ansprüche 1 bis 3, wobei die Sperre so ausgelegt ist, dass sie eine Schiebetür aufnehmen kann.
5. Eine Sperre für einen Bahnsteig nach einem der Ansprüche 1 bis 4, wobei der untere Teil der ersten Wandoberfläche von der Ebene der Oberfläche der restlichen Wand weg geneigt ist, so dass die Passagiere von der Bahnsteigkante ferngehalten werden.
6. Eine Sperre für einen Bahnsteig nach einem der Ansprüche 1 bis 5, wobei die Sperre eine Höhe von 1100 bis 1500 mm ab der Bahnsteigoberfläche hat.
7. Eine Tür für ein Sperrensystem für einen Bahnsteig nach einem der Ansprüche 1 bis 6, wobei die Tür in der installierten Position von der Bahnsteigkante weg gekrümmt ist.

Revendications

1. Barrière (1) destinée à un quai de gare, lequel quai comporte une surface et un bord, laquelle barrière est adaptée pour coopérer avec une porte ou un portillon (2) pour commander l'accès des passagers pour prendre un ou descendre d'un train, la barrière comprenant une première surface de paroi (3) face

à l'opposé du bord du quai et une deuxième surface de paroi (4) face au bord du quai, un bord supérieur connectant les première et deuxième surfaces de paroi, dans laquelle au moins une de la première ou de la deuxième surface de paroi (3, 4) est inclinée ou formée du moins en partie de manière à s'écarter de la verticale de telle façon que, dans la position installée, la distance entre le plan vertical disséquant le point le plus avant (7) de la barrière et un deuxième plan vertical disséquant le point le plus arrière (7) de la barrière est supérieure à la distance comprise entre la première et la deuxième surfaces de parois adjacentes au niveau du bord supérieur.

2. Barrière destinée à un quai de gare selon la revendication 1, dans laquelle la première et/ou la deuxième surfaces de paroi sont incurvées à l'opposé du bord du quai.
3. Barrière destinée à un quai de gare selon la revendication 1 ou la revendication 2, dans laquelle la séparation spatiale entre la première et la deuxième parois au niveau de leur bords inférieurs respectifs est suffisante pour que la barrière soit adaptée pour contenir un mécanisme de commande d'une porte coulissante.
4. Barrière destinée à un quai de gare selon l'une quelconque des revendications 1 à 3, dans laquelle la barrière est adaptée pour accueillir une porte coulissante.
5. Barrière destinée à un quai de gare selon l'une quelconque des revendications 1 à 4, dans laquelle la partie inférieure de la première surface de paroi est inclinée à un angle qui s'écarte du plan de la surface du restant de la paroi de manière à tenir les passagers à l'écart du bord du quai.
6. Barrière destinée à un quai de gare selon l'une quelconque des revendications 1 à 5, dans laquelle la barrière a une hauteur comprise entre 1100 et 1500 mm mesurée à partir de la surface du quai.
7. Porte pour un système de barrière destiné à un quai de gare selon l'une quelconque des revendications 1 à 6, dans laquelle en position installée la porte est incurvée à l'opposé du bord du quai.

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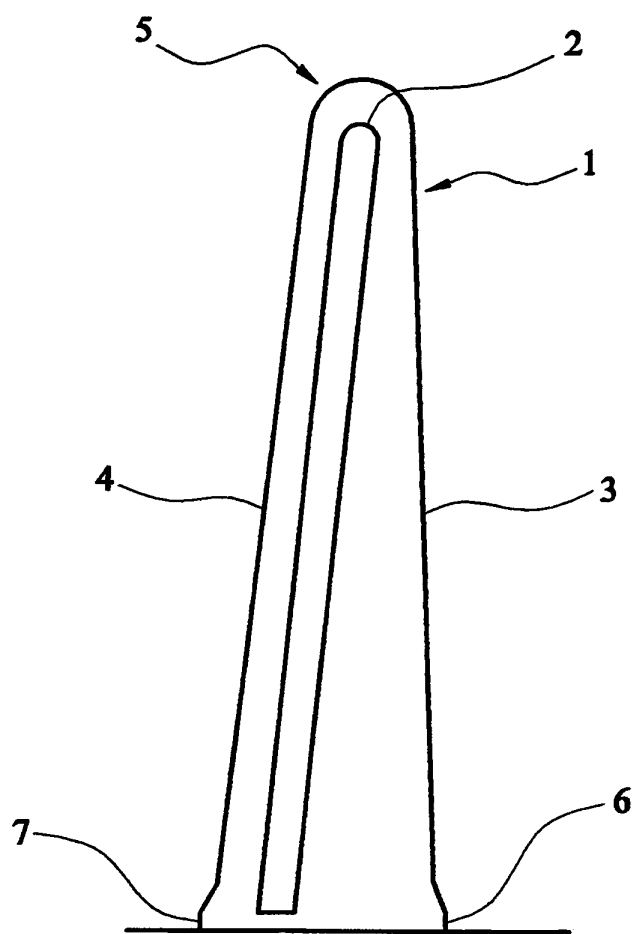
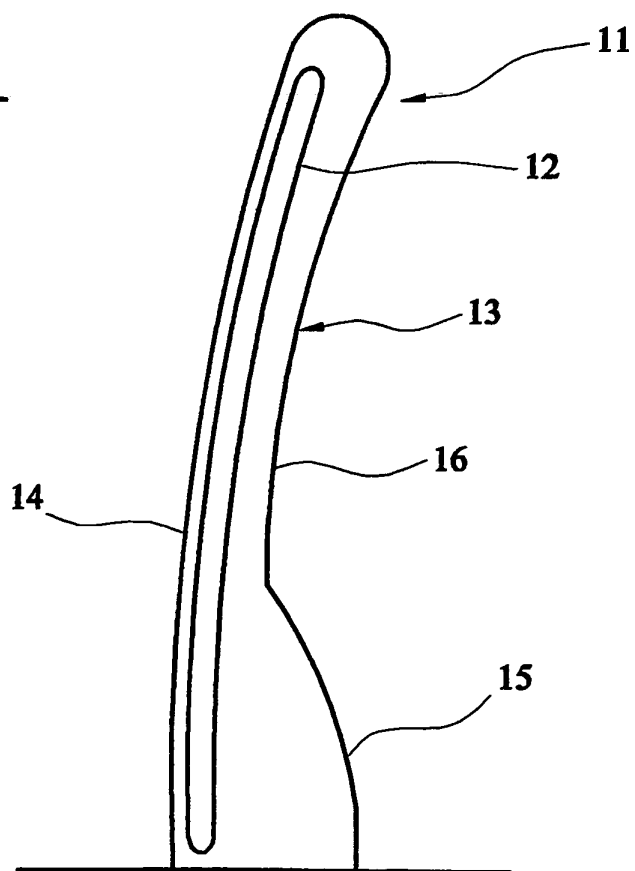


FIG. 1

FIG. 2



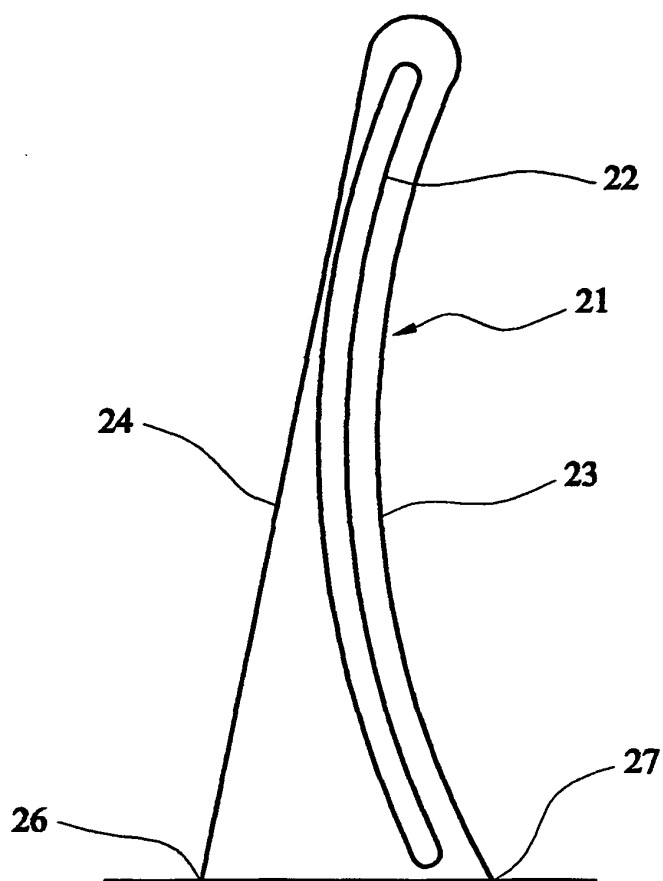
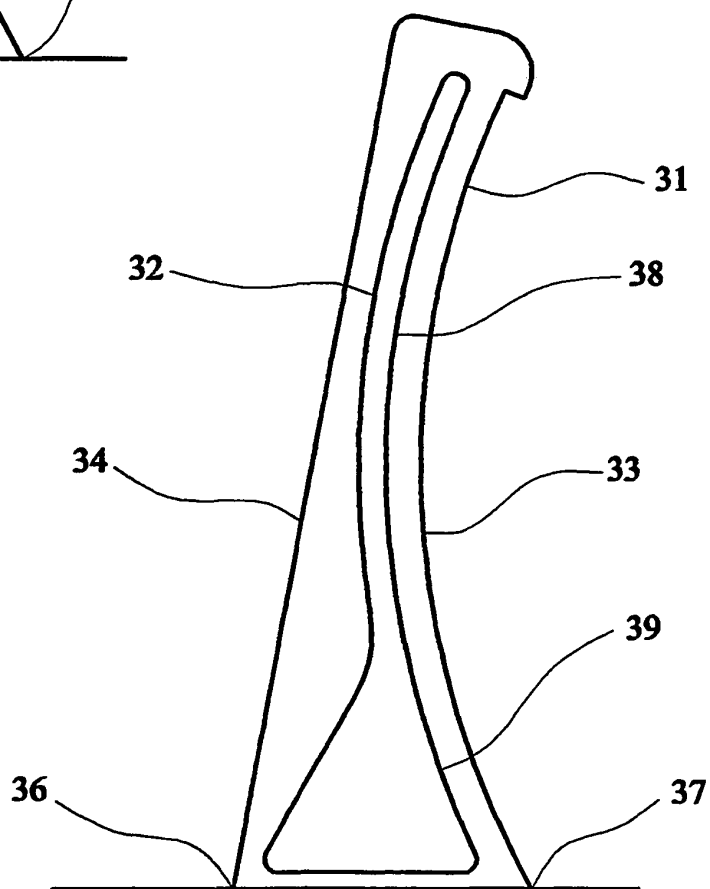


FIG. 3

FIG. 4



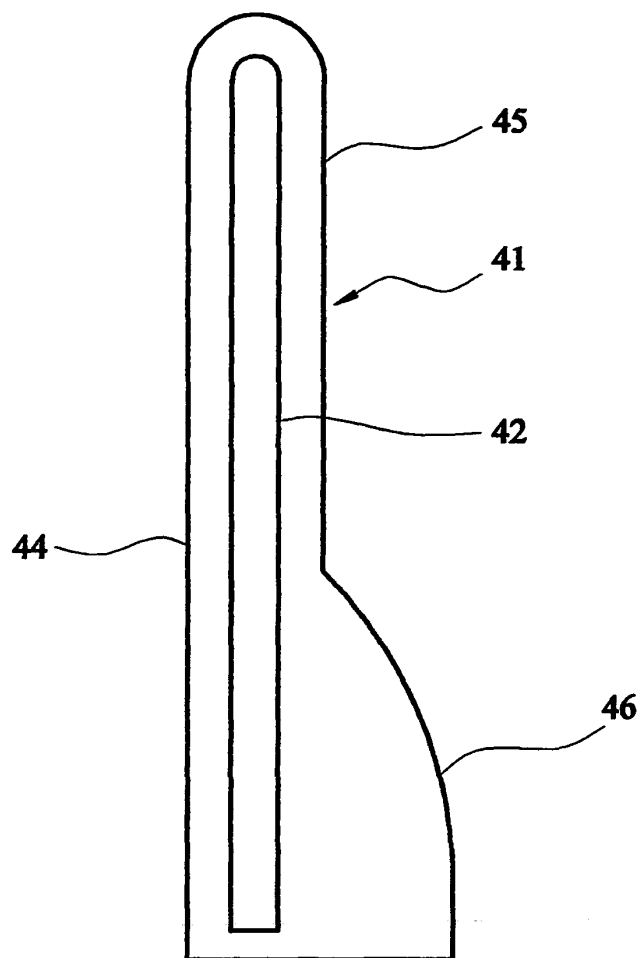
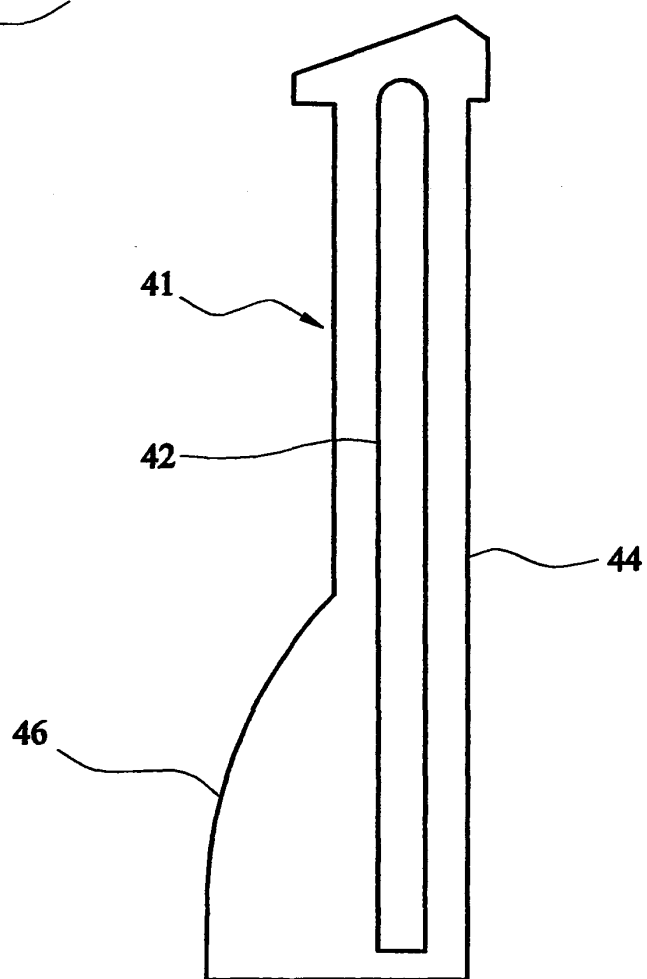


FIG. 5

FIG. 6



REFERENCES CITED IN THE DESCRIPTION

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