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(54) **Mechanical prevention apparatus for an emergency exit door**

Mechanische Sperre der Türklinke einer Notausgangstür

Appareil de prévention mécanique pour porte de sortie de secours

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Description

Field of invention

[0001] The invention relates to a mechanical prevention apparatus designed to be installed to the door of an emergency exit to prevent rotating the lever handle of the lock in normal conditions. In case of emergency the prevention apparatus can be broken in order to be able to use the emergency exit.

Background art

[0002] A mechanical prevention apparatus for the lever handle is known from documents DE 81 18 314 U1, CH 90 452 A, DE 38 18 538 A1 and GB 2 445 949 A.

[0003] It is known to provide the door of an emergency exit with a mechanical prevention apparatus for preventing the rotating the lever handle of the lock and thus the opening of the door. Thus, the emergency exit provided with the prevention apparatus is always closed in normal condition, but it can be quickly opened in an emergency. Thereby the user must break the mechanical prevention apparatus in order to be able to use the lever handle.

[0004] It is known to attach the mechanical prevention apparatus to a door and it covers the lever handle. Thereby the dome covering the lever handle must be broken before the lever handle can be rotated. In practice at least three movements are needed for opening the door: breaking the dome, moving the broken dome away and rotating the lever handle. Such a prevention apparatus must be totally replaced in case of vandalism, whereby the attachment to the door can loosen, especially if vandalism is a recurring occurrence. Installing a new dome instead of the broken one requires tools. The door can also be scratched.

[0005] Another known way is to use a plastic binder loop screwed to both the door and the end of the lever handle. In an emergency the loop of the plastic binder must be removed by hand if the strength of the user is not sufficient to break the plastic binder by rotating the lever handle. The embodiment is not aesthetic and the lever handle must in practice be provided with a hole for fastening the plastic binder loop. The operation is unreliable, especially when the users are children and elderly. The door can easily be scratched.

[0006] The usability of the above-mentioned embodiments is not very good, as their use in practice requires a number of movements for opening the door and they can't be installed in, for example, a glass profile door. More complex mechanical prevention apparatuses are also known, such as an apparatus provided with a seal and a separate signalling system for monitoring the state of the emergency exits.

Brief description of the invention

[0007] The purpose of the invention is to eliminate the

above-mentioned problems. The purpose is achieved as disclosed in claim 1. Other claims describe the various embodiments of the invention.

[0008] The mechanical prevention apparatus according to the invention comprises a body part 10, 10A and a replacement part 20, 20A, 20B. The body part can be fastened to the door and the replacement part can be fastened to the body part. The replacement part comprises a prevention surface 3 for preventing the rotation of the lever handle. The prevention apparatus comprises at least one portion of weakness 40, 40A, 40B, at which the replacement part is broken, when necessary. In normal use the prevention apparatus provides sufficient prevention for rotation of the lever handle. In an emergency the mechanical prevention apparatus of the emergency exit can be used with one movement and the apparatus operates reliably. A broken prevention apparatus can easily be replaced without leaving marks on the door. The prevention apparatus is further suitable for all kinds of doors. It is not necessary to modify the lever handle for the mechanical prevention apparatus.

List of figures

[0009] In the following the invention is described in more detail by reference to the appended figures, in which

Figure 1	illustrates an example of the inventive prevention apparatus installed,
Figures 2A-2D	illustrate an embodiment of the replacement part of the inventive prevention apparatus,
Figure 3	illustrates another embodiment of the replacement part,
Figure 4A - 4C	illustrate yet another embodiment of the replacement part,
Figure 5A - 5D	illustrate another embodiment of the body part and
Figure 6	illustrates another embodiment of the body part.

Description of the invention

[0010]

Figure 1 illustrates a prevention apparatus according to the invention installed in the door of an emergency exit. The prevention apparatus comprises a body part 10 attachable to the door and a replacement part 20A attachable to the body part. The replacement part comprises a prevention surface 3 that during installation prevents rotation of the lever handle 12 in normal situations. The mechanical prevention apparatus is well accessible, so the user sees that the door is one meant only for emergency exits and the lever handle is not supposed to be used in a normal situation. In an emergency the mechanical

prevention apparatus, however, yields so that the lever handle can be used. In this embodiment this is arranged so that the replacement part 20A comprises two portions of weakness 40, 40A at which the replacement part breaks when the lever handle is rotated strongly enough. Breaking of the replacement part means at least bending of the replacement part at the portion of weakness 40 so that the lever handle 12 rotates sufficiently for opening the door. Thus, the replacement part of the embodiment of figure 1 bends at two places, if necessary.

Figures 2A and 2D illustrate an embodiment of the replacement part having at least one portion of weakness 40 at which the replacement part breaks, when necessary. Figure 3 illustrates the replacement part of figure 1, the part being bent to a z-shaped curve when the lever handle is rotated with sufficient strength.

[0011] Preferably the body part 10 and the replacement part 20, 20A comprise quick attachment elements 50, 60 for fastening the parts to each other. The replacement part 20A of such an embodiment is described in figures 2A - 2D and the body part 10 is illustrated in figures 5A - 5D. The quick attachment is preferable, as the installation of the replacement part to the body part is very easy and fast. A separate tool is not needed. In case the replacement part is broken due to vandalism, there is no need to replace the whole prevention apparatus and there is no need to make a new attachment to the door. Thus, no marks are made to the door when the broken replacement part is replaced with a new replacement part. It is, however, of course possible to fasten the replacement part by means of a screw to the body part.

[0012] It is also possible to arrange the portion of weakness 40B in connection with the quick attachment of the replacement part. Figures 4A - 4C illustrate such an embodiment. In this case the replacement part 20B breaks at the portion of weakness 40B of the quick attachment. Figure 6 illustrates a body part for such an embodiment, the figures showing the corresponding quick attachment design 50A of the body part 10A. The quick attachment dowel can be a common part of the replacement part or it can be a separate replaceable part.

[0013] The replacement part 20, 20A, 20B is a plate parallel with the surface of the emergency exit door. In some embodiments at least one portion of weakness 40, 40A is mentioned in the plate at which the plate is broken when the lever handle is rotated with sufficient strength. The strength needed for rotation of the lever handle can be dimensioned suitably so that even children and the elderly can in an emergency rotate the lever handle with one hand. One movement with one hand is sufficient to open the emergency exit.

[0014] Preferably the plate also comprises an extension 7 forming the said prevention surface 3. The extension allows also producing torque so that the plate is more

easily broken at the portion of weakness. As can be seen in the figures, the extension is on the opposite side of the plate in relation to the portion of weakness. During installation, the prevention surface formed by the extension is against the lever handle 12. It is also possible to produce the plate so that the prevention surface is, for example, directly at the end of it, but in this case the portion of weakness must be made deeper and possibly differently from the embodiments shown in the figures.

[0015] In an embodiment according to the invention (shown in figures) the plate 2 comprises also an attention part 8 parallel with the plate on the other side of the extension 7 seen from the portion of weakness. The attention part can comprise a back-up portion of weakness 9 so that the attention part bends as the lever handle is rotated. Thus, the back-up portion of weakness ensures that the lever handle can be rotated in an emergency. The attention part is visibly in front of the lever handle whereby it indicates that the door is not meant for normal use. The plate can also comprise an informative text, such as "FIRE EXIT". The portions of weakness shown in the figures can be realized so that they are grooves.

[0016] The embodiment of the body part shown in figures comprises a shaft having a curve. During installation the other side 110 of the shaft faces the surface of the door and the other side 110A) is parallel with the handle part of the lever handle 12. The curved shaft according to the embodiment allows the attachment point of the body part to be arranged vertically parallel with the axis of rotation of the lever handle. This means that the mechanical prevention apparatus is also suitable for installation in a glass profile door. By a glass profile door we mean a door being a glass but the borders thereof being, for example, metal profile. The other side of the body part, on the other hand, offers an attachment point for the replacement part 20, 20A, 20B under the lever handle, as can be seen in figure 1. The body part can be, for example, attached by screws to the door. The body part can, however, be realized in another way, such as having a straight shaft below the lever handle.

[0017] The body part and the replacement part can also be made of plastic. Other material, such as metal suitable for the purpose, can also be used.

[0018] On the basis of the above it is evident that the invention is not limited to the embodiments disclosed here, but it can be carried out in a number of different other embodiments within the inventive idea.

Claims

1. A mechanical prevention apparatus for the lever handle (12) of an emergency exit door, the apparatus being attachable to the door so that it prevents rotation of the lever handle, the prevention apparatus being breakable when needed,
characterized in that the mechanical prevention apparatus comprises a body part (10, 10A) and a

replacement part (20, 20A, 20B), the body part being attachable to the door and the replacement part being attachable to the body part, the replacement part comprising a prevention surface (3) for preventing rotation of the lever handle and the prevention apparatus comprising at least one portion of weakness (40, 40A, 40B) at which the prevention apparatus breaks, when necessary, the portion of weakness (40, 40A, 40B) being in the replacement part, the replacement part (20, 20A, 20B) being a plate parallel with the surface of the emergency exit door when installed, the plate comprising at least one portion of weakness (40, 40A, 40B) at which the plate breaks when the lever handle is rotated.

2. A prevention apparatus according to claim 1, **characterized in that** the plate comprises an extension (7) forming the prevention surface (3).
3. A prevention apparatus according to claim 2, **characterized in that** the plate (20, 20A, 20B) comprises an attention part (8) parallel with the plate and located on the other side of the extension seen from the portion of weakness (40).
4. A prevention apparatus according to claim 3, **characterized in that** the attention part comprises a back-up portion of weakness (9) so that the attention part bends when the lever handle is rotated.
5. A prevention apparatus according to claim 3 or 4, **characterized in that** the said portions of weakness are grooves.
6. A prevention apparatus according to claim 2, 3, 4 or 5, **characterized in that** the body part (10, 10A) comprises a shaft having a curve, one side (110) of the shaft facing the surface of the door during installation and the other side (110A) being parallel with the handle part of the lever handle.
7. A prevention apparatus according to claim 6, **characterized in that** the body part can be fastened to the door by screws.
8. A prevention apparatus according to claim 6, **characterized in that** the body part (10, 10A) and the replacement part (20, 20A, 20B) are made of plastic.
9. A prevention apparatus according to any of claims 1 - 8, **characterized in that** the body part (10, 10A) and the replacement part (20, 20A, 20B) comprise quick attachment elements (50, 50A, 60, 60A) for attaching the parts to each other.
10. A prevention apparatus according to claim 9, **characterized in that** the quick attachment element of the replacement part (60A) comprises the said por-

tion of weakness (40B).

11. A prevention apparatus according to any of claims 1 - 8, **characterized in that** it additionally comprises a separate attachment means for attaching the body part and the replacement part to each other.
12. A prevention apparatus according to claim 11, **characterized in that** the attachment means comprises the said portion of weakness.

Patentansprüche

1. Mechanische Verhinderungsvorrichtung für den Türdrücker (12) einer Notausgangstür, wobei die Vorrichtung an der Tür befestigbar ist, derart, dass sie eine Drehung des Türdrückers verhindert, wobei die Verhinderungsvorrichtung im Bedarfsfall zerbrochen werden kann, **dadurch gekennzeichnet, dass** die mechanische Verhinderungsvorrichtung einen Körperteil (10, 10A) und einen Austauschteil (20, 20A, 20B) umfasst, wobei der Körperteil an der Tür befestigbar ist und der Austauschteil an dem Körperteil befestigbar ist, wobei der Austauschteil eine Verhinderungsfläche (3) zum Verhindern einer Drehung des Türdrückers umfasst und die Verhinderungsvorrichtung mindestens eine Schwachstelle (40, 40A, 40B) umfasst, an der die Verhinderungsvorrichtung bei Bedarf bricht, wobei die Schwachstelle (40, 40A, 40B) in dem Austauschteil vorgesehen ist, wobei der Austauschteil (20, 20A, 20B) eine Platte ist, die im montierten Zustand parallel zu der Oberfläche der Notausgangstür verläuft, wobei die Platte mindestens eine Schwachstelle (40, 40A, 40B) umfasst, an der die Platte bricht, wenn der Türdrücker gedreht wird.
2. Verhinderungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Platte einen Fortsatz (7) umfasst, der die Verhinderungsfläche (3) bildet.
3. Verhinderungsvorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Platte (20, 20A, 20B) einen Hinweisteil (8) umfasst, der parallel zu der Platte verläuft und von der Schwachstelle (40) aus gesehen auf der dem Fortsatz entgegengesetzten Seite angeordnet ist.
4. Verhinderungsvorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** der Hinweisteil eine Reserveschwachstelle (9) umfasst, so dass sich der Hinweisteil biegt, wenn der Türdrücker gedreht wird.
5. Verhinderungsvorrichtung nach Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** die Schwachstellen Rillen sind.

6. Verhinderungsvorrichtung nach Anspruch 2, 3, 4 oder 5, **dadurch gekennzeichnet, dass** der Körperteil (10, 10A) einen Schaft umfasst, der eine Krümmung aufweist, wobei eine Seite (110) des Schafts während der Montage der Oberfläche der Tür zugewandt und die andere Seite (110A) parallel zu dem Griffteil des Türdrückers ist. 5
7. Verhinderungsvorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** der Körperteil mittels Schrauben an der Tür befestigt sein kann. 10
8. Verhinderungsvorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** der Körperteil (10, 10A) und der Austauschteil (20, 20A, 20B) aus Kunststoff hergestellt sind. 15
9. Verhinderungsvorrichtung nach einem beliebigen der Ansprüche 1 - 8, **dadurch gekennzeichnet, dass** der Körperteil (10, 10A) und der Austauschteil (20, 20A, 20B) Schnellbefestigungselemente (50, 50A, 60, 60A) zum Befestigen der Teile aneinander umfassen. 20
10. Verhinderungsvorrichtung nach Anspruch 9, **dadurch gekennzeichnet, dass** das Schnellbefestigungselement des Austauschteils (60A) die Schwachstelle (40B) umfasst. 25
11. Verhinderungsvorrichtung nach einem beliebigen der Ansprüche 1 - 8, **dadurch gekennzeichnet, dass** sie darüber hinaus ein gesondertes Befestigungsmittel zum Befestigen des Körperteils und des Austauschteils aneinander umfasst. 30
12. Verhinderungsvorrichtung nach Anspruch 11, **dadurch gekennzeichnet, dass** das Befestigungsmittel die Schwachstelle umfasst. 35

Revendications

1. Appareil de prévention mécanique pour la poignée de levier (12) d'une porte de sortie d'urgence, l'appareil pouvant être attaché à la porte de manière à empêcher la rotation de la poignée de levier, l'appareil de prévention étant cassable lorsque cela est nécessaire, **caractérisé en ce que** l'appareil de prévention mécanique comprend une partie de corps (10, 10A) et une partie de remplacement (20, 20A, 20B), la partie de corps pouvant être attachée à la porte et la partie de remplacement pouvant être attachée à la partie de corps, la partie de remplacement comprenant une surface de prévention (3) pour empêcher la rotation de la poignée de levier et l'appareil de prévention comprenant au moins une portion de faiblesse (40, 40A, 40B) à laquelle l'appareil de prévention se cas-

se, lorsque cela est nécessaire, la portion de faiblesse (40, 40A, 40B) étant dans la partie de remplacement, la partie de remplacement (20, 20A, 20B) étant une plaque parallèle à la surface de la porte de sortie d'urgence lorsqu'elle est installée, la plaque comprenant au moins une portion de faiblesse (40, 40A, 40B) à laquelle la plaque se casse lorsque la poignée de levier est tournée.

2. Appareil de prévention selon la revendication 1, **caractérisé en ce que** la plaque comprend une extension (7) formant la surface de prévention (3).
3. Appareil de prévention selon la revendication 2, **caractérisé en ce que** la plaque (20, 20A, 20B) comprend une partie d'attention (8) parallèle à la plaque et située de l'autre côté de l'extension en vue de la portion de faiblesse (40).
4. Appareil de prévention selon la revendication 3, **caractérisé en ce que** la partie d'attention comprend une portion de secours de faiblesse (9) de sorte que la partie d'attention se plie lorsque la poignée de levier est tournée.
5. Appareil de prévention selon la revendication 3 or 4, **caractérisé en ce que** lesdites portions de faiblesse sont des gorges.
6. Appareil de prévention selon la revendication 2, 3, 4 ou 5, **caractérisé en ce que** la partie de corps (10, 10A) comprend un arbre ayant une courbe, un côté (110) de l'arbre faisant face à la surface de la porte pendant l'installation et l'autre côté (110A) étant parallèle à la partie de poignée de la poignée de levier.
7. Appareil de prévention selon la revendication 6, **caractérisé en ce que** la partie de corps est serrée sur la porte par des vis.
8. Appareil de prévention selon la revendication 6, **caractérisé en ce que** la partie de corps (10, 10A) et la partie de remplacement (20, 20A, 20B) sont en plastique.
9. Appareil de prévention selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** la partie de corps (10, 10A) et la partie de remplacement (20, 20A, 20B) comprennent des éléments d'attache rapide (50, 50A, 60, 60A) pour attacher les parties l'une à l'autre.
10. Appareil de prévention selon la revendication 9, **caractérisé en ce que** l'élément d'attache rapide de la partie de remplacement (60A) comprend ladite portion de faiblesse (40B).

11. Appareil de prévention selon l'une quelconque des revendications 1 à 8, **caractérisé en ce qu'**il comprend en outre un moyen d'attache distinct pour attacher la partie de corps et la partie de remplacement l'une à l'autre.

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12. Appareil de prévention selon la revendication 11, **caractérisé en ce que** le moyen d'attache comprend ladite portion de faiblesse.

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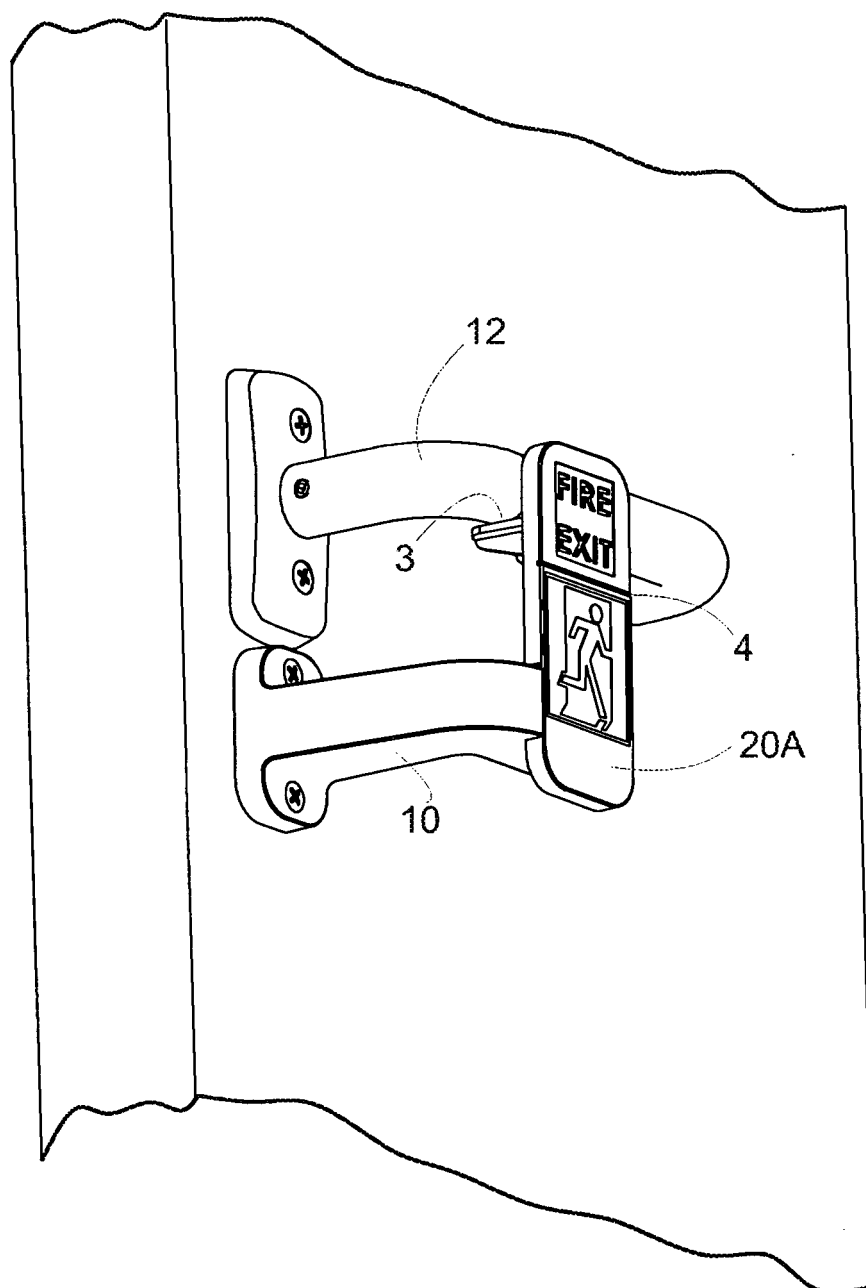


FIG. 1

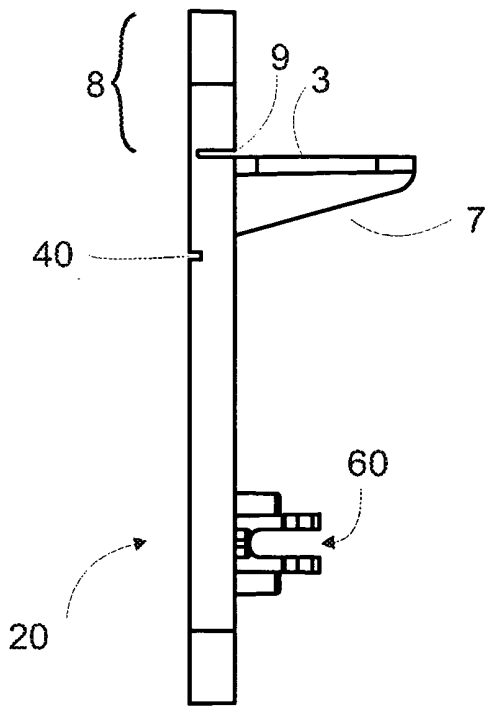


FIG. 2A

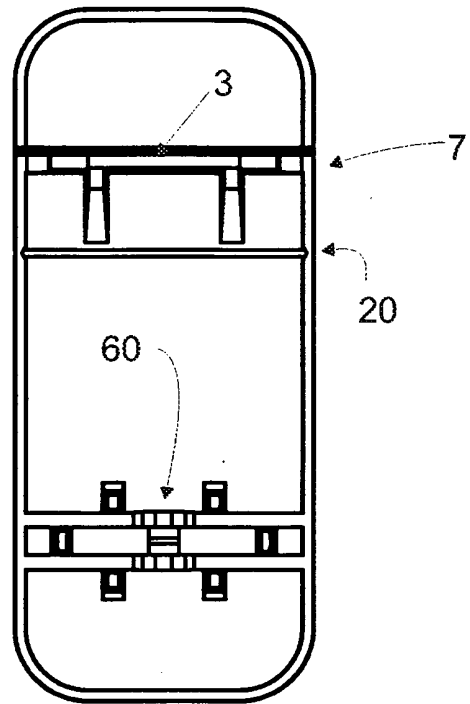


FIG. 2B

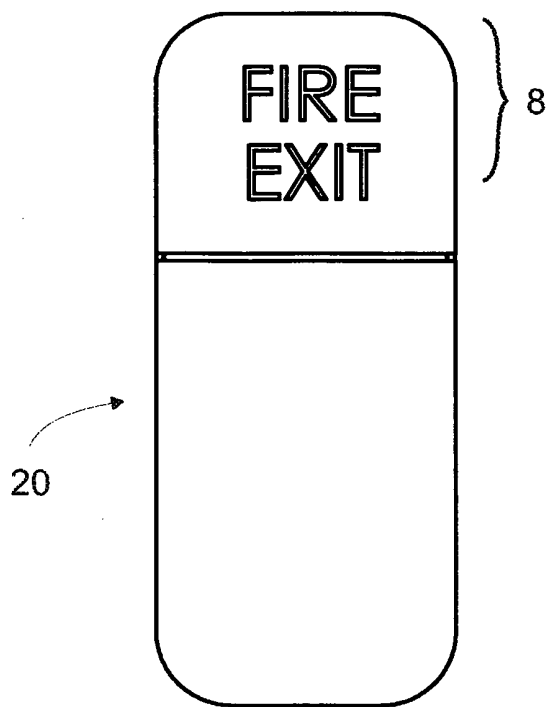


FIG. 2C

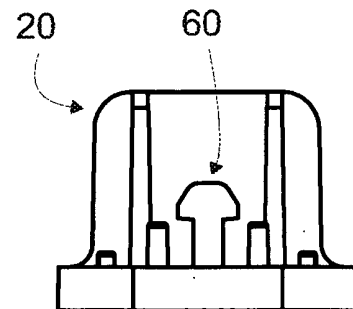
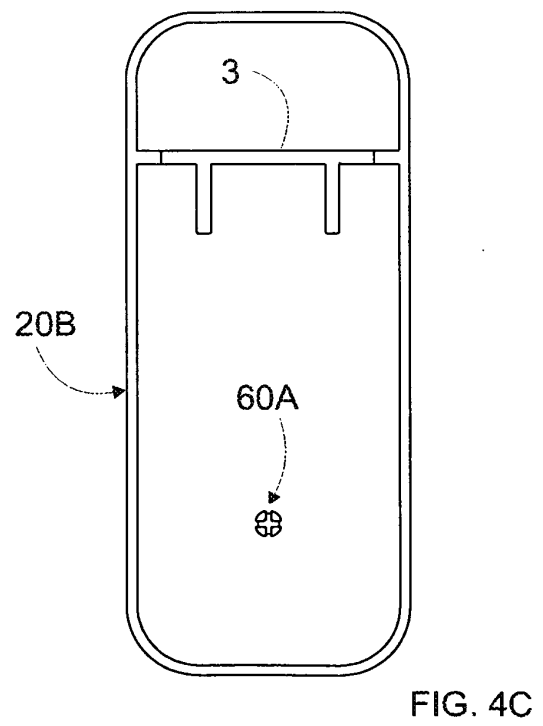
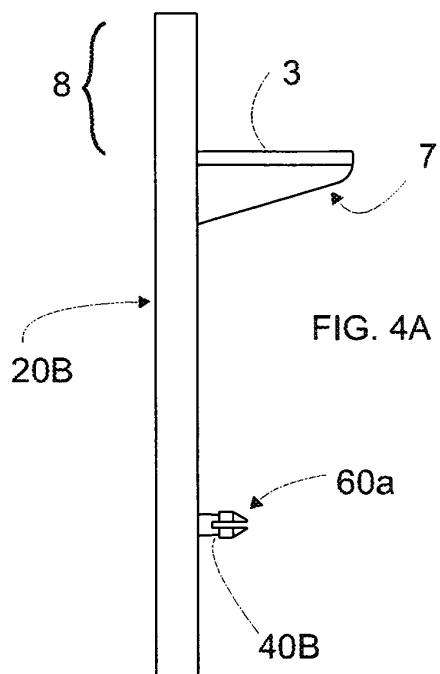
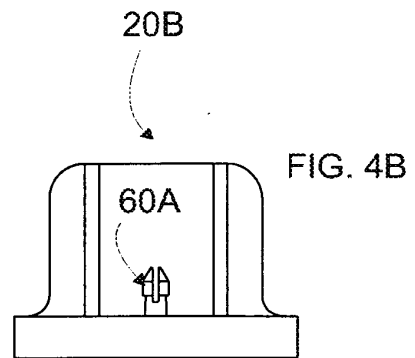
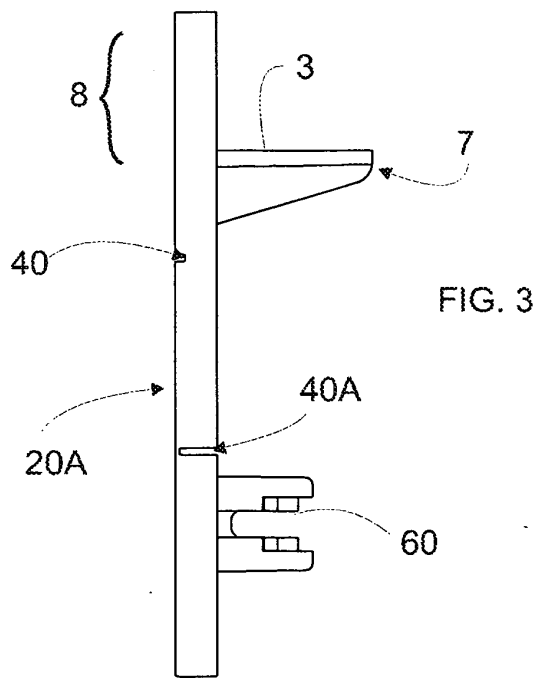
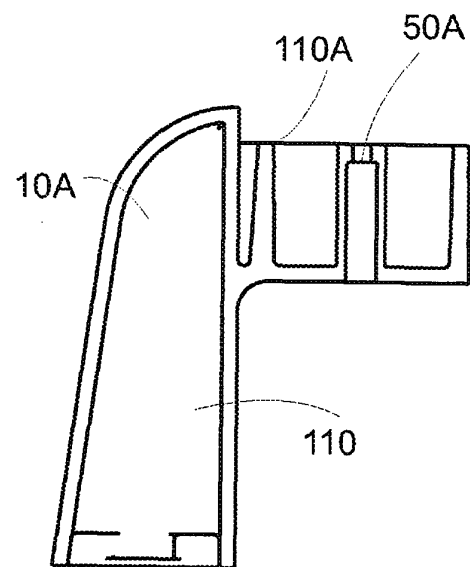
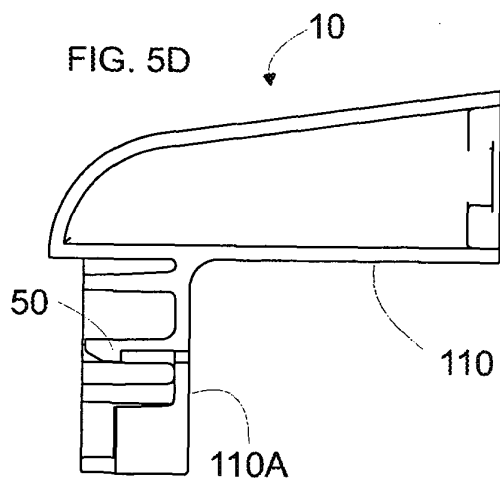
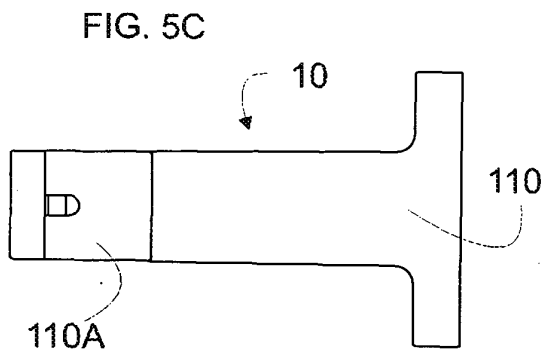
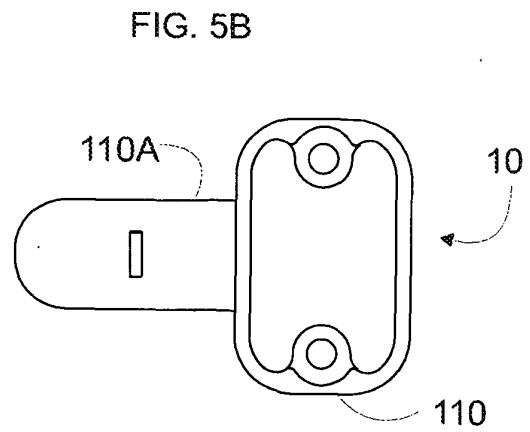
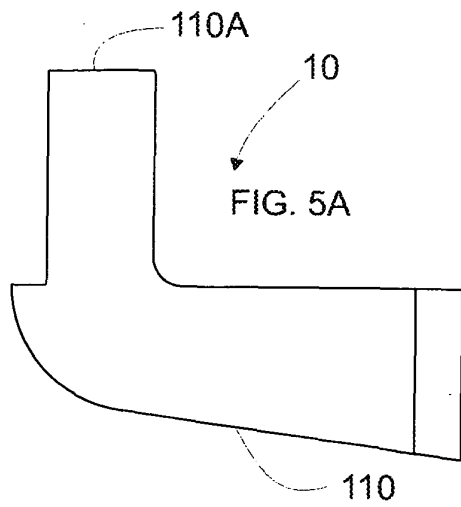


FIG. 2D





REFERENCES CITED IN THE DESCRIPTION

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