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(54) **Ramp step assembly**

Rampe oder Treppevorrichtung

Dispositif d'escalier ou rampe

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EP 0 976 376 B1

Description

[0001] The invention relates to access apparatus and particularly, though not exclusively, to access apparatus to facilitate movement in and out of ambulances.

[0002] It is known to provide an access structure, such as an ambulance, with access apparatus which includes both a ramp and a step. EP 0 901 893 A2 for example, discloses a ramp having a detachable extension member which may also be used as a step. GB 2 306 436A according to the first part of claim 1 discloses a retractable ramp which can be used with a vehicle having a drop down step.

[0003] However the known combinations of step and ramp are not ideal. EP 0 901 893 A2 requires the extension member/step to be stored separately from the rest of the ramp and thus does not allow for particularly convenient use of the step. GB 2 306 436A requires the ramp to be stored behind the step and it is therefore necessary to first open out the step before using the ramp which again is not particularly convenient.

[0004] The invention solves the problem of delay and inconvenience by providing a single assembly which comprises both a step and a ramp wherein each may be used conveniently and without the need to first move the other.

[0005] According to the invention, there is provided an access apparatus comprising an assembly movable between a first, closed configuration, a second, access configuration in which a step is accessible to persons on foot and a third, access configuration in which a ramp is accessible to receive wheeled transport characterised in that the step is housed within the ramp.

[0006] When the access apparatus is incorporated in an ambulance, for example, it enables ambulance personnel to gain access to the interior of the ambulance on foot, as necessary, using the second configuration. However in circumstances where it is necessary for the ambulance personnel to move wheeled transport into or out of the ambulance, for example to convey a patient on a wheeled trolley, then the assembly can be moved to the third, access configuration in which the ramp is accessible.

[0007] The step may be made accessible by pivoting the step from a closed position to an access position.

[0008] The step may pivot out of a step stowage space, the space being shaped such that when the step is in the access position, the step cooperates with the step stowage space to provide a double step.

[0009] The ramp may be made accessible by pivoting the ramp from a closed position to an access position.

[0010] The ramp may pivot out of a ramp stowage space, the ramp stowage space being shaped such that when the ramp is in the access position, the ramp cooperates with the ramp stowage space to provide a ramp surface of extended length.

[0011] The ramp may further comprise ramp extension means. The ramp extension means may be made accessible by pivoting the ramp extension means from a closed position to an access position.

[0012] The ramp extension means may pivot out of a ramp extension means stowage space.

[0013] The step and ramp may pivot about different pivot points.

[0014] The step may be housed within the ramp such that the step may be pivoted out of the ramp to the step access position when the ramp is in its closed position.

[0015] The movements of the step and ramp may be power operated, for example by means of a motor.

[0016] The motor may be electrically controlled.

[0017] The invention includes an access structure fitted with access apparatus according to the invention.

[0018] The access structure may comprise a vehicle.

[0019] The vehicle may comprise an ambulance.

[0020] One embodiment of access apparatus according to the invention will now be described with reference to the accompanying drawings, in which :-

Figure 1 is a perspective view of an embodiment of access apparatus according to the invention, for use at the rear of an ambulance, in a closed configuration;

Figure 2 is a view similar to Figure 1, but showing a lowered step of the access apparatus;

Figure 3 is a view similar to Figure 1, but showing a lowered ramp of the access apparatus;

Figure 4 is a view similar to Figure 1, but showing an intermediate stage in the lowering of the ramp;

Figure 5 is a side view showing the step and ramp pivot arrangements in more detail;

Figure 6 is a perspective view of an ambulance fitted with the embodiment of apparatus according to the invention; and

Figures 7a, 7b and 7c are side views showing various positions of a second embodiment of the access apparatus which includes an additional ramp extension means.

[0021] Figure 1 shows the rear floor area 10 of an ambulance.

[0022] In the closed configuration shown in Figure 1, access apparatus forming the subject of this embodiment provide a first surface 11 which is a continuation of the horizontal floor area 10, and a rear face 12 which is a continuation of the rear face 13 of the vehicle. Thus in this configuration doors (not shown) of the ambulance can be closed and the horizontal floor surface in the ambulance can be used normally for the transportation of patients (e.g. lying on a stretcher or trolley) and ambulance personnel.

[0023] When the ambulance is stationary, with the doors opened, ambulance personnel may need to exit or enter the ambulance rapidly from the rear of the vehicle, for example to carry medical equipment out of the ambulance or back into the ambulance.

[0024] To facilitate this, the access apparatus incorporates a step 14 (see Figure 2).

[0025] In the lower configuration, the step comprises a vertical section 15 and a horizontal section 16, suitably connected together by brackets 17.

[0026] The step pivots downwardly to reach the configuration shown in Figure 2 but in the stored configuration shown in Figure 1, the step lies between side frame members 18 and 19. The rectangular space between these frame members 18 and 19, which houses the step in the stored configuration, has its own horizontal section 20 and vertical section 21 such that when the step 14 is lowered, there is actually a double step giving easy access between ground level and the floor 10 of the ambulance.

[0027] In different circumstances, the ambulance personnel may wish to unload or load a patient trolley and the access apparatus of this embodiment is able to cope with this situation also.

[0028] Instead of lowering the step 14 by pivoting the step downwardly about its axis, a ramp section 22, which is also housed between the side frame members 18 and 19, can be pivoted downwardly into the position shown in Figure 3. An intermediate pivoting position is shown in Figure 4 and it can be seen from Figure 4 that as the ramp 22 pivots downwardly, the step 14 remains in position as of the ramp structure.

[0029] The area between the side frame members 18 and 19 which accommodates the ramp 22 has its own sloping surface 23 and the pivot of the ramp member 22 is positioned such that when the ramp is lowered into the configuration shown in Figure 3, the ramp 22 and surface 13 combine to provide a continuous sloping surface giving easy access from ground level to the ambulance floor 10.

[0030] The access apparatus described above can readily be incorporated into new ambulances during manufacture or alternatively it can be fitted subsequently to existing ambulances.

[0031] Turning now to Figure 5, the pivot arrangements are shown in more detail. The step 14 and ramp 22 are shown in the stowed configuration in full lines and the ramp 22 is also shown in the lowered configuration in broken lines. The ramp pivots about a point 24 and the step pivots about a spaced apart point 25.

[0032] When the step 14 is not in use, it is locked in position by a manually operable catch 26.

[0033] Although the access apparatus has been specifically designed for use with ambulances, such as that shown at 27 in Figure 6, the access apparatus can be utilised in any situation where both step and ramp access is required. For example the apparatus could have useful applications in not only vehicles, but also in fixed structures such as nursing homes, hospitals, or domestic residences of wheel chair users. It may also have industrial applications, for example in factory storage areas where access may sometimes be required by personnel on foot, and sometimes by wheeled apparatus.

[0034] To allow for varying height differences between the upper floor 10 of the ambulance (or other fixed structure) and the lower ground floor 36, the access apparatus may comprise an additional ramp extension means 30 attached at pivot 32 as shown in Figures 7a to 7c.

[0035] In a closed configuration, the integrated ramp extension means 30 is locked in position by a manually operable catch 34. In this position, the ramp extension means 30 provides a first surface 11 which is a continuation of the horizontal floor 10. The ramp section 22 can be pivoted out of the closed configuration about pivot axis 24 shown in Figure 7b and, concurrently, the integrated ramp extension means is pivoted from the closed configuration outwardly about pivot axis 32 into the fully extended position where it makes contact with the ground 36 (Figure 7c).

[0036] In the fully extended configuration, the ramp extension means 30 provides a surface continuous with that of the main ramp section 22 so that wheeled vehicles may be transported up and down the ramp and ramp extension means smoothly.

[0037] The shape of the ramp may vary to suit the configuration of the particular vehicle to which it is fitted. For example, when viewed in plan, the ramp may be wider in the pivot area, rather than rectangular as shown in Figure 1.

[0038] Instead of using manual catches such as 26 and 34, all the motions and lock/unlock controls for the ramp and step may be operated electrically by switch means or remote control means, which may be hand held.

Claims

1. An access apparatus comprising an assembly, movable between a first, closed configuration, a second, access configuration in which a step (14) is accessible to persons on foot and a third, access configuration in which a ramp (22) is accessible to receive wheeled transport **characterised in that** the step (14) is housed within the ramp (22).

2. An access apparatus as claimed in Claim 1, wherein the step (14) is made accessible by pivoting the step (14) from a closed position to an access position.

3. An access apparatus as claimed in Claim 1 or 2, wherein the ramp (22) is made accessible by pivoting the ramp (22) from a closed position to an access position.

4. An access apparatus as claimed in any one of

Claims 1 to 3, wherein the ramp (22) comprises a ramp extension means (30).

5. An access apparatus as claimed in Claim 4, wherein the ramp extension means (30) is made accessible by pivoting the ramp extension means (30) from a closed position to an access position.

6. An access apparatus as claimed in any preceding Claim, wherein the step (14) and ramp (22) pivot about different pivot points (24,25).

7. An access apparatus as claimed in any preceding Claim, wherein the step (14) can be pivoted out of the ramp (22) to the step access position when the ramp (22) is in its closed position.

8. An access apparatus as claimed in any preceding Claim, wherein the movements of the step (14) and ramp (22) are power operated.

9. An access apparatus as claimed in Claim 1 in combination with an access structure suitable for fitting with access apparatus according to any preceding claim.

10. An access apparatus as claimed in Claim 9, wherein the access structure comprises an ambulance.

Patentansprüche

1. Zugangsvorrichtung mit einer Einheit, welche zwischen einer ersten, geschlossenen Anordnung, einer zweiten, freien Anordnung, in der eine Treppe (14) für Fußgänger zugänglich ist, und einer dritten, freien Anordnung beweglich ist, in der eine Rampe (22) für den Transport auf Rädern zugänglich ist, **dadurch gekennzeichnet, dass** die Treppe (14) innerhalb der Rampe (22) untergebracht ist.

2. Zugangsvorrichtung nach Anspruch 1, bei der die Stufe (14) durch Schwenken der Treppe (14) aus einer geschlossenen Position in eine freie Position zugänglich gemacht wird.

3. Zugangsvorrichtung nach den Ansprüchen 1 oder 2, bei der die Rampe (22) durch Schwenken der Rampe (22) aus einer geschlossenen Position in eine freie Position zugänglich gemacht wird.

4. Zugangsvorrichtung nach einem der Ansprüche 1 bis 3, bei der die Rampe (22) Rampenverlängerungsmittel (30) enthält.

5. Zugangsvorrichtung nach Anspruch 4, bei der die Rampenverlängerungsmittel (30) dadurch zugänglich gemacht werden, dass die Rampenverlängerungsmittel (30) aus einer geschlossenen Position in eine freie Position geschwenkt werden.

6. Zugangsvorrichtung nach einem der vorangehenden Ansprüche, bei der die Treppe (14) und die Rampe (22) um unterschiedliche Schwenkpunkte (24, 25) schwenken.

7. Zugangsvorrichtung nach einem der vorangehenden Ansprüche, bei der die Treppe (14) aus der Rampe (22) in die freie Trittposition geschwenkt werden kann, wenn sich die Rampe (22) in ihrer geschlossenen Position befindet.

8. Zugangsvorrichtung nach einem der vorangehenden Ansprüche, bei der die Bewegungen der Treppe (14) und der Rampe (22) motorbetrieben sind.

9. Zugangsvorrichtung nach Anspruch 1 in Kombination mit einem zugänglichen Gebilde, welches dazu geeignet ist, mit der Zugangsvorrichtung nach einem der vorangehenden Ansprüche ausgestattet zu sein.

10. Zugangsvorrichtung nach Anspruch 9, bei der das zugängliche Gebilde einen Krankenwagen darstellt.

Revendications

1. Appareil d'accès comprenant un ensemble, mobile entre une première configuration fermée, une seconde configuration d'accès dans laquelle une marche (14) est accessible aux personnes se déplaçant à pied et une troisième configuration d'accès dans laquelle une rampe (22) est accessible pour recevoir un moyen de transport sur roues, **caractérisé en ce que** la marche (14) est logée dans ladite rampe (22).

2. Appareil d'accès selon la revendication 1, dans lequel la marche (14) est rendue accessible en faisant pivoter la marche (14) depuis une position fermée vers une position d'accès.

3. Appareil d'accès selon la revendication 1 ou 2, dans lequel la rampe (22) est rendue accessible en faisant pivoter la rampe (22) depuis une position fermée jusqu'à une position d'accès.

4. Appareil d'accès selon l'une quelconque des revendications 1 à 3, dans lequel la rampe (22) comprend un moyen (30) de prolongation de la rampe.

5. Appareil d'accès selon la revendication 4, dans lequel le moyen (30) de prolongation de la rampe est rendu accessible en faisant pivoter le moyen (30)

de prolongation de la rampe depuis une position fermée vers une position d'accès.

6. Appareil d'accès selon l'une quelconque des revendications précédentes, dans lequel la marche (14) et la rampe (22) pivotent autour de différents points de pivot (24,25).

7. Appareil d'accès selon l'une quelconque des revendications précédentes, dans lequel la marche (14) peut pivoter hors de la rampe (22) vers la position d'accès de la marche lorsque la rampe (22) est en position fermée.

8. Appareil d'accès selon l'une quelconque des revendications précédentes, dans lequel les mouvements de la marche (14) et de la rampe (22) sont motorisés.

9. Appareil d'accès selon la revendication 1 en combinaison avec une structure d'accès convenant pour équiper l'appareil d'accès selon l'une quelconque des revendications précédentes.

10. Appareil d'accès selon la revendication 9, dans lequel la structure d'accès est constituée par une ambulance.

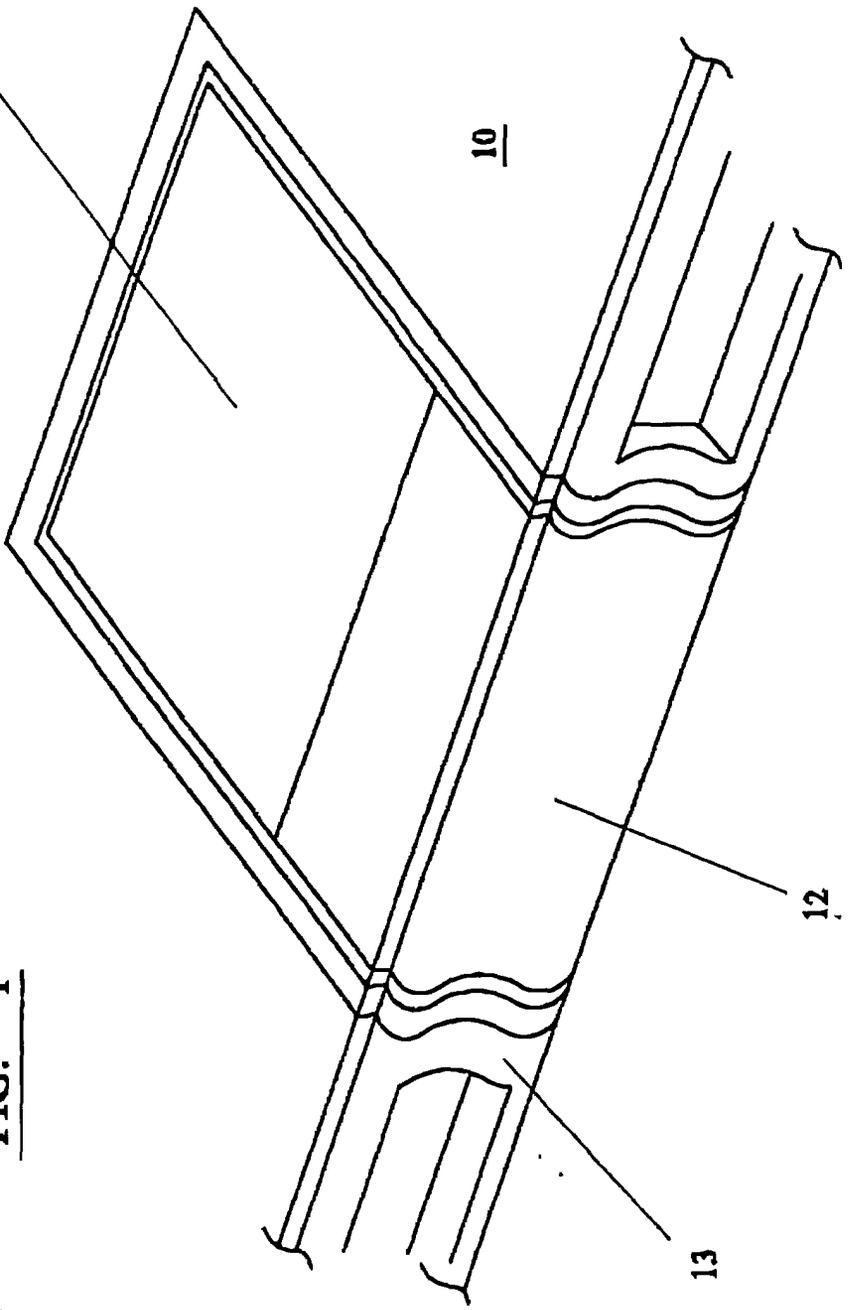


FIG. 1

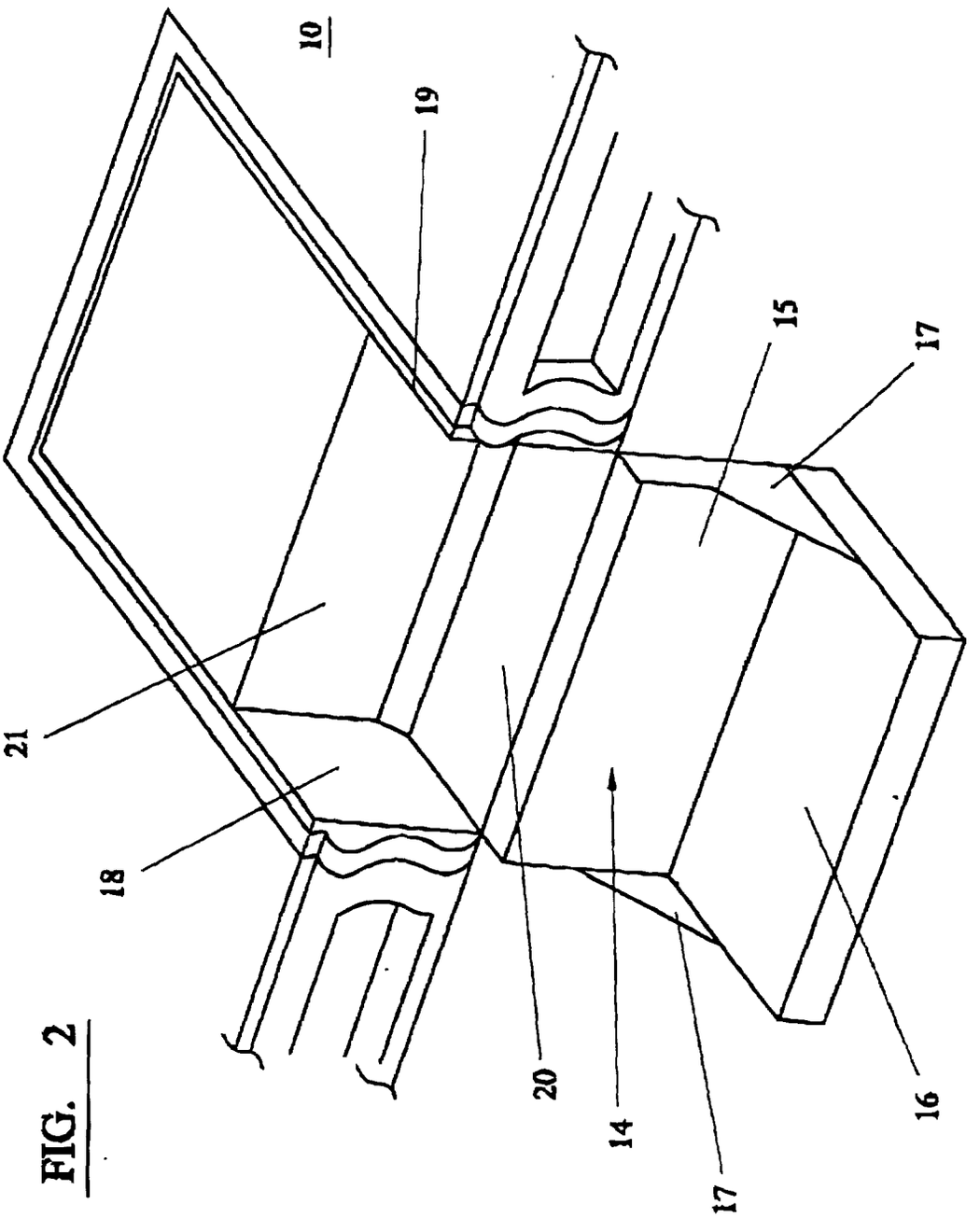


FIG. 2

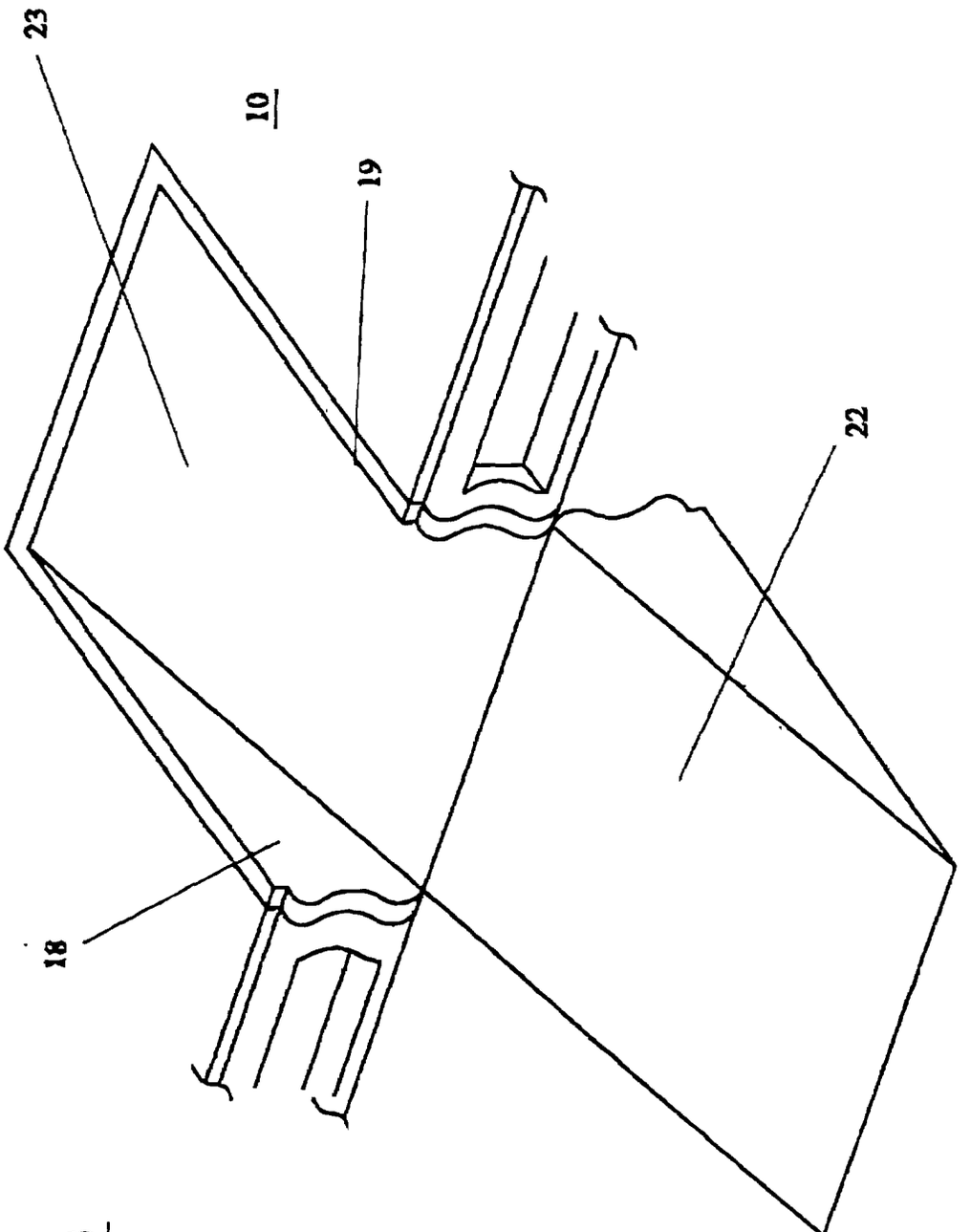
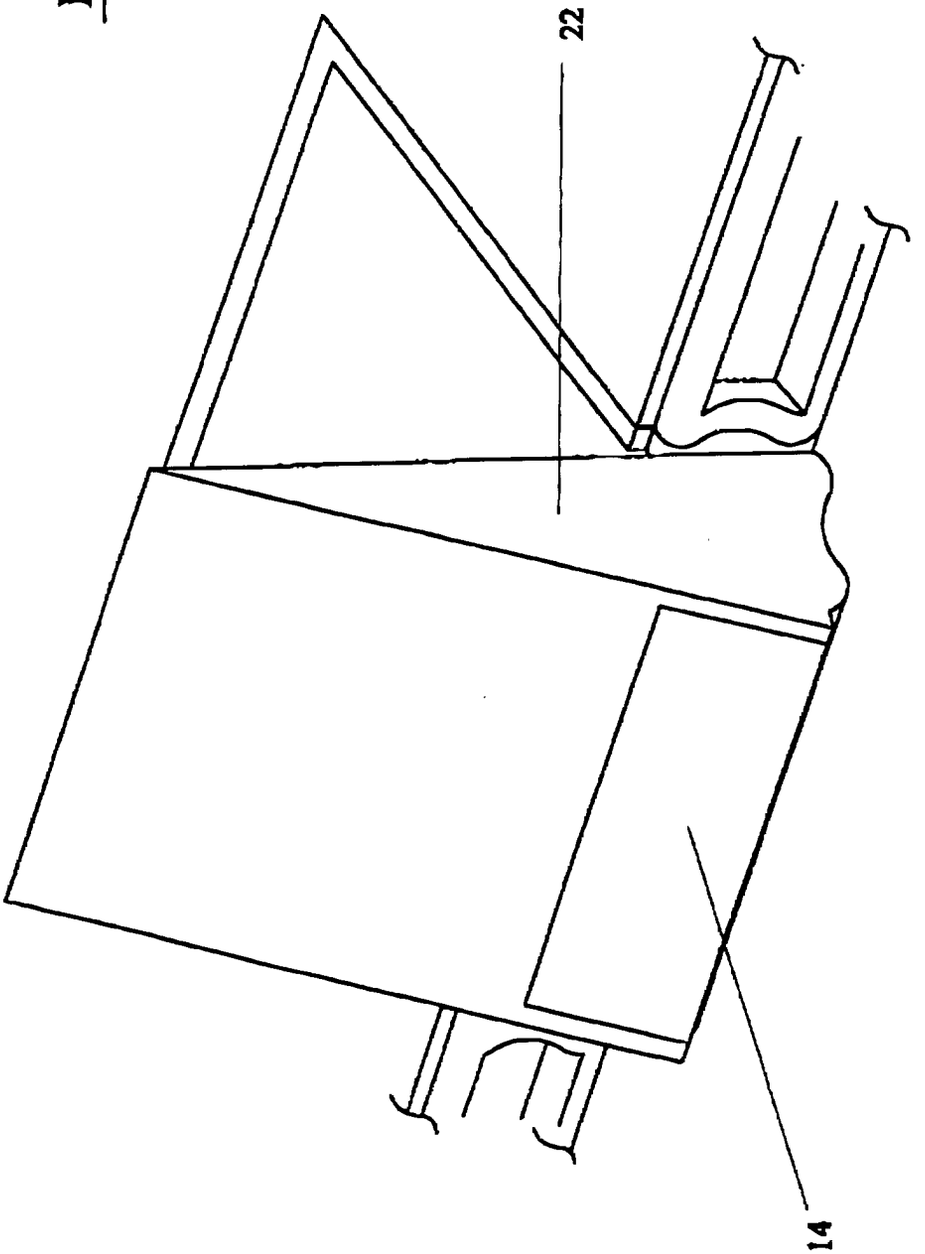


FIG. 3

FIG. 4



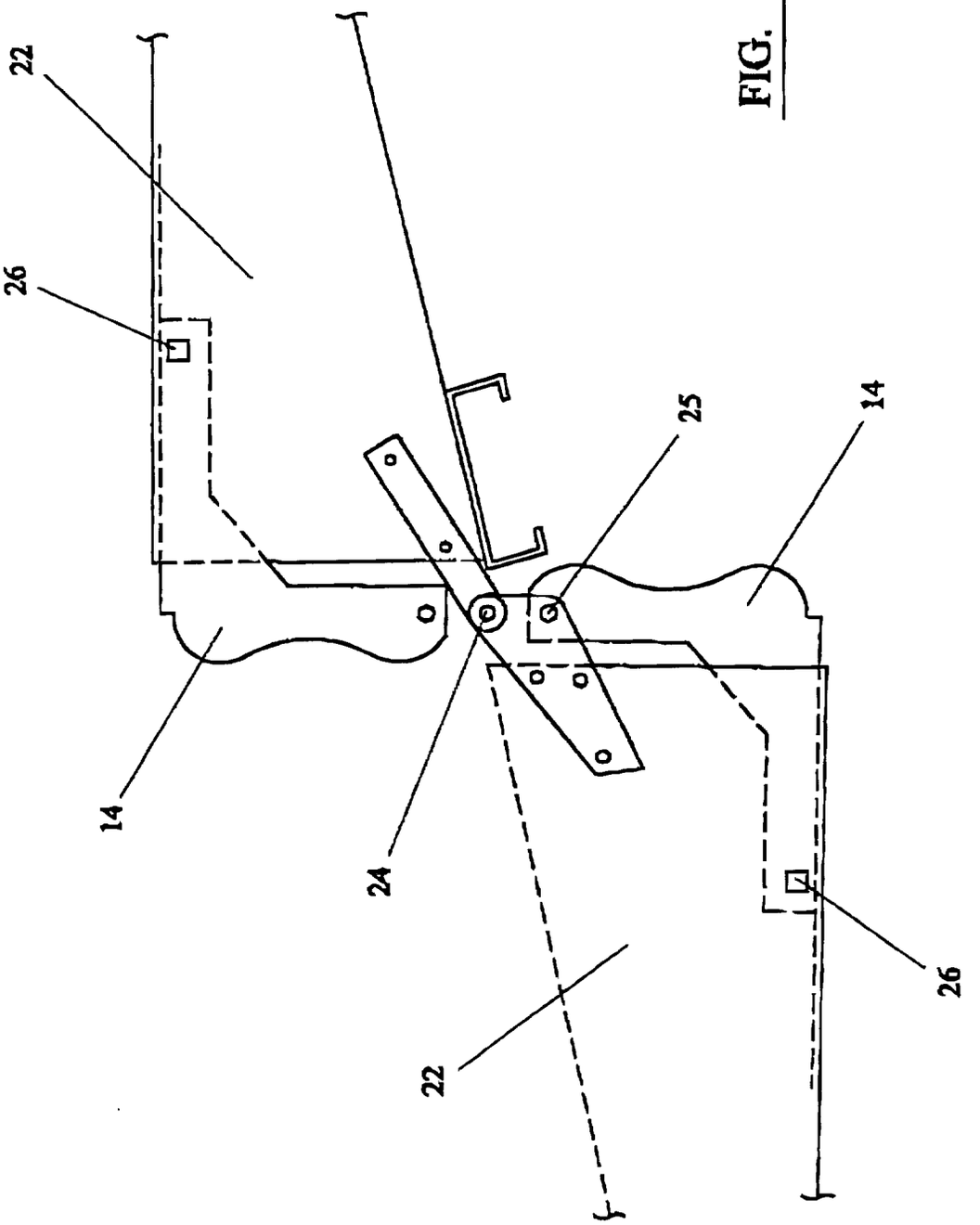


FIG. 5

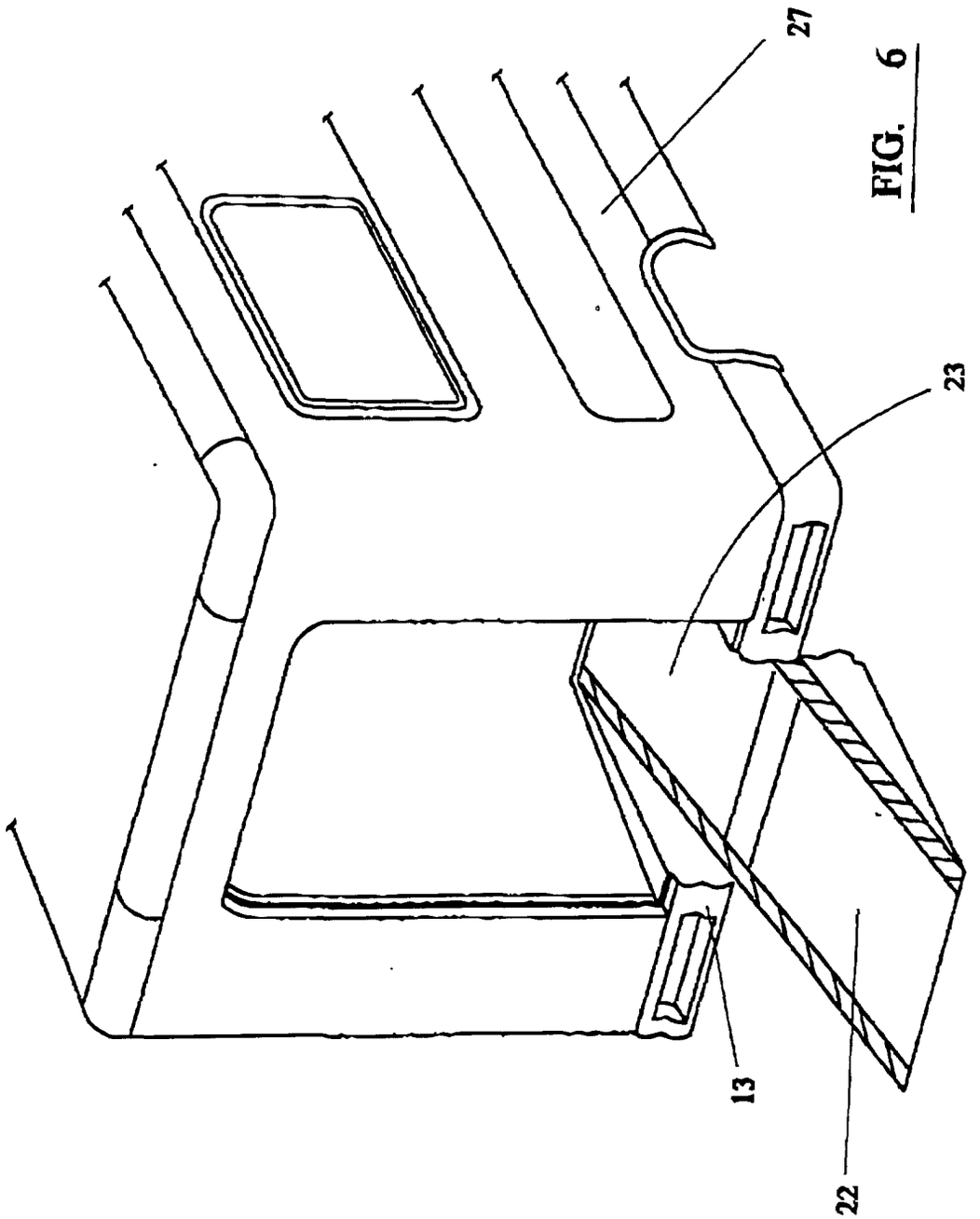


FIG. 6

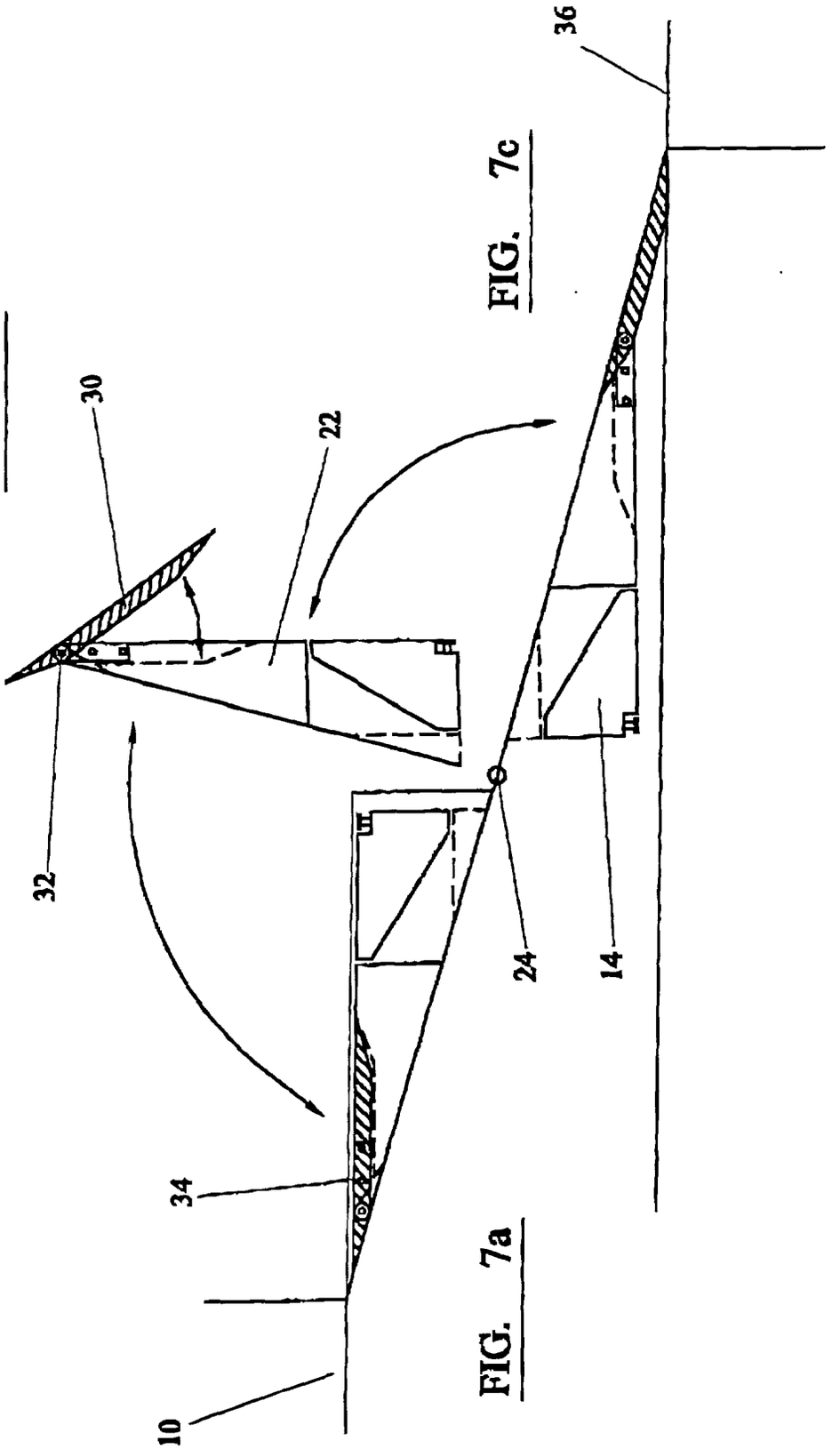


FIG. 7b

FIG. 7c

FIG. 7a