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(71) Applicant:
UVG (Ambulances) Limited
Brighous, West Yorkshire HD6 1QF (GB)

(72) Inventors:
- **Kitchen, Maurice**
  Cleckheaton, West Yorkshire BD19 5JA (GB)
- **Hugill, Mark**
  Mirfield, West Yorkshire WF14 0LD (GB)
- **Heaton, Nigel**
  Liversedge, West Yorkshire WF15 6AD (GB)

(74) Representative:
Neill, Alastair William et al
Appleyard
Lees & Co.
15 Clare Road
Halifax West Yorkshire HX1 2HY (GB)

(54) Ramp step assembly

(57) The invention relates to access apparatus which facilitates movement either by foot or by wheeled transport in and out of ambulances. The apparatus may also be used in hospitals, nursing homes or other permanent structures which are commonly used by able-bodied and wheel-chair users. The access apparatus comprises a combined step and ramp assembly moveable between a first, closed configuration, a second, access configuration in which the step (14) is accessible to persons on foot, and a third, access configuration in which the ramp (22) is accessible to receive wheeled transport.

EP 0 976 376 A2

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] The invention provides 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.

[0003] 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.

[0004] The step may be made accessible by pivoting the step from a closed position to an access position.

[0005] 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.

[0006] The ramp may be made accessible by pivoting the ramp from a closed position to an access position.

[0007] 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.

[0008] 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.

[0009] The ramp extension means may pivot out of a ramp extension means stowage space.

[0010] The step and ramp may pivot about different pivot points.

[0011] The step may be housed within the ramp such that when the ramp is in its closed position, the step may be pivoted out of the ramp to the step access position.

[0012] The movements of the step and ramp may be power operated, for example by means of a motor.

[0013] The motor may be electrically controlled.

[0014] The invention includes an access structure fitted with access apparatus according to the invention.

[0015] The access structure may comprise a vehicle.

[0016] The vehicle may comprise an ambulance.

[0017] 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.

[0018] Figure 1 shows the rear floor area 10 of an ambulance.

[0019] 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.

[0020] 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.

[0021] To facilitate this, the access apparatus incorporates a step 14 (see Figure 2).

[0022] In the lower configuration, the step comprises a vertical section 15 and a horizontal section 16, suitably connected together by brackets 17.

[0023] 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.

[0024] In different circumstances, the ambulance per-

sonnel may wish to unload or load a patient trolley and the access apparatus of this embodiment is able to cope with this situation also.

[0025] 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 part of the ramp structure.

[0026] 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.

[0027] The access apparatus described above can readily be incorporated into new ambulances during manufacture or alternatively it can be fitted subsequently to existing ambulances.

[0028] 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.

[0029] When the step 14 is not in use, it is locked in position by a manually operable catch 26.

[0030] 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.

[0031] 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.

[0032] 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).

[0033] 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.

[0034] 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.

[0035] 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.

[0036] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0037] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0038] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0039] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. An access apparatus comprising an assembly, characterised in that the assembly is 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.

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

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

4. An access apparatus as claimed in Claim 1, wherein the ramp comprises a ramp extension means.

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

6. An access apparatus as claimed in Claim 1, wherein the step and ramp pivot about different pivot points.

7. An access apparatus as claimed in Claim 1, wherein the step is housed within the ramp such that when the ramp is in its closed position, the step may be pivoted out of the ramp to the step access position.

8. An access apparatus as claimed in Claim 1, wherein the movements of the step and ramp are power operated.

9. An access structure characterised in that the access structure is fitted with access apparatus according to any preceding claim.

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

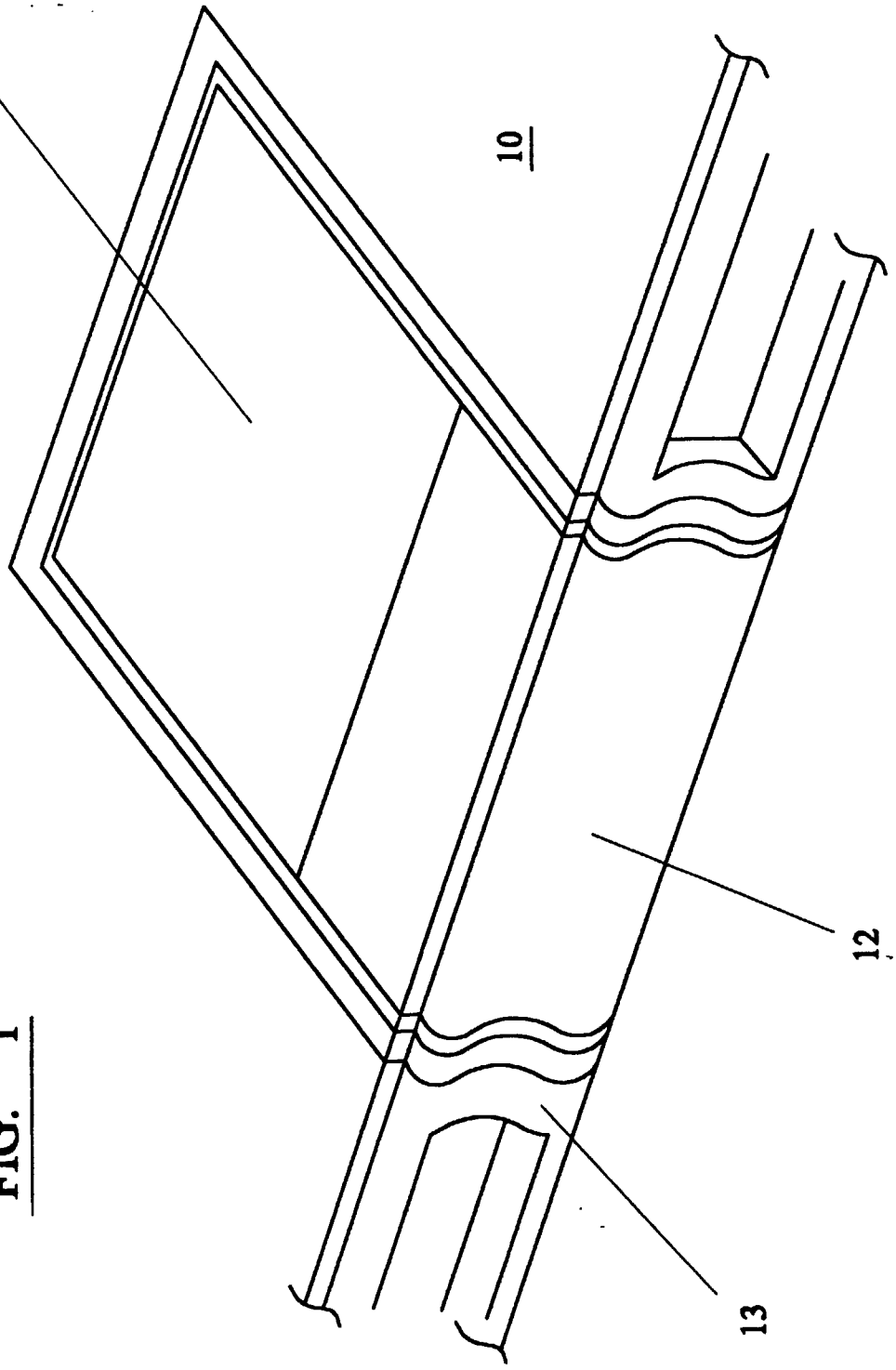


FIG. 1

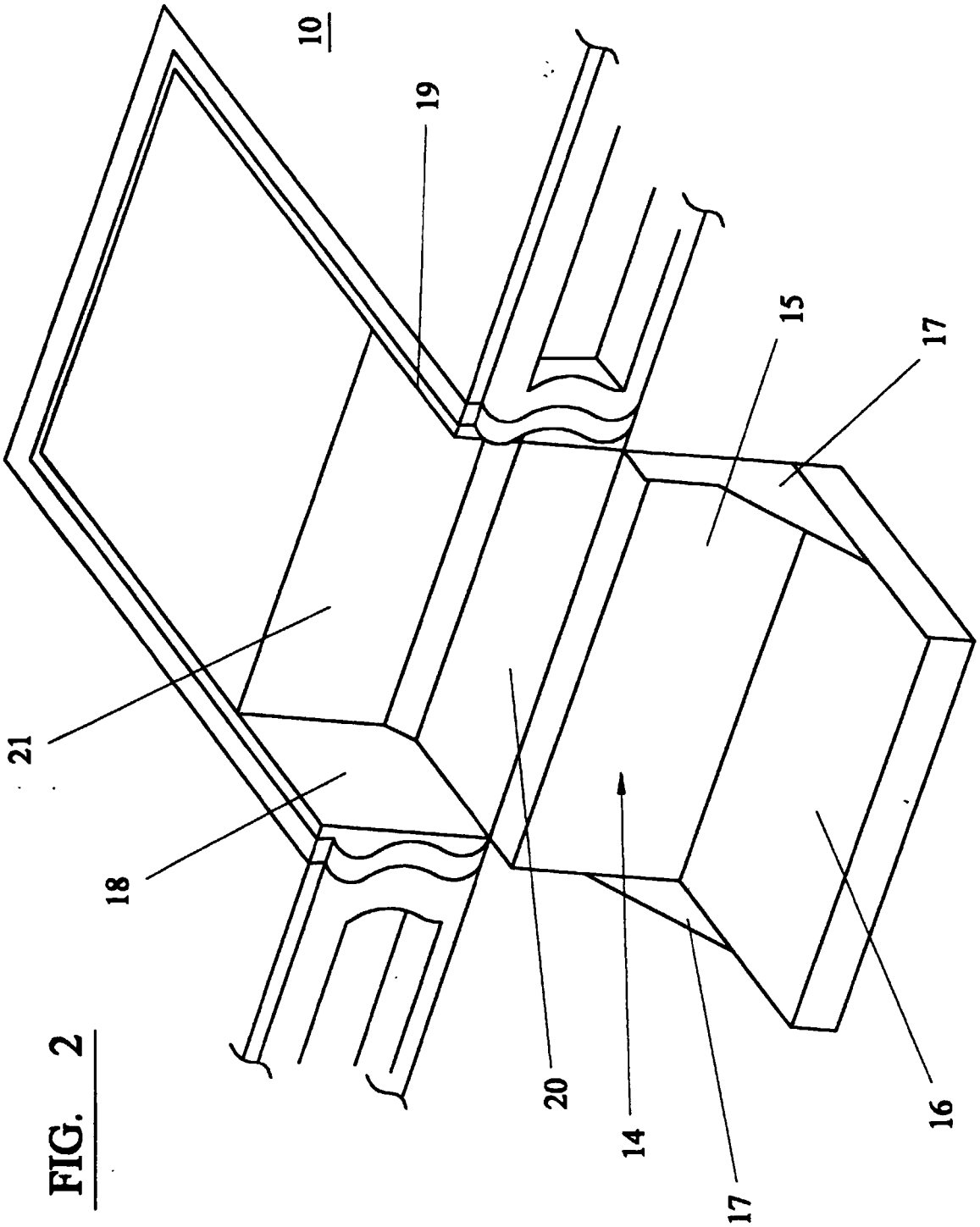


FIG. 2

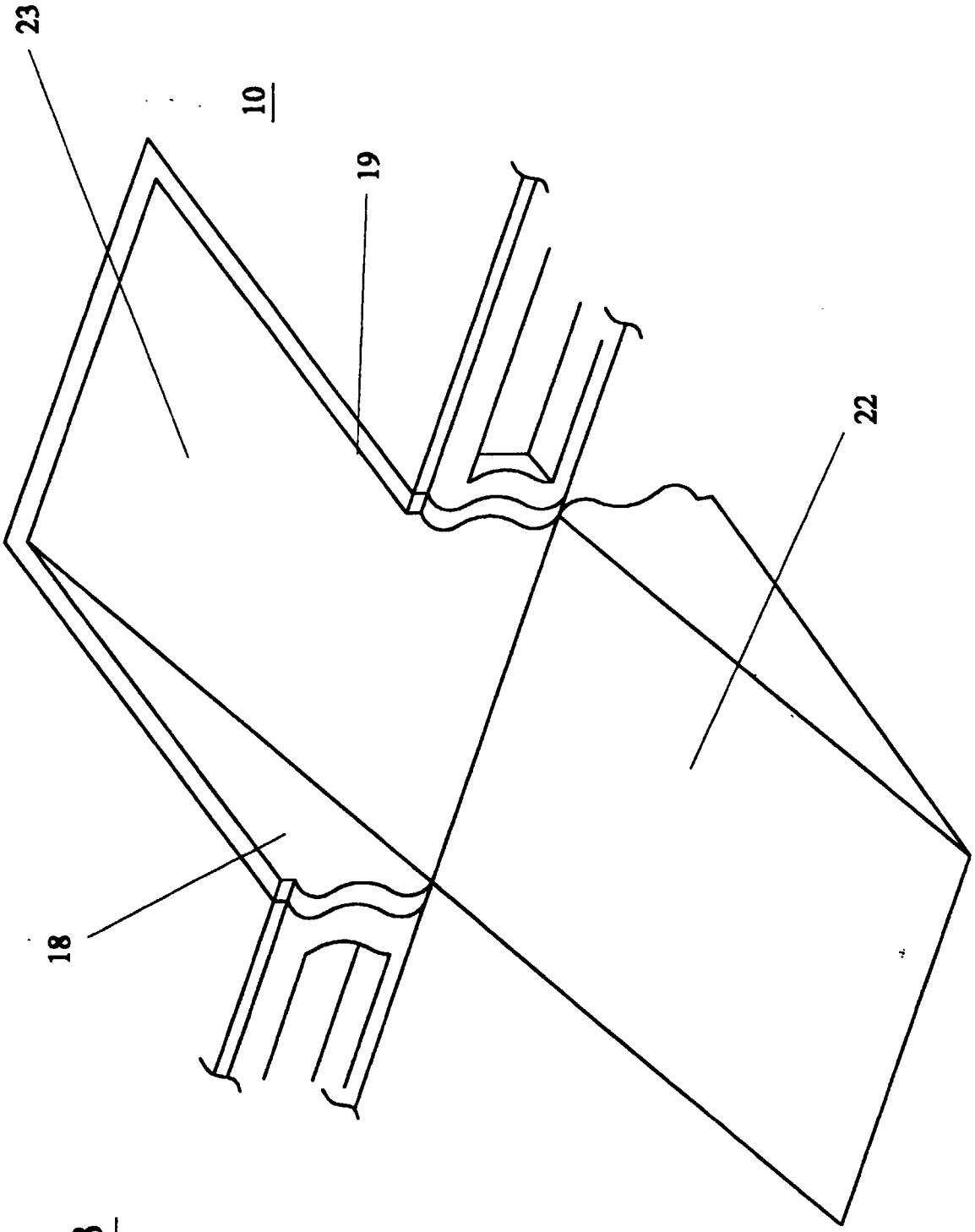
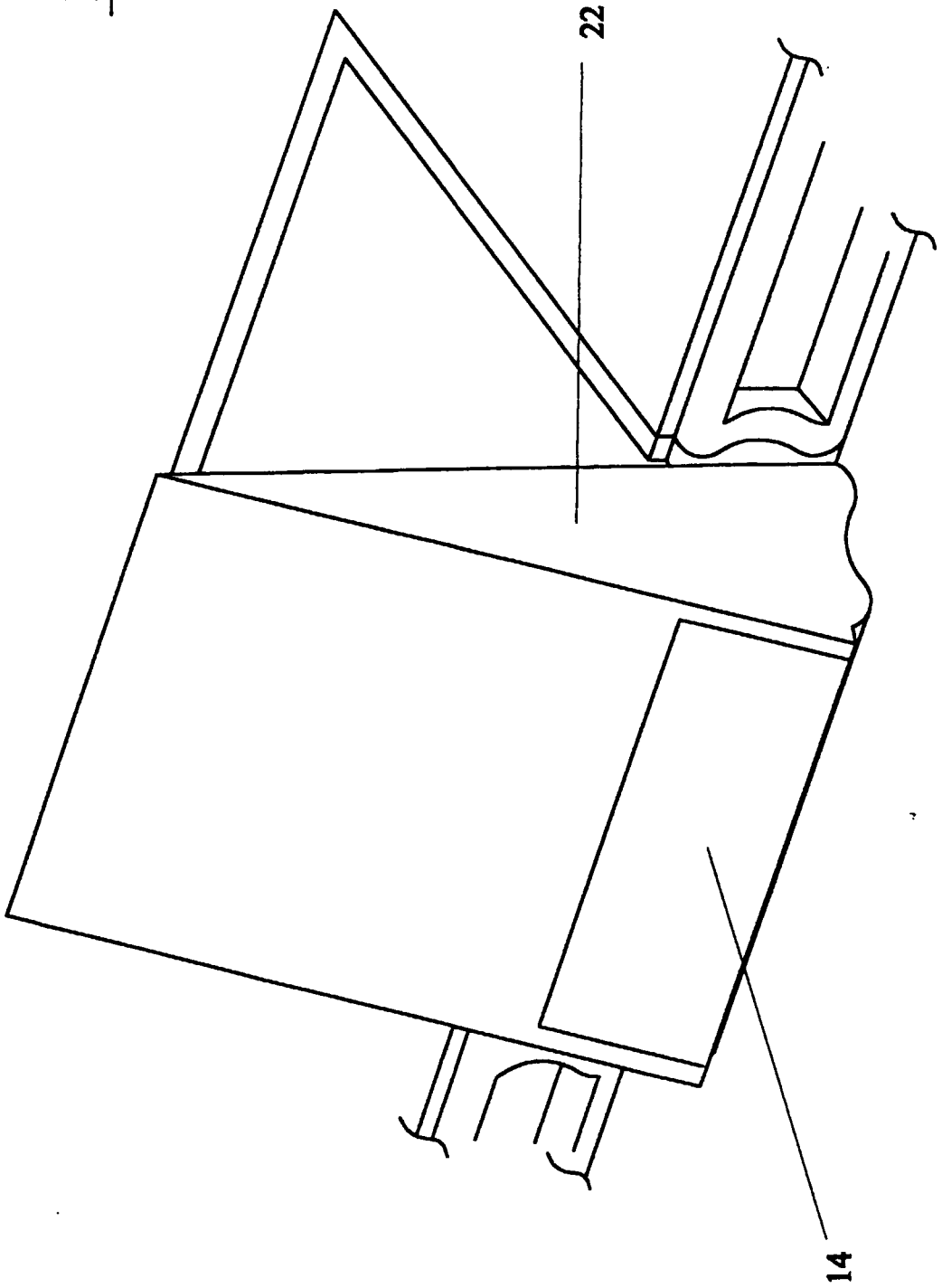


FIG. 3

FIG. 4



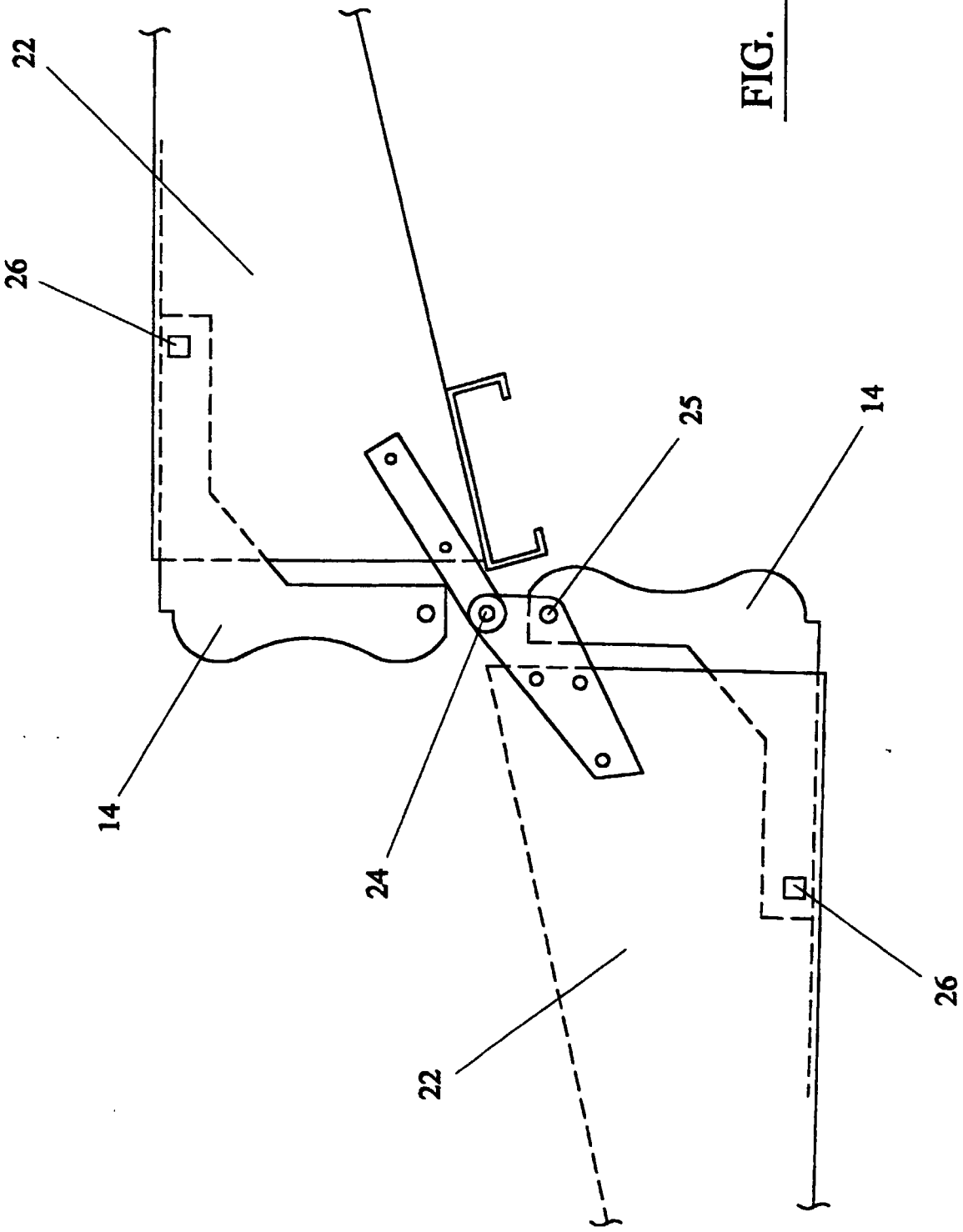


FIG. 5

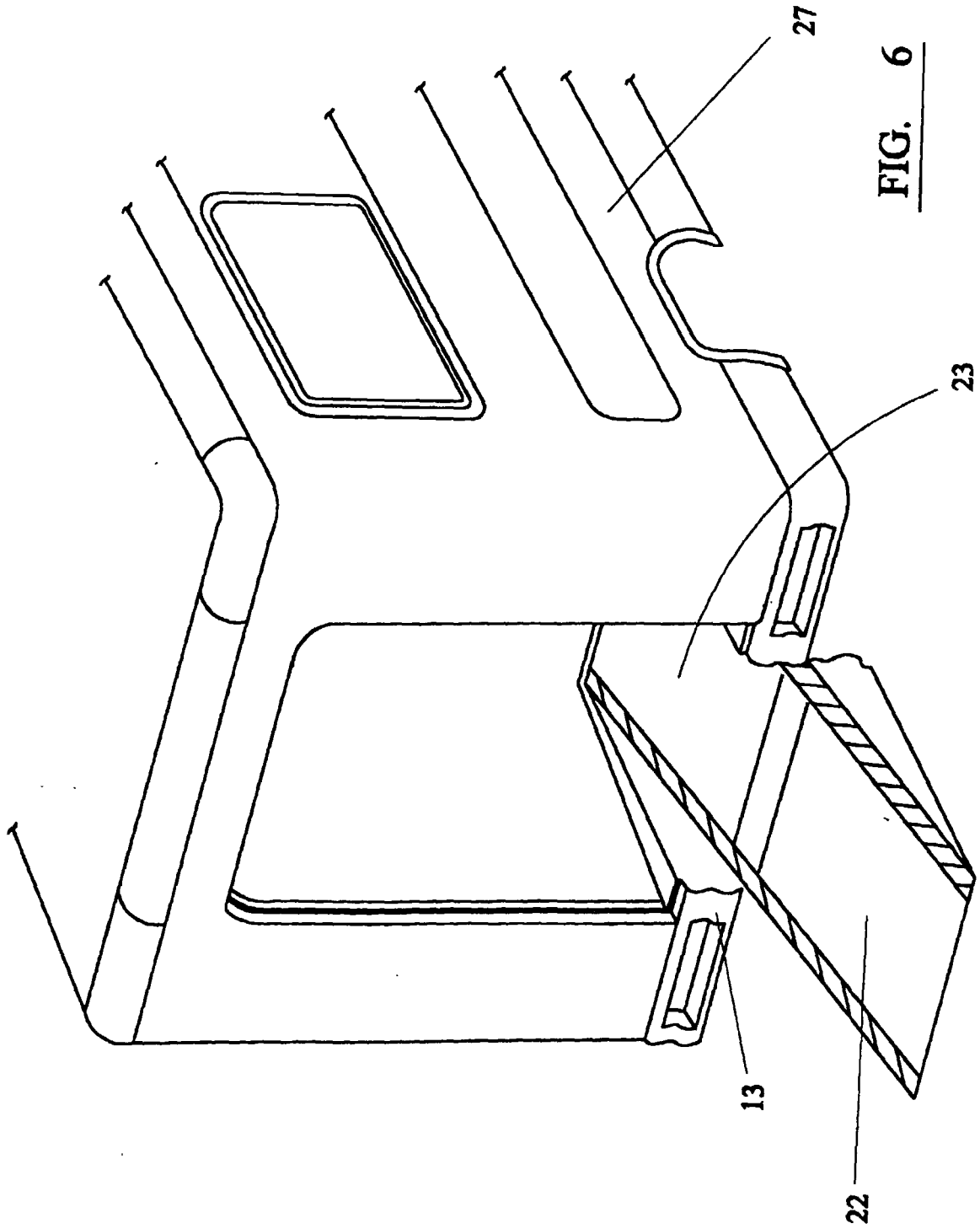


FIG. 6

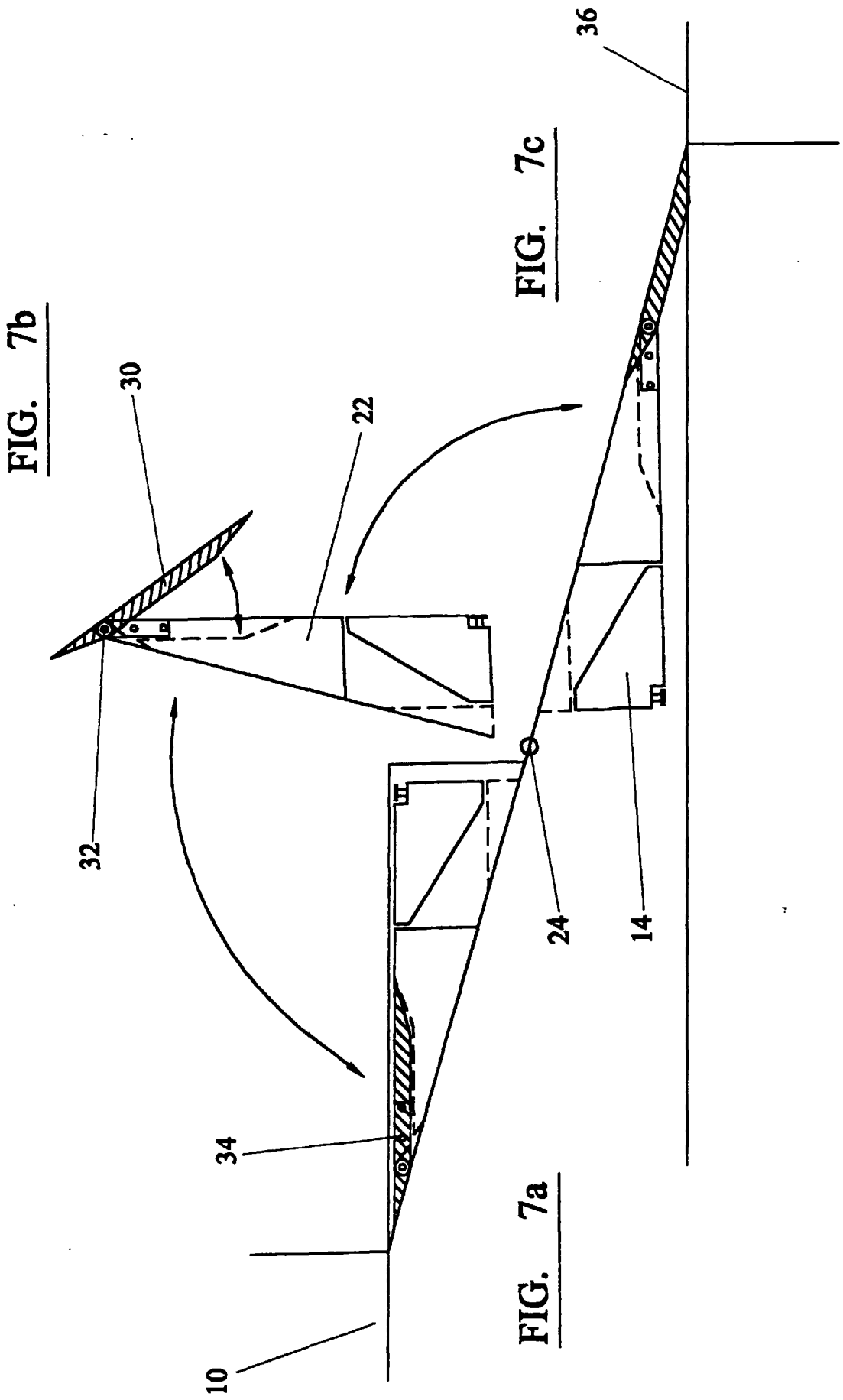


FIG. 7b

FIG. 7c

FIG. 7a