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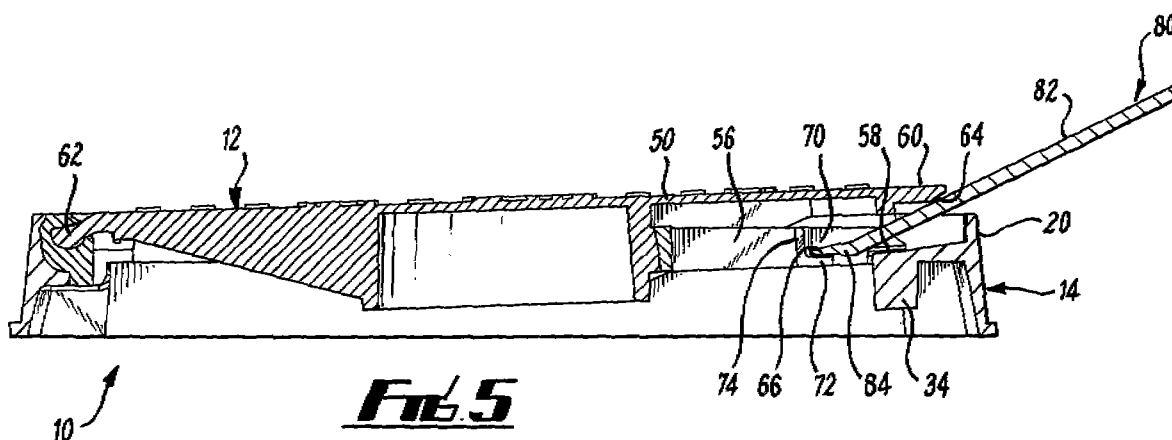
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(54) **Ground surface access covers**

(57) A ground surface access cover 12 is disclosed, for mounting to a frame 14 of a ground surface access assembly 10. The cover 12 defines a prising recess 70 for receiving in use a prising tool 80, the prising recess

70 being located on an underside in use of the cover 12, so that, in use, the prising recess 70 is not accessible to the tool 80 when the cover 12 is in a closed condition on the frame 14.



Description

[0001] The present invention relates to a ground surface access cover, particularly but not exclusively a ground surface access cover for mounting to a frame.

[0002] Ground surface access covers are commonly mounted to frames to form ground surface access assemblies and utilised at the ground surface to provide access to underground services. Conventionally such covers define key holes, and to gain access to the underground services a key is inserted into the key hole and the cover lifted out of the frame. Health and safety legislation has prompted a move towards the use of covers which are hingedly mounted to frames so that an operator does not have to lift the full weight of the cover. Typically a tip of a prising bar is inserted between the cover and the frame and the cover prised upwardly out of the frame, rotating about a hinge mounting. In the initial stages of the opening operation, the prising bar can lever off the frame, but as the cover moves away from the frame the cover must either be supported by the operator or another leverage point found.

[0003] In one known arrangement, a recess is provided in the upper surface in use of the cover into which a prising tool can be inserted. However in use the recess can quickly become clogged with debris, in which situation an operator is likely to revert for the sake of speed and convenience to the traditional method of prising and pulling, with the consequent increased risk of injury.

[0004] According to the present invention, there is provided a ground surface access cover for mounting to a frame of a ground surface access assembly, the cover defining a prising recess for receiving in use a prising tool, the prising recess being located on an underside in use of the cover, so that in use the prising recess is not accessible to the tool when the cover is in a closed condition on the frame.

[0005] Preferably, the cover is hingedly mounted in use to the frame, and preferably is movable between the closed condition and an open condition.

[0006] Preferably, the cover includes a hinge mounting part for mounting the cover to the frame.

[0007] Preferably, the cover includes a plurality of engagement surfaces, which in use are engaged by the tool to rotate the cover about the hinge mounting part.

[0008] Preferably, one of the engagement surfaces faces in a substantially downward direction in use. Preferably, another of the engagement surfaces faces in a substantially upward direction in use.

[0009] Preferably, the first prising surface is located at or towards the rim of the cover, substantially opposite the hinge mounting part.

[0010] Preferably, the cover includes a stop end wall, which limits the longitudinal movement of the tool in use into the recess.

[0011] Preferably, the cover includes a pair of recess side walls, which limit the lateral movement of the tool in use in the recess.

[0012] Preferably, the cover includes a recess base wall which may be formed by a pair of projections, one projection projecting inwardly from each of the recess side walls. Preferably the in use upper surfaces of the base wall projections form upwardly facing engagement surfaces.

[0013] Preferably, the stop end wall, the side walls and the base wall together define the recess.

[0014] Preferably, a pair of inwardly directed retaining projections project from the recess side walls, one retaining projection projecting from each side wall. Preferably in use in a closed condition in the frame, the retaining projections engage a locking projection projecting from the frame to lock the cover in the closed condition on the frame. Preferably the recess side walls are resiliently deformable, and to move the cover from the closed condition to the open condition, the side walls must deform to allow the retaining projections to disengage from the locking projection.

[0015] Further according to the present invention, there is provided a ground surface access assembly, the ground surface access assembly including a ground surface access cover as described above in the preceding paragraphs, the ground surface access cover mounted to a frame.

[0016] Still further according to the present invention, there is provided a prising tool for lifting in use a cover as described above in the preceding paragraphs.

[0017] Yet still further according to the present invention, there is provided a method of lifting a ground surface access cover, the cover being mounted on a frame, the method including a first step of prising the cover upwardly to allow the insertion of a prising tool between the cover and the frame, and a second step of inserting the prising tool into a prising recess defined by the cover, the prising recess being located on an underside in use of the cover.

[0018] Preferably, the cover is as described above in the preceding paragraphs.

[0019] An embodiment of the present invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of a ground surface access assembly;

Fig. 2 is a perspective view of part of a frame of the ground surface access assembly;

Fig. 3 is a perspective view of the underside in use of a ground surface access cover;

Fig. 4 is a cross sectional view from one side of the ground surface access assembly, with a prising tool;

Fig. 5 is another cross sectional view from the side of the ground surface access assembly with the prising tool; and

Fig. 6 is a side view of the ground surface access assembly in an open condition.

[0020] Fig. 1 shows a ground surface access assembly 10 including a ground surface access cover 12 arranged in a closed condition in a frame 14.

[0021] Fig. 2 shows the frame 14 in more detail, the frame defining an opening 24 and including a side wall part 20 upstanding from a flange part 22. The side wall part 20 extends outwardly away from the opening 24 to define a prising tab receiving compartment 26 and, diametrically opposite to the prising tab receiving compartment 26, a hinge compartment 28.

[0022] The frame 14 includes a prising tab receiving compartment base wall 30 which extends between the side wall parts 20 defining the prising tab receiving compartment 26. A locking projection support wall 32 extends downwardly from the prising tab receiving compartment base wall 30. A locking projection 34 extends inwardly from the locking projection support wall 32. The locking projection 34 is of a constant cross sectional shape, and includes an upper convex face 36 which extends downwardly to two lower side faces 38 which are mutually downwardly convergent. A widest part 37 is thus defined between the upper convex face 36 and the two lower side faces 38.

[0023] A cover support part 42 extends inwardly from the side wall part 20 around the opening 24, with a break in the region of the prising tab receiving compartment 26. Gaps 40 are defined between the locking projection 34 and the ends of the cover support part 42.

[0024] Fig. 3 shows the cover 12 which includes a substantially planar part 50. A rim part 52 extends downwardly around the periphery of the planar part 50. A reinforcement hub part 54 extends downwardly from a central region of the underside of the planar part 50. A prising tab 60 extends outwardly from the rim part 52 and a hinge part 62 extends outwardly from the rim part 52 diametrically opposite to the prising tab 60.

[0025] A pair of spaced locking fingers 56 extend outwardly from the reinforcement hub part 54, the locking fingers 56 being spaced downwardly from the underside of the planar part 50. The locking fingers 56 are formed of a resiliently deformable material, such as ductile iron. The locking fingers 56 could be formed by casting integrally with the cover 12.

[0026] Retaining projections 58 extend inwardly towards each other from an end region at the free end of each of the locking fingers 56.

[0027] A recess base wall projection 72 extends inwardly from each of the locking fingers 56, spaced inwardly from the retaining projections 58. Each of the recess base wall projections 72 extends upwardly to form recess end wall projections 74. The locking fingers 56, the recess base wall projections 72 and the recess end wall projections 74 together define a prising recess 70, the locking fingers 56 forming recess side walls.

[0028] Gaps are defined between each of the recess

base wall projections 72 and between each of the recess end wall projections 74 to permit the locking fingers 56 to move independently.

[0029] To assemble the cover 12 to the frame 14, the hinge part 62 of the cover 12 is located in the hinge compartment 28 of the frame 14, and the cover 12 rotated about the hinge part 62 into the opening 24. As the cover 12 moves into the opening 24, the retaining projections 58 locate against the rounded upper convex face 36 of the locking projection 34. A force is then applied to the upper surface of the planar part 50 of the cover 12 to deform the locking fingers 56 away from each other, so that the retaining projections 58 move downwardly along the upper convex face 36 of the locking projection 34, over the widest part 37 and onto the converging lower side faces 38.

[0030] With the retaining projections 58 located against the converging lower side faces 38, the rim part 52 of the cover 12 is seated on the cover support part 42 of the frame 14 in the closed condition as shown in fig. 1.

[0031] In this condition, the prising tab 60 is received within the prising tab receiving compartment 26. The resilient property of the locking fingers 56 holds the retaining projections 58 against the converging lower side faces 38, securing the cover 12 in the closed condition in the frame 14. The force required to deform the locking fingers 56 is determined by the size and material of the locking fingers 56 and the sizes and shapes of the retaining projections 58 and the locking projection 34. In one example, the cover 12 could be located in the frame 14 in the closed condition by a force applied by a weight of approximately 70kg, for example, by a man standing or jumping on the upper surface of the planar part 50. Thus the cover 12 can be relatively easily secured in position in the frame 14.

[0032] A similar and opposite force must be applied to move the cover 12 from the closed condition to an open condition, in which access is permitted through the opening 24. In this respect, it is important to note that the cover 12 does not define any apertures or passages such as keyways. Such apertures or passages quickly become blocked in use, and can take considerable time on site to unblock and bring into a useable condition. The use of keys within key ways is increasingly seen as a hazard in health and safety terms, since such implements generally require a user to lift a heavy object in an awkward bending position, with a high risk of injury.

[0033] The cover 12 of the ground surface access assembly 10 according to the invention is moved from the closed condition to the open condition in the frame 14 as follows. Referring to Fig. 1, a gap 88 is defined between the prising tab 60 and the side wall part 20 of the frame 14. Referring to Fig. 4, a prising tool 80 includes a handle 82, a head 84 extending from the handle 82 at an oblique angle to the handle 82, the head 84 tapering to a tip 86. The tip 86 is inserted into the prising gap 88 and the prising tool 80 pivoted on the frame side wall part 20, the head 84 engaging the underside of the prising tab 60,

levering the cover 12 upwards so that it rotates around the hinge part 62.

[0034] As a user applies force to the handle 82 of the prising tool 80, the retaining projections 58 of the locking fingers 56 are forced apart over the widest part 37 of the locking projection 34, allowing upward movement of the cover 12. As the retaining projections 58 pass over the widest part 37 of the locking projection 34, the user applying the force will feel a change in resistance to the application of the force. At this stage the user can cease to apply the force and the cover 12 will rest in a partially open condition as shown in Figs. 4 and 5 in which the retaining projections 58 rest on the upper convex face 36 of the locking projection 34.

[0035] The user then inserts the prising tool 80 further into the gap between the cover 12 and the frame 14 so that the head 84 of the prising tool 80 locates in the prising recess 70 as shown in fig. 5. The head 84 of the prising tool 80 locates against the recess base wall projections 72 and the tip 86 of the prising tool 80 locates against the recess end wall projections 74, which act as a stop, limiting the longitudinal movement of the prising tool 80 into the prising recess 70. The locking fingers 56 forming the recess side walls limit the lateral movement of the prising tool 80 in the prising recess 70. The recess base wall projections 72, the recess end wall projections 74 and the recess side walls formed by the locking fingers 56 thus give the user confidence that the prising tool 80 is located correctly and securely before applying further force to lift the cover 12.

[0036] The user then lifts the handle 82 of the prising tool 80 so that the handle 82 of the prising tool contacts an underside engagement surface 64 of the prising tab 60, while the head 84 is also in contact with upper engagement surfaces 66 of the base wall projections 72. As an upward force is applied to the handle 82, the engagement surfaces 64, 66, lock the prising tool 80 in position relative to the cover 12 so that as the upward force is applied the cover 12 rotates about the hinge part 62 to a fully open condition as shown in Fig. 6 allowing access to the opening 24.

[0037] The opening of the cover 12 in the frame 14 is thus accomplished in two steps: firstly the insertion of the tip 86 of the prising tool 80 between the cover 12 and the frame 14 to lever the retaining projections 58 of the locking fingers 56 past the widest part 37 of the locking projection 34 and lift the cover 12 to the partially open condition; and secondly the insertion of the prising tool head 84 into the prising recess 70 to secure the prising tool 80 in position relative to the cover 12 and allow further lifting of the cover 12 to the fully open condition.

[0038] The positioning of the prising tab 60 and prising recess 70 diametrically opposite the hinge part 62 permits the greatest mechanical advantage to be obtained for the lifting operation.

[0039] Various other modifications may be made without departing from the scope of the invention. The prising tool could be of any suitable design. A prising tool having

a longer handle provides a relatively greater mechanical advantage in both the first step of prising the cover from the closed condition to the partially open condition and also in the second step of moving the cover from the partially open condition to the fully open condition.

[0040] The locking means by which the cover is secured to the frame, in this example comprising the locking fingers 56, the retaining projections 58 and the locking projection 34, could be of any suitable design in which a force is applied against the bias of a resilient member. The prising recess could be defined by any suitable arrangement on the underside of the cover 12. For example, a prising recess defined by side walls, an end wall and a base wall could be provided separate to the locking fingers or locking means.

[0041] The cover could include a plurality of prising tabs and prising recesses, and the frame could include a plurality of prising tab receiving compartments.

[0042] The cover and frame could be of any suitable size and shape.

[0043] There is thus provided a ground surface access cover which can be lifted easily from a closed condition to an open condition with the aid of a suitable tool. The invention provides a recess for receiving the tool to hold the tool secure during the lifting operation, giving the user confidence. The recess will not become blocked when the cover is in the closed condition. The hidden recess also aids security as it is not obvious in the closed condition as to how the cover should be opened and lifted.

[0044] Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims

1. A ground surface access cover (12) for mounting to a frame (14) of a ground surface access assembly (10), **characterised in that** the cover (12) defines a prising recess (70) for receiving in use a prising tool (80), the prising recess being located on an underside in use of the cover, so that in use the prising recess is not accessible to the tool when the cover is in a closed condition on the frame.
2. A cover according to claim 1, in which the cover is movable between the closed condition and an open condition.
3. A cover according to claims 1 or 2, in which the cover is hinged mounted in use to the frame.
4. A cover according to claim 3, in which the cover includes a hinge mounting part (62) for mounting the

- cover to the frame.
5. A cover according to any of the preceding claims, in which the cover includes a plurality of engagement surfaces (64, 66). 5
 6. A cover according to claim 5 when dependent on claim 4, in which the engagement surfaces in use are engaged by the tool to rotate the cover about the hinge mounting part. 10
 7. A cover according to claims 5 or 6, in which one of the engagement surfaces (64) faces in a substantially downward direction in use. 15
 8. A cover according to claim 7 when dependent on claim 4 or any claim dependent thereon, in which the downwardly directed engagement surface (64) is located at or towards the rim of the cover, substantially opposite the hinge mounting part. 20
 9. A cover according to any of claims 5 to 8, in which another of the engagement surfaces (66) faces in a substantially upward direction in use. 25
 10. A cover according to any of the preceding claims, in which the cover includes a stop end wall (74), which limits the longitudinal movement of the tool in use into the recess. 30
 11. A cover according to any of the preceding claims, in which the cover includes a pair of recess side walls (56), which limit the lateral movement of the tool in use in the recess. 35
 12. A cover according to any of the preceding claims, in which the cover includes a recess base wall (72). 40
 13. A cover according to claim 12 when dependent on claim 11, in which the recess base wall is formed by a pair of projections (72), one projection projecting inwardly from each of the recess side walls. 45
 14. A cover according to claim 13 when dependent on claim 9 or any claim dependent thereon, in which the in use upper surfaces of the base wall projections form the upwardly facing engagement surfaces. 50
 15. A cover according to any of claims 12 to 14 when dependent on claims 10 and 11, in which the stop end wall, the side walls and the base wall together define the recess. 55
 16. A cover according to claim 11 or any claim dependent thereon, in which a pair of inwardly directed retaining projections (58) project from the recess side walls, one retaining projection projecting from each side wall.
 17. A cover according to claim 16, in which in use in a closed condition in the frame, the retaining projections engage a locking projection (34) projecting from the frame to lock the cover in the closed condition on the frame.
 18. A cover according to claim 17, in which the recess side walls are resiliently deformable, and to move the cover from the closed condition to the open condition, the side walls must deform to allow the retaining projections to disengage from the locking projection.
 19. A ground surface access assembly (10), **characterised in that** the ground surface access assembly includes a ground surface access cover (12) according to any of the preceding claims, and a frame (14), the cover being mountable to the frame.
 20. A prising tool (80) for lifting in use a cover according to any of the claims 1 to 18.
 21. A method of lifting a ground surface access cover (10), the cover (10) being mounted on a frame (14), **characterised in that** the method includes a first step of prising the cover upwardly to allow the insertion of a prising tool (80) between the cover and the frame, and a second step of inserting the prising tool into a prising recess (70) defined by the cover, the prising recess being located on an underside in use of the cover.
 22. A method according to claim 21, in which the cover is according to any of claims 1 to 18.

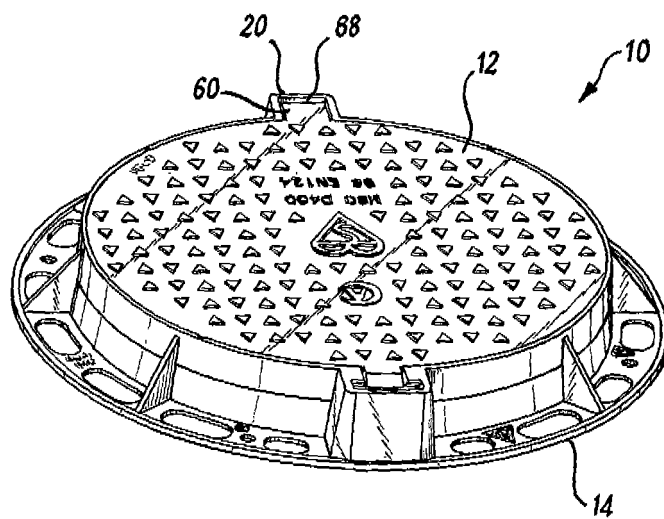


Fig. 1

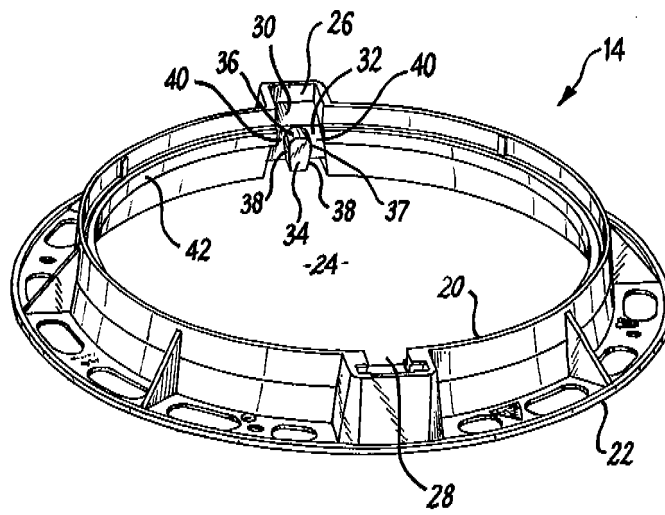


Fig. 2

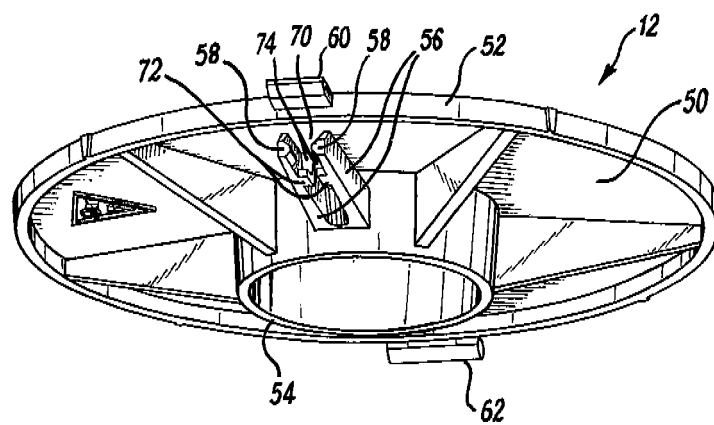
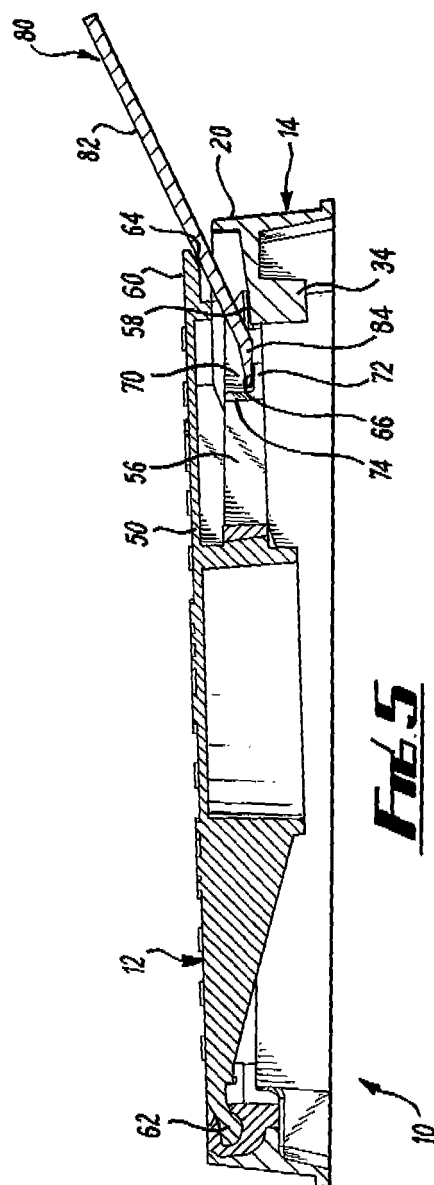
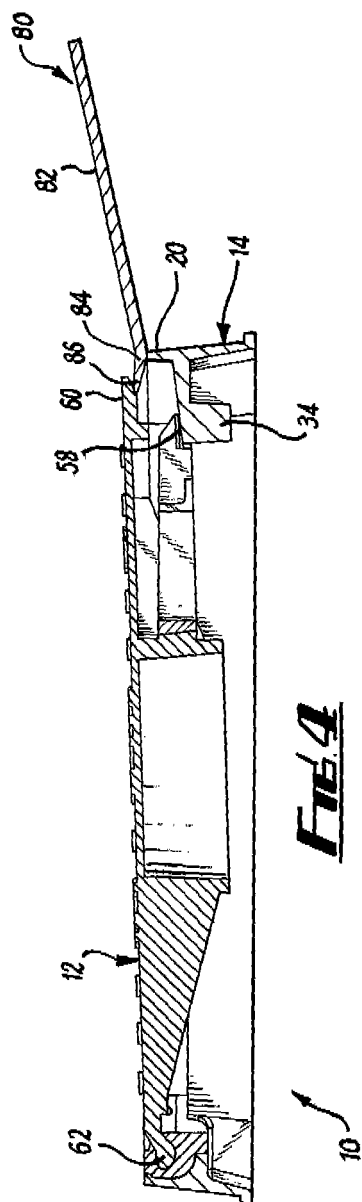


FIG. 3



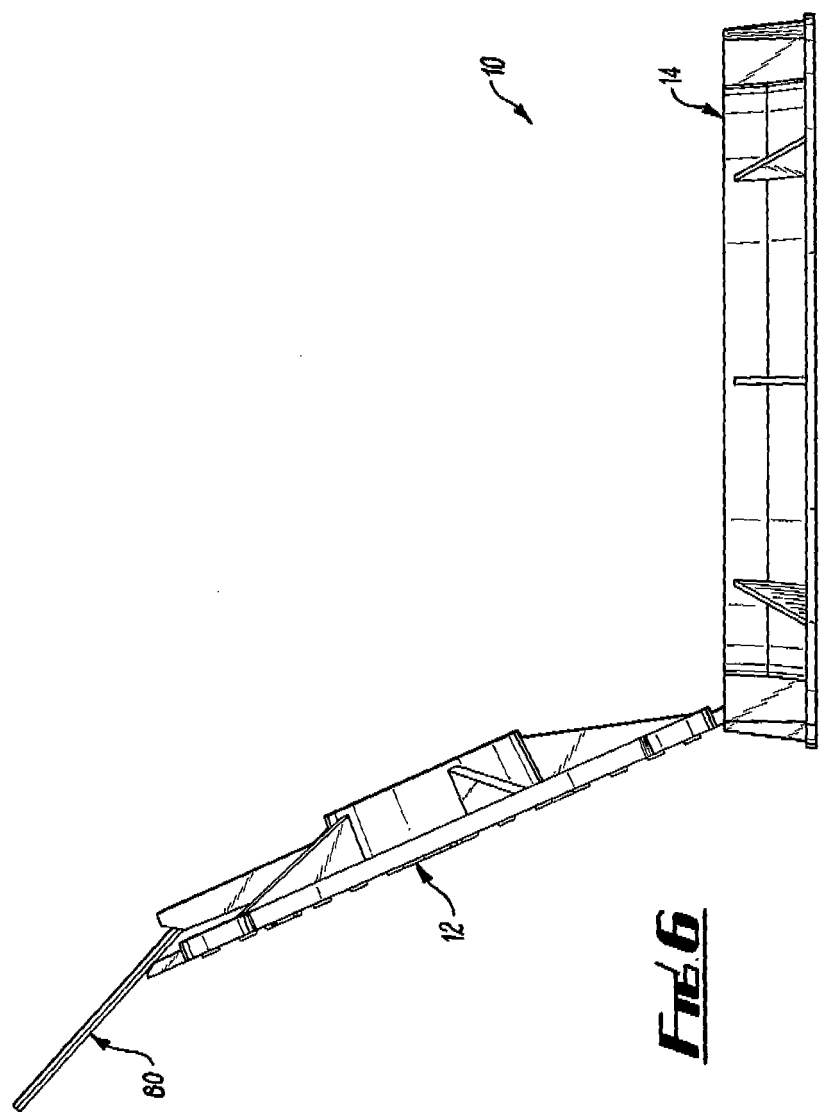


Fig. 6