

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 82303000.2

(51) Int. Cl.³: **B 66 F 11/04**
B 66 C 13/02, B 63 B 27/16

(22) Date of filing: 10.06.82

(30) Priority: 11.06.81 GB 8117902

(43) Date of publication of application:
22.12.82 Bulletin 82/51

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: **PRIESTMAN BROTHERS LIMITED**
Hedon Road
Hull, HU9 5PA(GB)

(72) Inventor: **Brocklebank, Norman**
St. Mary's Lodge New Walk
Beverley North Humberside(GB)

(72) Inventor: **Deighton, Kenneth**
1, Priory Crecent
Cottingham North Humberside(GB)

(74) Representative: **Brunner, Michael John et al,**
Gill Jennings & Every 53/64 Chancery Lane
London WC2A 1HN(GB)

(54) Access device.

(57) The invention relates to a device for enabling access to a relatively moving structure such as a ship. The device has a base (1), a linkage (5, 8, 9) supported on the base and a work station (10) supported by the linkage. The linkage is adjustable controllably to vary the position of the work station (10) relative to the base (1) and means (2) are provided for attaching the work station (10) to the ship. The linkage (5, 8, 9) is automatically freed from control when the work station (1) is in position on the ship.

- 1 -

PRIESTMAN BROTHERS LIMITED

GJE 5182/023

ACCESS DEVICE

The present invention relates to devices for enabling access to be gained, for work or other purposes, to a relatively moving structure.

It has previously been proposed (see GB-A-1136971)

5. to mount a walkway, which is telescopically extendable, pivotably on a tower structure so that, for example, one end of the walkway can be fixed to an entry port to a ship, the pivotal mounting and telescopic extendability of the walkway allowing movement of the
10. ship to be accommodated without manual adjustment of the walkway. The device may be powered so that it can be accurately positioned until locked onto the ship and the controls then freed to enable the device to accommodate movement of the ship. Such a device has
15. only limited applications, generally being capable of use only where the walkway can be positioned approximately horizontally to enable personnel to walk along it. There is a need therefore for a device having greater utility.
20. Inspection platforms mounted by means of an articulated or telescopic arm on a vehicle, are well known for enabling work to be carried out on overhead lighting, external walls of buildings etc. However, there is also a requirement for similar devices in
25. conjunction with ships and other sea-going vessels.

- 2 -

- For example, in certain circumstances such a device may be required in order to unload cargo or personnel from a ship onto a wharf or external repair work may be required to be carried out on a ship or oil rig
5. from an adjacent wharf or ship respectively. An obvious difficulty lies in maintaining the platform or work station in a fixed position relative to the vessel, particularly where this position has to be maintained for anything other than a very short
10. period of time. Whilst a device which includes systems to monitor relative motion between, for example a wharf and a ship, and selectively adjust the position of the platform or work station accordingly, can be envisaged, high technology electro- or hydro-mechanical
15. systems are required thus making a device of this type extremely complicated, expensive and also possibly not very safe.

- In order to overcome this problem and in accordance with the present invention a device for
20. enabling access to a relatively moving structure comprising a base; a work platform or station; a linkage supporting the work platform or station from the base, the linkage being adjustable controllably to vary the position of the work platform or station
25. relative to the base; means for attaching the work platform or station to the structure; and means for automatically freeing the linkage when the work platform or station is attached in position on the structure.

30. The base of the device may comprise a mobile chassis or can be mounted in fixed position depending upon the application and the linkage may comprise a conventional hydraulically powered articulated and/or telescopic boom which is rotatable on the base and
35. to which the work platform or station may also be pivotally mounted.

- 3 -

- Preferably, the means for locking the work platform or station in a fixed position relative to the structure comprises a suction pad through which air is withdrawn by a vacuum pump located on the work platform. Alternatively, one or more electro-magnets may be used or cooperating mechanical connector elements on the structure and work platform or station could be provided to positively locate the platform or station in position on the structure.
5. The particular means employed will vary depending upon the application, for example, although an electro-magnetic system may be usable when work on the side of ships hulls, particularly if the magnetic fields were damaging to, for example navigational equipment on board the ship, then a suction pad or "limpet" would be preferable.
10. 15.

- Preferably the means for freeing the linkage from control will comprise a probe, contact of which with the structure is arranged to disable the control of the linkage and also initiate attachment to the structure. The platform is thereafter free to follow the motion of the moving structure.
- 20.

- It will be appreciated that a device according to the present invention has application wherever there is relative motion between a first point and a second point so that, for example, whilst it has been mentioned above that a ship might be inspected from a jetty or wharf, a similar device could be used on board a ship to inspect or work on harbour walls, sea platforms or other ships etc.
25. 30.

One example of a device constructed in accordance with the present invention will now be described with reference to the accompanying diagrammatic drawing.

- The device has a base 1 which comprises a conventional cylindrical plinth 2 such as is to be found on a sea-going crane, the plinth 2 supporting
- 35.

- 4 -

- a slewing ring 3 and being secured to a wharf or jetty 4 in use. A support platform 5 is mounted on the slewing ring and carries a hydraulic pump and driving motor (not shown) in order to rotate the support
5. platform on the plinth and also to operate hydraulic rams 6 and 7 which control the motion of a pair of arms 8, 9. The arms 8 and 9 form parts of a pivotal linkage, the arm 8 being pivotally mounted at one end on the support platform 5 and the arm 9
10. being pivotally connected at one end to the other end of the arm 8.

- At the free end of the arm 9, again pivotally mounted, is a work platform 10. The work platform 10 has a frame structure to provide hand-rail type
15. support for personnel. The platform 10 is fully articulated relative to the arm 8, allowing for side-to-side and for-aft swing movement as well as rotation of the platform about its central axis 11. Rotation about the central axis will preferably be limited
20. to say plus or minus 55°. Preferably the work platform is also fully insulated from the arms 8 and 9 and thus from the base.

- At its lower end the platform 10 carries a suction pad or "limpet" 12 which is operable by a vacuum pump
25. (not shown) located on the platform 10. A probe 13 extends below the limpet 12 to disable the control of the arms 8, 9 and also to initiate suction of the limpet 12 for attachment purposes. The probe 13 is arranged so that on initial contact with the structure
30. to which the platform is to be attached hydraulic control of the arms 8 and 9 is gradually released through valves, allowing a gradual "float" down onto the deck of the structure. As the probe is depressed further a second operation is initiated to apply
35. vacuum to the limpet or suction pad causing the device to lock onto the underlying deck.

- 5 -

Suction is provided through a vacuum pump and an evacuated accumulator and in order to avoid problems with slight leakage through the lip of the limpet, adhesion can be maintained by intermittent

5. start up of the pump and accumulator system.

At all times whilst the limpet suction is operative the rams controlling the arms 8 and 9 and the motor controlling slewing of the support platform 5 are put into a "free fall/swing" condition thus

10. allowing the device to be controlled by motion of the structure to which it is attached. An override enables personnel on the work platform 10 to release the suction and reactivate the hydraulic control of the arms so as to withdraw from the structure. As is

15. conventional for a support platform in the event of complete hydraulic failure free motion can be arrested by lock valves on the rams.

Although the device has been described with a suction pad at the bottom of the work platform it will

20. be appreciated that for side-fitting purposes the position of the limpet could be changed and similarly for underside attachment.

- 6 -

CLAIMS

1. A device for enabling access to a relatively moving structure, the device comprising a base (1); a linkage (5, 8, 9) supported on the base; and a work station (10) supported by the linkage, the linkage
5. being adjustable controllably to vary the position of the work station relative to the base, characterized by means (12) for attaching the work station (10) to the relatively moving structure; and means (13) for automatically freeing the linkage (5, 8, 9) from control
10. when the work station (10) is in position on said structure.
2. A device according to claim 1, characterized in that the means (12) for attaching the work station (10) comprises a suction pad (12) and a vacuum pump
15. for drawing air through the suction pad.
3. A device according to claim 1, characterized in that the means (12), for attaching the work station to the structure comprises at least one electro-magnet.
4. A device according to any of claims 1 to 3,
20. characterized in that the means (13) for freeing the linkage (5, 8, 9) from control comprises a probe (13), contact of which probe with the structure being arranged to disable control of the linkage and actuate the means (12) for attaching the work station (10) to the
25. structure.

- 7 -

5. A device according to any of claims 1 to 4, characterized in that the linkage comprises a pair of arms (8, 9); the base (1) comprising a plinth (2), the plinth supporting a slewing ring (3) at its top end, the slewing ring (3) pivotally supporting a first end of a first (8) one of the arms, the other end of the first arm (8) pivotally supporting a first end of the second arm (9); and the other end of the second arm (9) pivotally supporting the work station (10).
- 10.

