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(12) # EUROPEAN PATENT SPECIFICATION

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Description

The present invention is directed to the problems associated with the cleaning of the cargo holds of ships and is a device for use in connection with that operation.

In cleaning cargo holds primarily intended for dry bulk cargoes, of after carrying such cargoes, e.g. coal or grain, it is normal to replace the manhole covers which normally cover the bilge wells with flat strainers, before washing out the hold. It is intended that the strainers will prevent some at least of any solid matter which remains in the hold from entering the bilges and giving rise to blockages therein. Unfortunately such strainers themselves readily become choked with solid matter and the washing operation is thereby slowed down or interrupted. The removal of a strainer for cleaning inevitably opens up the bilge to the solid matter which the strainer was intended to retain.

It will be seen, and is readily appreciated by those with experience of this problem, that there is a real need for an improvement to this hold cleaning operation, in order to reduce bilge blockage and minimise down time. The present invention is intended to provide such an improvement.

My invention is a device for cargo hold cleaning which comprises a spindle having a threaded portion adjacent to a first end (the "lower" end) thereof, a boss mounted upon said spindle so as to rotate freely thereon but secured against movement relative to the length of said spindle, at least two fixed arms, projecting generally radially from said boss, an internally threaded member engaging said threaded portion of the spindle, at least two retractable arms, pivotted at their radially inward ends to said threaded member and linked by struts to corresponding fixed arms so that said retractable arms may, by movement of said threaded member along the spindle, be movable between a retracted position of lesser radial extent and an extended position in which they are disposed essentially radially relative to said spindle and in which they are urged towards said fixed arms, a sieve member surrounding said spindle as axis, and means to secure said sieve member relative to the length of said spindle.

The sieve member of the device according to my invention surrounds the spindle and may be to a greater or lesser extent elongated in form. Thus it may be of symmetrical cross-section, for example cylindrical or of square or hexagonal cross-section, and its length in an axial direction may be greater or less than its maximum transverse dimension, that is its diameter in the case of a cylindrical sieve member. Thus the proportions of such a sieve member may vary between an essentially tubular form at one extreme and a more drum-like (that is, squat) shape at the other.

My invention displays two advantageous features which may particularly be mentioned. First of all, the shape of the sieve member, which is known per se from US—A—3810547 but in another shipboard application, allows the sieve to present a larger sieving surface to the wash water than is normally possible using a flat strainer, whose dimensions are determined by those of the bilge well manhole. Because, in use, it may extend vertically from the bilge top, it is also less liable to uniform deposition of solid matter on its surface and therefore less readily choked by such matter. Secondly, the device may be installed by operation from the upper end of the spindle and it is therefore possible to mount the device securely upon the deck of the hold without the operator having to enter the bilge or otherwise secure the device from below the deck.

When it is desired to install the device according to the invention the threaded lower end of the spindle, with the retractable arms in their retracted position, is inserted through the bilge well manhole, the fixed arms being abutted against the deck surface. By rotation of the spindle, the retractable arms are moved to their extended position and urged towards the fixed arms so as to grip the adjacent decking between the retractable and fixed arms and thereby to hold the sieve member securely in position over the manhole.

As an optional further feature of my invention the sieve member may be sealed at its upper end by a solid or perforated lid. The lid may be removable to allow visual or other access to the bilge well.

The dimensions of the device of my invention are largely determined by the location in which it is to be used. Bilge well manholes are designed to meet Lloyd's requirements and tend therefore to conform to a limited number of designs. Thus a limited range of devices according to my invention may satisfy most needs. In one form of my invention, the sieve member may readily be exchanged for one of different dimensions or different perforation size, thereby significantly increasing the number of locations and situations in which the one device can be used.

The device according to my invention may be made of metal, for example of steel, and will thereby be suitable for use in a wide range of conditions. However for relatively gentle sea conditions or for use in port, the sieve member may be constructed in plastics material, for example in polypropylene or in glass-reinforced plastic.

My invention will now be further described with reference to the accompanying drawing, which illustrates, in vertical section, one preferred embodiment of the device according to my invention.

Referring to the drawing, the illustrated device is shown in position over a bilge access manhole 21 in decking 22. The device comprises a squat sieve member 23, which may be cylindrical or of square or hexagonal cross-section when viewed from above, held in position by a securing means designated generally by the numeral 24. The securing means is built about a vertical spindle 25, having threaded portions 25*a* and 25*b* and terminating at its upper end in a square-cross-section portion 25*c*.

From a boss 26 mounted free to rotate on the spindle 25, four radially-extending, square-cross-section, fixed arms 27 project, only two of these arms being visible in the drawings; the remaining two fixed arms extend radially at right angles to the arms shown. In the same vertical plane as the illustrated arms 27, two retractable arms 28 are disposed. The retractable arms 28 are pivotted at their radially innermost ends on a rocker bracket 29, which itself is pivotally mounted at 30 on an internally threaded member 31 engaging the threaded spindle portion 25*a*. The arms 28 are spaced from the adjacent arms 27 by struts 32, each strut 32 being pivotally joined to the arms 27 and 28 at its respective ends. As will be seen from the drawings, the angular position of the arms 28 relative to the fixed arms 27 is determined by the linear position of the rocker bracket 29 and threaded member 31 along the length of the threaded spindle portion 25*a*.

When it is desired to install the device in position for a hold cleaning operation, the securing means 24, with the rocker bracket 29 and arms 28 in the position shown in dotted line in the drawing, is placed within the sieve member 23 and then located over the manhole 21. The four fixed arms 27 rest upon a continuous, inwardly-directed flange 23*a* of the sieve member 23. A winding handle 33 is engaged over the spindle portion 25*c* and is used to rotate the spindle 25 and thereby cause the threaded member 31 and rocker bracket 29 to move downwards along the threaded spindle portion 25*a*. This movement causes the arms 28 to swing in the direction of the arrows until they engage the underside of the decking 22 in the position shown in solid line in the drawings. Pivotting of the rocker bracket 29 about the pivot 30 allows the device to compensate for local irregularities in the decking. In this position, the decking 22 is gripped between the four fixed arms 28 and the two retractable arms 27 and the device is thereby held firmly in place. A perforated lid 34 is now located around the spindle 25 within the top of the sieve member 23 and is locked in place by a knurled nut 35, which engages the threaded spindle portion 25*b*.

If, during the cleaning operation, it is desired to wash out or otherwise gain access to the bilges, this is readily achieved, without removing the device according to my invention, by simply unscrewing the nut 35 and removing the lid 34.

Claims

1. A device for use in the cleaning of cargo holds in ships comprising a spindle (25) having a threaded portion (25*a*) adjacent to a first end (the "lower" end), thereof, a boss (26) mounted upon said spindle (25) so as to rotate freely thereon but secured against movement relative to the length of said spindle, at least two fixed arms (27), projecting generally radially from said boss (26), an internally threaded member (31) engaging said threaded portion (25*a*) of the spindle 25, at least two retractable arms (28), pivotted at their radially inward ends to said threaded member and linked by struts (32) to corresponding fixed arms (27) so that said retractable arms (28) may, by movement of said threaded member (31) along the spindle (25), be movable between a retracted position of lesser radial extent and an extended position in which they are disposed essentially radially relative to said spindle and in which they are urged towards said fixed arms (27), a sieve member (23) surrounding said spindle (25) as axis, and means to secure said sieve member (23) relative to the length of said spindle.

2. A device as claimed in claim 1, wherein said means to secure said sieve member (23) relative to the length of said spindle (25) comprises an inwardly-directed flange (23*a*) on said sieve member.

3. A device as claimed in claim 1 or claim 2, wherein said retractable arms (28) are pivotted upon a rocker bracket (29) which is itself pivotted about a generally horizontal axis (30) upon said internally threaded member (31).

4. A device as claimed in any of the preceding claims, wherein the sieve member (23) is sealed at its upper end by a removable lid (34).

5. A device as claimed in claim 4, wherein said lid (34) is independently securable to said spindle (25).

Patentansprüche

1. Vorrichtung zur Verwendung bei der Reinigung von Frachtladeräumen in Schiffen, gekennzeichnet durch eine Spindel (25) mit einem Gewindeteil (25a) am unteren Ende, eine Nabe (26), die an der genannten Spindel (25) frei drehbar, jedoch gegen eine Längsbewegung gesichert, an der genannten Spindel (25) befestigt ist, mindestens zwei fest eingebaute Arme (27), die im allgemeinen radial von der genannten Nabe (26) nach außen verlaufen, ein mit einem Innengewinde versehenes Teil (31), das in den genannten Gewindeteil (25a) der Spindel (25) eingreift, mindestens zwei zurückziehbare Arme (28), die schwenkbar mit ihren radialen inneren Enden an dem genannten Gewindeteil und durch Streben (32) an den entsprechenden festen Armen (27) befestigt sind, so daß die zurückziehbaren Arme (28) durch Bewegung des genannten Gewindeteils (31) längs der Spindel (25) zwischen einer eingezogenen Stellung von geringer radialer Ausdehnung und einer ausgestreckten Stellung, in welcher sie sie im wesentlichen radial relativ zur genannten Spindel verlaufen und in welcher sie gegen die genannten festen Arme (27) gedrückt werden, bewegbar sind, ein Siebteil (23), welches die genannten Spindel (25) als Achse umgibt, und durch Einrichtungen zur Festlegung des genannten Siebteiles (23) relativ zur Länge der genannten Spindel.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Einrichtung zur Festlegung des genannten Siebteiles relativ zur Länge der genannten Spindel (25) aus einem nach innen gerichteten Flansch (23a) an dem genannten Siebteil besteht.

3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die genannten, zurückziehbaren Arme (28) an einer Kipphebelklammer (29) schwenkbar befestigt sind, welche selbst um eine im allgemeinen horizontale Achse (30) an dem genannten Teil (31) mit Innengewinde schwenkbar befestigt ist.

4. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Siebteil (23) an seinem oberen Ende durch einen entfernbaren Deckel (34) verschlossen ist.

5. Vorrichtung nach Anspruch 4, dadurch gekennzeichnet, daß der genannte Deckel (34) unabhängig von der genannten Spindel (25) sicherbar ist.

Revendications

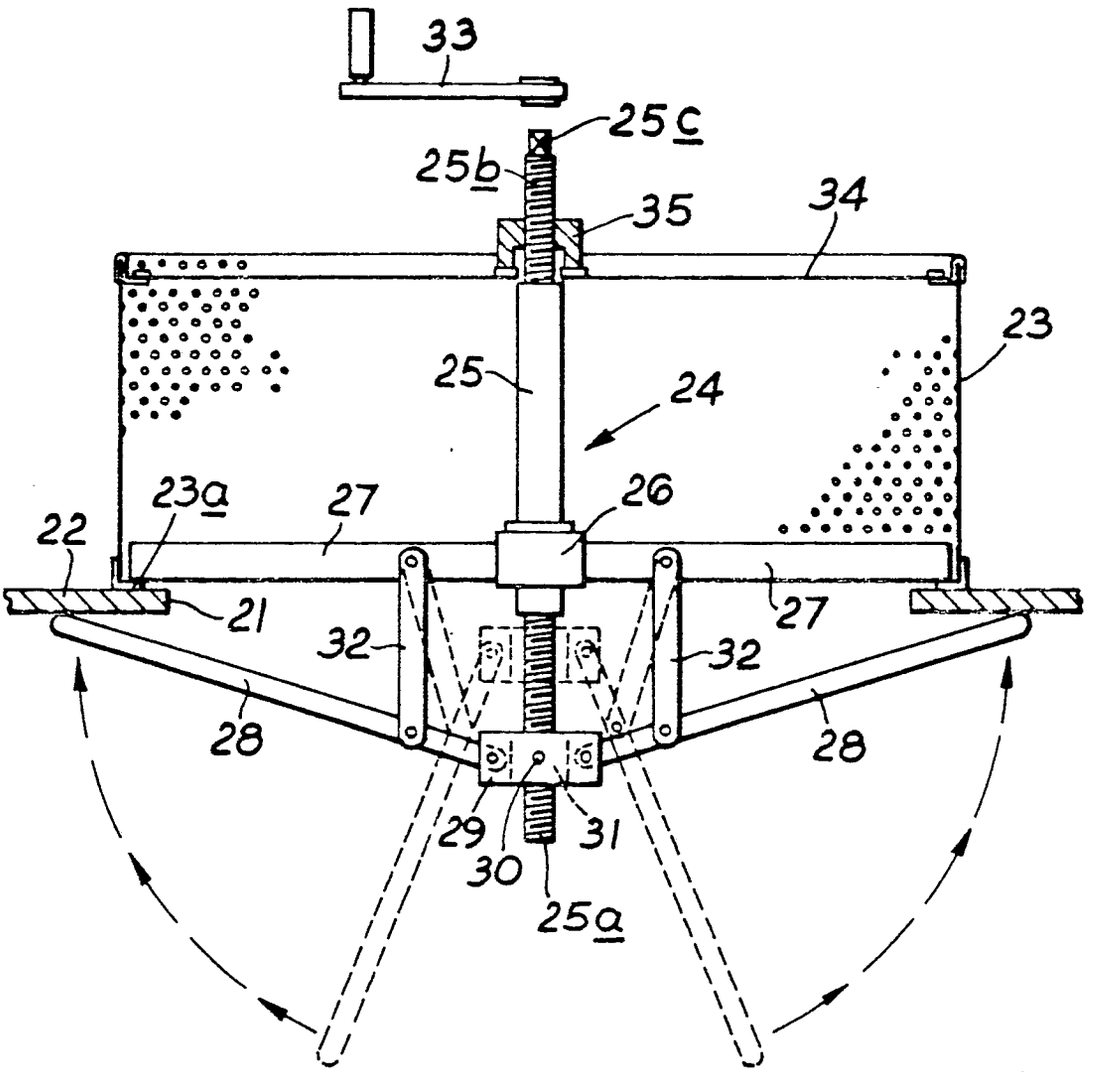
1. Appareil pour le nettoyage de soutes de navires, comprenant un axe (25) qui comporte une partie filetée (25*a*) adjacente à une première extrémité (l'extrémité inférieure) de cet axe, un moyeu (26) monté à rotation libre sur ledit axe (25), mais exempt de mouvements longitudinaux par rapport à ce dernier, au moins deux bras (27) dépassant généralement radialement à partir de ladite partie filetée (25*a*) de l'axe (25), au moins deux bras rétractables (28) dont les extrémités internes radiales sont articulées audit élément fileté, tandis qu'elles sont reliées par des entretoises (32) aux bras fixes correspondants (27), de telle sorte que lesdits bras rétractables (28) puissent, par le mouvement dudit élément fileté (31) le long de l'axe (25) passer d'une position rétractée d'une étendue radiale faible à une position développée dans laquelle ils sont poussés vers lesdits bras fixes (27), un élément de criblage (23) entourant ledit axe (25) qui constitue son axe géométrique et des moyens pour immobiliser ledit élément de criblage (23) en rapport avec la longueur dudit axe.

2. Appareil suivant la revendication 1, caractérisé en ce que ledit moyen pour immobiliser ledit élément de criblage (23) en rapport avec la longueur dudit axe (25) comprend un taquet (23*a*) tourné vers l'intérieur disposé sur ledit élément de criblage.

3. Appareil suivant les revendications 1 ou 2, caractérisé en ce que les bras rétractables (28) sont articulés sur un support basculant (29) qui est lui-même monté pivotant autour d'un axe généralement horizontal (30) dudit élément fileté intérieurement (31).

4. Appareil suivant l'une quelconque des revendications précédentes, caractérisé en ce qu'un couvercle amovible (34) ferme la partie supérieure de l'élément de criblage (23).

5. Appareil suivant la revendication 4, caractérisé en ce que ledit couvercle (34) est immobilisable indépendamment sur ledit axe (25).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