A portable storage chamber, including a collapsible pen forming the sidewalls of the chamber; and a lid arrangement of the chamber, lockable to enclose a top edge of the pen when the pen is erected; and at least one fitment provided on the chamber and fixable to a floor of a worksite.
SECURE STORAGE CHAMBER

[0001] The present invention relates to secure storage chambers and in particular to secure storage chambers suitable for storing work tools at a work site.

[0002] Construction workers generally require expensive tools, such as power tools, when working at a work site. These tools are susceptible to theft and so need to be locked away when unaccompanied. Such workers generally transport their tools to a worksite on a daily basis in a work vehicle, for example in a van. However, it is not safe to store expensive tools in a van as such vans are targets for thieves. Accordingly, such workers may have to store tools overnight in a secure location, for example at their homes, load them into their van at the beginning of the working day to transport them to work, transfer them to the worksite during the working day and then transport them home again at the end of the working day and store them again in a secure location. This is inconvenient and unnecessarily extends the working day. Often, the theft of such tools is opportunistic crimes, at times when tools are unsupervised at a worksite or when work vehicles storing such tools are inadvertently left unlocked and unattended.

[0003] In addition, power tools can be safety hazards at a worksite if left unattended and it requires significant effort for a power tool to be unplugged and safely stored away, each time it is not in use.

[0004] The problem of securely storing workmen’s tools in a van has been addressed in WO02/002391, which provides a secure carrying compartment within a van. The carrying compartment includes a metal frame which is bolted to the interior of a van and a series of metal panels which are hingedly connected to the frame. The panels can be assembled into a secure carrying compartment or folded away so as not to take up space within the van. This enables a construction worker to store tools in a van overnight, but does not solve the problem of secure tool storage at a worksite. A secure carrying compartment of the type provided by WO02/002391 is not easily portable, as it is bulky and heavy, and so is not suited for use at a worker’s worksite, the location of which may vary on a regular basis.

[0005] According to the present invention, there is provided a portable storage chamber, comprising a collapsible pen forming the sidewalls of the chamber; a lid arrangement of the chamber, lockable to enclose a top edge of the pen when the pen is erected, and at least one fitment provided on the chamber and fixable to a floor of a worksite. The storage chamber is collapsible, which makes it easily portable to and from worksites. Also, as the chamber is fixable to the worksite floor, any tools stored within the erected chamber, when the lid is locked and the chamber is fixed to the floor, are securely stored against opportunistic theft. In addition, the unlocked and open chamber provides a convenient place to locate tools, while a worker is working in the vicinity of the chamber, so avoiding the safety hazard of dangerous tools being scattered about a worksite.

[0006] The chamber according to the present invention does not have a permanent base, but instead the base of the chamber may be formed by the floor on which the chamber is erected. This makes the collapsing of the storage chamber according to the present invention simpler.

[0007] In order to improve the security of the storage chamber and to facilitate collapse of the chamber without the need to dismantle components of the chamber, the sidewalls of the chamber may be permanently connected to each other so as to form the pen. The sidewalls may be hingedly connected as this enables collapse of the pen in a convenient way by simply folding of the sidewalls of the pen together at the hinges.

[0008] The lid arrangement may comprise a panel which is permanently hingedly connected to a sidewall of the pen. This enables the storage chamber to be collapsed without having to dismantle the lid from the pen and without having a separate lid from the pen. This improves portability as the inconvenience of a separate lid which may fall off during transport of the chamber is avoided.

[0009] The lid arrangement may be of the type which is formed with a lip suitable for overlapping the top edge of the pen when the pen is erected. This overlap of the lip with the pen makes the locked storage chamber more secure and also provides a space within the lip for the pen to collapse into. The hinged connection may comprise one or more hinge elements, in which each hinge element is hingedly connected to the lid arrangement and which is hingedly connected to the sidewall. The use of such double hinge elements, enables the hinges to fold beneath the lip of the lid arrangement, so that the hinge elements are covered by the lip of the lid arrangement, when the lid is closed. This inhibits access to the hinge elements and so improves the security of the storage chamber against a person trying to break into it.

[0010] At least one lockable connector arrangement may be provided between a side wall of the pen and the lid arrangement. Many types of lockable connector arrangement are known in the art for locking the lid of a chamber over the sidewalls thereof. In particular, the lockable connector may comprise a loop fitted to one of the sidewall or the lid arrangement and a flange hingedly fitted to the other of the lid arrangement or sidewall and formed with a through hole for fitment over the loop. To lock the storage chamber the flange may be passed over the loop and a locking device, such as a padlock may then be passed through the loop and locked. Alternatively, the or each lockable connector may comprise a loop depending from the lid arrangement and a corresponding through hole in a rim portion formed above an open recess in the sidewall, wherein the lid is closed, the loop passes through the corresponding through hole in the rim portion and into the recess. Then a locking device, such as a padlock, can be passed through the loop so that the pad lock, when locked onto the loop resides in the recess. This reduces access to the padlock and helps to inhibit breaking of the padlock by force.

[0011] The or each fitment may be located conveniently at a bottom edge of the pen, which is adjacent to the floor in use of the chamber. The or each fitment may be formed as a flange formed with a through hole and hingedly connected at a bottom edge of the pen. There are many types of fitment which will be apparent to a person skilled in the art which could be used for fixing the chamber to the floor. For example, the fitment may be formed integrally with the sidewalls and extend therefrom. It is preferred that the fitments, such as the flanges, extend inwardly of the sidewalls and so are contained within the pen. This makes the fitments inaccessible when the storage chamber is locked shut and so more difficult for a thief to steal tools stored within the chamber. The through holes in the fitments may be reinforced by a liner, preferably, a metal liner.

[0012] The chamber may additionally include a detachable base, which can be releasably fitted within the pen of the chamber, when the chamber is erected, at the base of the pen,
adjacent the floor. For ease of storage, the detachable base may be releaseably fittable within the lid arrangement, when not in use.

[0013] The chamber may have four side walls, hingedly connected to each other so as to form an enclosure which may comprise: a pair rigid panels forming opposing primary sidewalls; and a pair of foldable panels forming opposing secondary sidewalls in which each secondary panel comprises at least one fold line extending from a bottom edge to the top edge of that panel. Then the pen of the storage chamber may be collapsed by folding the fold lines of the opposing secondary sidewalls towards each other and moving the primary sidewalls towards each other so as to entrap the folded secondary sidewalls between the primary sidewalls. This is an easy and convenient way to collapse the pen into a small volume, which may for example be fitted within the lid arrangement of the storage chamber. Each foldable panel may comprise a pair of rigid panels hingedly connected to each other at the centre of the foldable panel. Each foldable panel may comprise a release tab, which is engageable to facilitate folding of the foldable panel.

[0014] For ease of storage and portability, at least part of the pen may fit within the lid arrangement when the pen is collapsed. In particular, where the lid arrangement is formed with a lip, at least part of the collapsed pen may be fitted within the lip of the lid arrangement when the pen is collapsed. A releasable latch arrangement may then be provided between the lid arrangement and the collapsed pen for releasably latching the collapsed pen within the lid arrangement. The storage chamber is thus easily packaged within the lid arrangement for ease of storage and portability.

[0015] At least the sidewalls, a panel portion of the lid arrangement and optionally, the detachable base, may be formed from a tough plastic or plastics material. The material chosen is tough but lightweight and may for example be polycarbonate. As many thefts of tools are opportunistic it is not necessary for the sidewalls and lid panel to be made from a material, such as metal, through which it is very difficult to cut. The simple fact that the tools are stored within the chamber is likely to be deterrent enough. However, the material chosen should be as tough and difficult to cut through as is compatible with the material being lightweight, inexpensive and relatively easy to form, for example by moulding, into the desired formations. In order to toughen a material made from a mouldable plastic or plastics material, one or more layers of reinforcing fibres, such as aramid or carbon fibres, may be embedded within each panel.

[0016] The invention will now be described by way of example only and with reference to the accompanying schematic drawings, wherein:

[0017] FIG. 1 shows a perspective view of a first embodiment of a portable storage chamber according to the present invention in an erected position and with the lid open;

[0018] FIG. 2 shows a view from below of the portable storage chamber of FIG. 1 according to the present invention in an erected position and with the lid closed;

[0019] FIG. 3 shows a plan view of the sidewalls of the portable storage chamber of FIG. 1 as they are being collapsed;

[0020] FIG. 4 shows a side view of the storage chamber of FIG. 1 in a collapsed position in which the collapsed sidewalls are fitted within the lid arrangement;

[0021] FIG. 5 shows a perspective view of the storage chamber of FIG. 1 in an erected position and with the lid closed and locked;

[0022] FIG. 6 shows a section of sidewall of the storage chamber of FIG. 1, with a fitment extending from it and fixed to a floor surface with a fixing;

[0023] FIG. 7 shows a perspective view of a second embodiment of a portable storage chamber according to the present invention in an erected position and with the lid closed;

[0024] FIG. 8 shows a rear view of the storage chamber of FIG. 7 in an erected position;

[0025] FIG. 9 shows a view from below of the portable storage chamber of FIG. 7 in an erected position and with a detachable base fitted;

[0026] FIG. 10 shows a section of the back wall of the storage chamber of FIG. 7, with a fitment extending from it and fixed to a floor surface with a fixing;

[0027] FIG. 11 shows a view of the back of the storage chamber of FIG. 7 in a collapsed position;

[0028] FIG. 12 shows a front perspective view of the storage chamber of FIG. 7 in a collapsed position;

[0029] FIG. 13 shows a view of the handle end of the storage chamber of FIG. 7 in a collapsed position;

[0030] FIG. 14 shows a view of a side end of the storage chamber of FIG. 7 in a collapsed position;

[0031] FIG. 15 shows a view of the hinge end of the storage chamber of FIG. 7 in a collapsed position; and

[0032] FIG. 16 shows a perspective view of the storage chamber of FIG. 7 in an erected position and with the lid arrangement open.

[0033] FIGS. 1 to 6 show a first embodiment of a portable storage chamber (2) according to an embodiment of the present invention. The storage chamber (2) is formed from a collapsible pen (4) made from four sidewalls (6, 8, 10, 12). The sidewalls (6-12) are permanently hingedly connected to each other to form an enclosure so that when the pen (4) is erected, adjacent sidewalls are perpendicular to each other, so that the sidewalls (6-12) when viewed from above form a rectangle.

[0034] A lid arrangement (18) is provided which comprises a lid panel (20) which fits over the top edges of the sidewalls (6-12) when the pen (4) is erected. The lid panel (20) is permanently hingedly connected by a hinge arrangement (22) along one edge to the top edge of sidewall (8) of the pen. The remaining three edges of the lid panel (20) are formed with a lip (24), which when the pen is erected and the lid arrangement is shut, overlaps the outer surface of the sidewalls (6, 10, 12) adjacent the top edges of these sidewalls.

[0035] As is best shown in FIG. 5, the sidewall (6) is formed with a loop (26) which extends outwardly from the sidewalk (6) and which forms part of a lockable connector arrangement of the storage chamber (2). The lid arrangement is formed with a corresponding flange (28), which is permanently hingedly fitted to the lip (24) of the lid arrangement (18). The flange is formed with a through hole and the loop (26) and flange (28) are positioned on the storage chamber (2) so that the loop (26) will fit through the hole in the flange (28). Then to lock the storage chamber (2), the lid arrangement (18) is closed and the flange (28) is passed over the loop (26). Then a locking device, such as a padlock can be passed through the loop and locked, so as to lock the lid arrangement (18) to the pen (4). The flange (28) may be formed as an extension of the lip (24) of the lid arrangement.
[0036] A plurality of fitments (30) are provided on the chamber (2) which are fixable to a floor of a worksite. The fitments are formed as flanges (30), which are permanently hingedly connected to the bottom edge of the sidewalks (10, 12) of the pen (4). The flanges (30) may be extensions of the bottom edge of the sidewalks (10, 12). Each flange (30) is formed with a through hole, through which a fixing element (34) (See FIG. 6), such as a screw or bolt can pass in order to fix the chamber (2) to a floor (40) of a worksite. When the pen (4) is erected, the flanges (30) are directed inwardly within the pen so that when the pen (4) is erected with the bottom edges of the sidewalks (10, 12) resting on a floor surface, the flanges (30) extend substantially along the floor surface (40).

[0037] The sidewalks are permanently hingedly connected to each other along substantially the entire length of the connecting edges of adjacent sidewalks by hinge arrangements (16). Similarly, the lid panel (20) is permanently hingedly connected to sidewalk (8) along substantially the entire length of the connecting edges of the sidewalk (8) and lid panel (20) by hinge arrangement (22). Many hinge arrangements are known in the art for hingedly connecting plastic panels. For example, the hinge arrangements may be formed from the same material as the sidewalks and lid, but as a line of reduced panel thickness extending along and between the edges of adjacent panels. Reducing the thickness along a line in a surface of a panel of plastic, so as to form a line of reduced panel thickness, can enable that panel to bend along that line, thus forming a hinge arrangement at that line. Alternatively, the panels may be formed with hooks or tube formations along their adjoining edges, which formations fit around a metal pin to form a hinge arrangement. The flange (28) may be formed as an extension to the edge of the lip (24) and the flanges (30) may be formed as extensions to the edge of their adjacent sidewalk (10, 12). Where the flanges are required to pivot relative to the edge, a hinged connection between the flanges (28, 30) and their respective edges can be formed by a line of reduced panel thickness in the same way as is described above.

[0038] The chamber (2) has four sidewalks (6-12) forming the collapsible pen (4), which are described above as hingedly connected to each other so as to form an enclosure. The pen is formed of a pair of primary sidewalks (6, 8) each formed from a rigid panel and which form opposite sides of the pen (4). The other two secondary sidewalks (10, 12) are formed from a pair of foldable panels, which again form opposite sides of the pen (4). The primary sidewalks are longer than the secondary sidewalks. The secondary panel (10) is formed with a fold line (32), which bisects the panel (10) extending, substantially vertically (when the pen (4) is erected and standing on a floor) from the bottom edge of the panel (adjacent to the floor) to the top edge of the panel (adjacent to the lid arrangement (18)). Two rigid half panels (10a, 10b) extend to either side of the fold line (32). Similarly, the secondary panel (12) is formed with a fold line (32) which bisects the panel (12) extending, substantially vertically (when the pen (4) is erected and standing on a floor) from the bottom edge of the panel (adjacent to the floor) to the top edge of the panel (adjacent to the lid arrangement (18)). Two rigid half panels (12a, 12b) extend to either side of the fold line (32). The fold lines (32) may be formed as hinges or as lines of reduced panel thickness in a similar way as is described above.

[0039] The pen (4) is collapsed as is shown in FIGS. 3 and 4. The fold lines (32) of the opposing secondary sidewalks (10, 12) are folded towards each other which in turn pulls the primary sidewalks (6, 8) towards each other. In this way the folded secondary sidewalks (10, 12) become entrapped between the primary sidewalks (6, 8), as is shown in FIG. 4. The collapsed sidewalks (6-12) are then folded into the lid arrangement (18) by making a fold at the hinge arrangement (22) between the sidewalk (8) and the lid panel (20), so that the sidewalk (8) lies against the lid panel (20). In this way the pen (4) is collapsed and fitted within the lid arrangement (18) by the folded sidewalks (6-12) fitting within the lip (24) of the lid arrangement.

[0040] A bead (36) is formed along the whole or part of the edge of the lip (24) remote from the lid panel (20), which bead extends inwardly of the edge of the lip (24). The lip (24) of the lid arrangement (18) is deformable and so the bead (36) acts as a latch for releasably latching the collapsed pen (4) within the lid arrangement (18). As the pen (4) folds into the lid arrangement (18), the primary side panel (8) lies on top of the lid panel (20) and the primary sidewalk (6) lies above the panel (8) entrapping the folded secondary panels (10, 12) therebetween. The edges of the primary side panel (6) are pushed past the bead (36) so as to releasably latch the pen (4) within the lid arrangement (18).

[0041] This arrangement whereby the pen collapses and is releasably latchable within the lid arrangement (18) makes the portable storage chamber according to the present invention easily portable. A handle (38) may be provided on an external side of the lip (24) of the lid arrangement, so as to facilitate portability of the collapsed chamber (2).

[0042] The releasable latch of the collapsed pen (4) within the lid arrangement (18) may be done in many different ways, which will be apparent to a person skilled in the art.

[0043] The sidewalks (6-12) and the lid panel (20) are preferably made of a tough but lightweight material, such as plastic or plastics material. For example, they may be made of polycarbonate. As many thefts of tools are opportunistic it is not necessary for the sidewalks (6-12) and lid panel (20) to be made from a material, such as metal, through which it is very difficult to cut. The simple fact that the tools are stored within the chamber is likely to be deterrent enough. However, the material chosen should be as tough and difficult to cut through as is compatible with the material being lightweight, inexpensive and relatively easy to form, for example by moulding, into the desired formations. In order to toughen a material made from a mouldable plastic or plastics material, one or more layers of reinforcing fibres, such as aramid or carbon fibres, may be embedded within each panel.

[0044] A worker can easily transport a storage chamber according to the present invention to and from a worksite, because the chamber is lightweight, and folds into an easily carried collapsed position, as shown in FIG. 4.

[0045] On arrival at the worksite, with the collapsed storage chamber, a worker unlatches the pen (4) from within the lid arrangement (18) and pivots the sidewalk (8) to a position in which it is perpendicular to the lid panel (22). The worker can then unfold the sidewalks (6-12) of the pen by pulling the primary sidewalk (6) away from the opposing primary sidewalk (8) so as to unfold the secondary sidewalks (10, 12). In this way the pen (4) is erected into a rectangular enclosure. The pen (4) is then upturned so that the bottom edges of the sidewalks (10, 12) from which the flanges (30) extend are resting on the floor of the worksite, with the flanges (30) directed inwardly towards the centre of the enclosure. The workman then positions the pen (4) in a desired position at the worksite. The workman then drills four holes into the floor
(40) at the worksite in positions aligned with the through holes (31) of the flanges and fixes the pen (4) to the worksite floor. This may be done using headed fixings (34) which have a fixing end which extends into and engages the hole in the floor and a head which overlies the flange (30) to secure the flange to the floor. Many such suitable fixings are well known in the art, which can be released after use by access to the head of the fixing.

[0046] With the lid arrangement (18) open as shown in FIG. 1, the worker then loads tools, for example power tools into the storage chamber (2). While the worker is working in the vicinity of the storage chamber (2), the chamber can be used with the lid arrangement (18) open as a safe place to store tools. This means that tools which can cause a safety hazard are not scattered about the worksite.

[0047] When the worker leaves the vicinity of the storage chamber, the tools are packed within the chamber and the lid arrangement (18) closed and locked to the pen (4) as shown in FIG. 5. This should be sufficient deterrent to prevent theft of the tools by opportunist thieves. The storage chamber (2) should be secure enough, in combination with worksite security to store tools in overnight without significant risk of theft. This saves the worker from having to transport heavy tools home at the end of each workday for secure storage offsite and from having the return with the tools to the worksite the following workday. Because the storage chamber (2) is securely fixed into the floor of the worksite, and the fixings (34) are not accessible, it is very difficult to remove the storage chamber (2) from the worksite or to prize it off the floor without specialist tools. The lockable connector (26, 28) is made sufficiently secure to make the breaking of it difficult without specialist tools. Also, the sidewalls (6-12) and the lid panel (20) are made of sufficiently tough plastic to make cutting through the sidewalls or lid panel or breach of the hinges (16, 32, 22) difficult without specialist tools.

[0048] Then when the worker has completed work at the worksite, generally after a period of at least several days, the storage chamber (2) is removed from the worksite. The fixings (34) are released or prized out of the holes in the floor. The pen (4) can then be folded and latched into the lid arrangement (18), as described above and the collapsed chamber easily removed from the worksite.

[0049] FIGS. 7 to 16 show a second embodiment of a portable storage chamber according to an embodiment of the present invention. Like parts of the second embodiment are identified in FIGS. 7 to 16 by like numerals from FIGS. 1 to 6 of the first embodiment. The first and second embodiments are similar and generally are set up, collapsed and fixed to the floor in the same way. The description below in relation to the second embodiment, highlights the differences between the first and second embodiments.

[0050] In the second embodiment, the lid arrangement (18), walls (6, 8, 10, 12) and double pin hinges (22a to c) may be moulded, for example injection moulded, from a material, such as polycarbonate. The metal parts, such as the hinge pins (52, 58) and reinforcing tubes (29), may for example be made from stainless steel.

[0051] FIG. 7 shows the second embodiment of the storage chamber in an erected position, with the lid arrangement (18) closed. The rim of the lid (24) is wider in a portion (24a) which is located at the back of the chamber, adjacent the rear wall (8) and narrower in a portion (24b) which is located around the remaining three side walls (10, 6, 12).

[0052] As can be seen in FIG. 7, the hinge arrangement (32), which hingedly connects the rigid side panels (12a, 12b), so as to form the sidewall (12) is formed of two hinges (32a, 32b). A similar hinge arrangement connects the rigid side panels (10a, 10b) of the opposite sidewall (10). Each hinge (32a, 32b) comprises a pair of spaced hinge tubes (33a) moulded into the edge of one of the side panels (12a) and a cooperating hinge tube (33b) moulded into the edge of the other side panel (12b). When the edges of the side panels are placed together, the cooperating hinge tube (33b) fits in the space between the associated pair of spaced hinge tubes (33a), so that the hinge tubes together form a composite hinge tube within which a metal hinge pin is located. The lid portion (24b) covers the top of the hinge (32a) when the lid arrangement is closed, so as to provide extra security against a person attempting to break into the storage chamber.

[0053] FIG. 7 also shown the handle (38) of the storage chamber, which handle is moulded into the lid arrangement (18).

[0054] FIG. 8 shows more detail of the rim portion (24a) at the rear of the lid arrangement (18). The rim portion (24a) is wide enough, to cover three hinges (22a to c) (described below in relation to FIG. 11) when the lid arrangement (18) is closed. The three hinges (22a to c) hingedly connect the lid arrangement (18) to the back panel (8) of the chamber. In between the hinges (22a to c), the rim portion (24a) is formed with cut-outs. The covering of the hinges (22a to c) with the rim portion (24a) when the lid arrangement is closed provides extra security against a person attempting to break into the storage chamber.

[0055] FIG. 9 shows from below the lower rim of the chamber, which lower rim is placed on the floor of a work site, when the chamber is erected. It also shows the fitments (30) two of which are moulded as part the lower rim of the front wall (6) and two of which are moulded as part of the lower rim of the back wall (8) of the chamber. The fitments (30) extend from the walls (6, 8) towards the centre of the chamber and are formed with a receiving hole. Each receiving hole extends from an upper surface of each fitment (30) to a lower surface of each fitment. A tubular metal liner (29) is moulded into each of the through holes, so as to reinforce the through holes. For example, the tubular metal liners may be made of stainless steel. The presence of the liners (29) protect the fitments against wear due to the fitments (30) being repeatedly connected to and then released from different worksite floors, by fixing elements (34), as is shown in FIG. 10.

[0056] FIG. 9 also shows a detachable base (80). When not in use the detachable base can be fitted within the lid arrangement (18) of the storage chamber. The detachable base (20) can be releasably snap fitted into the lid arrangement via a plurality of flexible latches (82), two of which are shown in FIG. 16. There may be a total of four such flexible latches, with a pair on the opposite side of the lid arrangement to those shown in FIG. 16. The flexible latches (82) engage a plurality of cooperating latch slots (84), which are formed in the detachable base (80). When it is required to be used, the detachable base (80) is released from the flexible latches (82) and placed in the bottom of the chamber, as shown in FIG. 9. Therefore, when the chamber is fixed to the floor of a worksite, via the fitments (30), with the base placed in the bottom of the chamber, the base will be adjacent the floor. The detachable base (80) is moulded from the same material as the remainder of the chamber wall and is shaped, on its underside, with four recesses (86), which are shaped to fit over the
fitments (30). The fitting of the base (80) in the chamber, promotes the integrity of the chamber, by preventing the side walls (10, 12) from being folded in, even by a small amount, and so helps to support the role of the fitments (30), which when fixed to the floor, prevent collapse of the chamber. When the chamber is collapsed, the detachable base (80) can be lifted from the base of the chamber and stowed in the lid arrangement (18).

[F0057] FIG. 11 shows the double pin hinges (22a to c), which are used to hingedly connect the lid arrangement (18) to the rear wall (8) of the storage chamber. Each of the double pin hinges (22a to c) may be moulded from the same material as the remainder of the storage chamber and may be moulded in a U-shape. A first hinge tube is formed along the cross bar (50) within which is received a first hinge pin (52). Spaced apart portions of a second hinge tube are formed across the ends of the arms (54a, 54b) of each double pin hinge (22a to c). Three cooperating hinge tubes (56), one for each double pin hinge (22a to c) are formed along the edge of the wide rim portion (24a) (See also, FIG. 15). Each co-operating hinge tube (56) fits between the spaced hinge tubes formed across then ends of the arms (54a, 54b) of an associated one of the double pin hinges (22a to c), so as to form a composite hinge tube through which a second hinge pin (58) passes. The hinge pin (58) passing through the composite hinge tube hingedly connects the double pin hinge (22a to c) to the lid arrangement (18). Three recesses are formed in the surface of the back wall panel (8), each for receiving one of the three double pin hinges (22a to c). Each first pin hinge (52) extends from both ends of the cross-bar (50) of the associated double pin hinge (22a to c) into a pair of cooperating receiving holes formed in opposing side walls of the associated recess in the back wall panel (8), so as to hingedly connect the double pin hinge to the back wall panel (8) of the chamber. Thus, the lid arrangement (18) is hingedly connected to the back wall panel (8) of the chamber via the three double pin hinges (22a to c). The use of such double pin hinges (22a to c) enables the hinges to be folded under the wide portion (24a) of the rim of the lid arrangement (18) when the storage chamber is erected with the lid arrangement closed (See FIG. 15). This further enhances the security of the storage chamber, as the double pin hinges (22a to c) are inaccessible to a person trying to break into the chamber.

[F0058] FIGS. 12 to 15 illustrate the compactness of the storage chamber according to the second embodiment, in its collapsed position.

[F0059] FIG. 16 shows a detachable storage pocket (60), which can be releasably fitted to the upper edge of the front wall panel (6) of the storage chamber, via a pair of hooks (62) which extend from the storage pocket (60) and which may snap fit over cooperating recesses formed in the upper edge of the front wall panel (6). The pocket (60) may be used, for example, to house a pair of pad locks, which are used to lock the lid arrangement (18) to the front wall panel (6) of the storage chamber.

[F0060] With reference to FIGS. 7 and 16, a pair of recesses (64), are formed in the front wall panel (6) of the chamber. The recesses (64) are each bounded at their upper end by a rim portion (66). An oval through hole (68) is formed through each of the rim portions (66) to extend from an upper surface to each rim portion into the upper end of the associated recess (64). As shown in FIG. 7, a pair of metal plate arrangements (70) from each of which extends a closed U-shaped metal loop (72) (shown in dotted lines in FIG. 7), is fixed into the lid arrangement (18), with the loops facing downwardly. The metal plate (70) in FIG. 16 is shown for illustrative purposes only and in use should be fixed to the lid arrangement, as is shown in FIG. 7. The positioning of the metal plates (70) in the lid arrangement corresponds to the through holes (68) in the rim portions (66) of the front wall panel (6). Then when the lid arrangement (18) is closed, with the chamber in the erected position, the metal loops (72) of the plates (70) pass through the corresponding through holes (68) in the rim portions (66) so that the metal loops extend into the upper ends of the recess (64) in the front wall panel (6). A padlock (74) is then passed through each of the metal loops (72) so as to secure the lid arrangement to the front wall panel (6) of the chamber.

[F0061] FIG. 16 also shows tab extensions (80), which are pushed inwardly to initiate collapsing of the chamber. Each tab extension (80) is formed on the end of an arm that extends from the side of one of the side panels (10, 12) and over the hinged connection between the pairs of side panels (10a, b and 12a, b). The tab extensions (80) extend upwardly from the arms so as to extend above the top of the side walls (10, 12). To collapse the chamber, the two tab extensions (80) are pushed inwardly, towards each other, in order to fold the sidewalls (10, 12) inwardly.

[F0062] With the storage chamber erected, the detachable base (80), if used, is removed and fitted into the lid arrangement. Then the fixings (34) are removed from the fitments. The tab extensions (80) are then pushed in order to begin folding of the opposing secondary sidewalls (10, 12). This in turn pulls the primary sidewalls (6, 8) towards each other. In this way the folded secondary sidewalls (10, 12) become entrapped between the primary sidewalls (6, 8), as is shown in FIG. 4. The collapsed sidewalls (6-12) are then folded into the lid arrangement (18) by making a fold at the double pin hinges (22a to c) between the sidewall (8) and the lid panel (20), so that the sidewall (8) lies remote from the lid panel (20) and the sidewall (6) lies adjacent the panel, with the folded secondary sidewalls (10, 12) trapped therebetween. In this way the pen (4) is collapsed and fitted within the lid arrangement (18).

1. A portable storage chamber, comprising: a collapsible pen forming the sidewalls of the chamber; and a lid arrangement of the chamber, lockable to enclose a top edge of the pen when the pen is erected; and at least one fitment provided on the chamber and fixable to a floor of a worksite.
2. A chamber according to claim 1 wherein the sidewalls of the chamber are permanently connected to each other so as to form the pen.
3. A chamber according to claim 1 wherein the sidewalls are hingedly connected so as to form the pen.
4. A chamber according to claim 1, wherein the lid arrangement comprises a panel permanently hingedly connected to a sidewall of the pen.
5. A chamber according to claim 4 wherein the hinged connection comprises one or more hinge elements, in which each hinge element is hingedly connected to the lid arrangement and is hingedly connected to the sidewall.
6. A chamber according to claim 1, wherein the lid arrangement is formed with a lip suitable for overlapping the top edge of the pen when the pen is erected.
7. A chamber according to claim 6, wherein the hinged connection comprises one or more hinge elements, in which each hinge element is hingedly connected to the lid arrange-
ment and is hingedly connected to the sidewall, and wherein the lip encloses the or each hinge element when the lid is closed.

8. A chamber according to claim 1, wherein at least one lockable connector arrangement is provided between a side wall of the pen and the lid arrangement.

9. A chamber according to claim 8 wherein the or each lockable connector comprises a loop fitted to one of the sidewall or the lid and a flange hingedly fitted to the other of the sidewall or the lid and formed with a through hole for fitment over the loop.

10. A chamber according to claim 8 wherein the or each lockable connector comprises at least one loop depending from the lid and one or more corresponding through holes in one or more rim portions formed in the upper end of the sidewall, with each rim portion formed above a recess in the sidewall, wherein when the lid is closed, each loop passes through the corresponding through hole in the rim portion and into the or one of the recesses.

11. A chamber according to claim 1, wherein the or each fitment is located at a bottom edge of the pen.

12. A chamber according to claim 1, wherein the or each fitment is formed as a flange formed with a through hole.

13. A chamber according to claim 12 wherein the or each through hole is reinforced with a liner.

14. A chamber according to claim 1, wherein the or each fitment extends inwardly from the sidewalls of the pen.

15. A chamber according to claim 1, additionally including a detachable base, which can be releaseably fitted within the pen of the chamber, at the base of the pen.

16. A chamber according to claim 15 wherein the detachable base can be releaseably fitted within the lid arrangement, when not in use.

17. A chamber according to claim 1 having four side walls, hingedly connected to each other so as to form an enclosure and comprising: a pair rigid panels forming opposing primary sidewalls;

a pair of foldable panels forming opposing secondary sidewalls; and each foldable panel comprising at least one fold line extending from a bottom edge to the top edge of that panel, wherein the pen is collapsed by folding the fold lines of the opposing secondary sidewalls towards each other and moving the primary sidewalls towards each other so as to entrap the foldable secondary sidewalls between the primary sidewalls.

18. A chamber according to claim 1, wherein the pen fits at least partly within the lid arrangement when the pen is collapsed.

19. A chamber according to claim 18, wherein at least part of the pen fits within the lip of the lid arrangement when the pen is collapsed.

20. A chamber according to claim 18, wherein a releasable latch arrangement is provided between the lid arrangement and the collapsed pen for releasably latching the collapsed pen within the lid arrangement.

21. A chamber according to claim 17, wherein each foldable panel comprises a pair of ridged panel members hingedly connected to each other at the centre of the foldable panel.

22. A chamber according to claim 17, wherein each foldable panel comprises a release tab, which is engageable to fold the foldable panel.

23. A chamber according to claim 1, wherein at least the sidewalls and a panel portion of the lid arrangement are formed from a tough plastic or plastics material.

* * * * *