

Sharps Collector

Field of the Disclosure

5 The present disclosure relates to a container for waste material and particularly medical waste material such as sharps which have been contaminated.

Background

10 The safe and efficient removal of contaminants in the surgical and clinical setting is important to all healthcare professionals to protect workers against accidental injury and disease from exposure to such contaminated waste. Particularly problematic waste material includes sharps such as knives, blades and hypodermic needles.

15 Disposal containers have been developed over the years which provide a reasonable degree of safety for disposable sharps and other medical waste articles.

20 Certain containers have lids to prevent the spilling of the contents from the container if it is knocked over. Such lids may be made from a polymer material and hinged relative to the body of the container. As such, over the life of the container there is a risk that the hinge fatigues and ultimately breaks which would render the container lidless with a risk of partial or full spillage of the contents.

25 Furthermore, in certain countries there has been an increase in re-cycling of medical equipment including medical waste disposal containers. Clearly the re-use of such containers would involve the emptying of the contaminated contents which results in significant risk to the party undertaking the activity in addition to potentially damaging the container, rendering it unsafe for future users.

30 There is a need for a safe and efficient container to dispose of waste material in a medical/surgical setting which has mechanisms to allow the safe disposal of waste without the risk of spillage of the contents and to substantially prevent the re-use of the container.

35 Any discussion of documents, acts, materials, devices, articles or the like which has been included in the present specification is not to be taken as an admission that any or all of these matters form part of the prior art base or were common general

knowledge in the field relevant to the present disclosure as it existed before the priority date of each claim of this application.

Summary

5

One aspect comprises a container including:

a receiver portion having an aperture to receive at least part of a disposable object;

10 a door structure moveable between a substantially closed configuration and an open configuration;

said door structure moveable to said open configuration by relative insertion of said object into said aperture;

a cutting member to cut off at least a portion of said object from the remainder of said object;

15 wherein when the doors are in said closed configuration the cutting member is prevented from engaging with said object and when said doors are in said open configuration the cutting member is engageable with said object; and

a receptacle to receive and house said cut off portion of said object.

20

A further aspect comprises a container including:

a receiver portion having an aperture to receive at least part of an object to be disposed;

a door structure moveable between a substantially closed configuration and an open configuration to receive at least part of said object;

25 a cutting member to cut off at least a portion of said object from the remainder of said object;

a receptacle to receive and house said cut off portion of said object, said receptacle having a base and a lid, said cutting member connected to said receptacle;

30 wherein at least partial removal of the lid member from the base releases said cutting member from its engagement with said receptacle.

In another aspect, there is provided a kit comprising:

a plurality of needle members; and

a container comprising;

35 a receiver portion having an aperture to receive at least part of at least one of the needle members;

a door structure moveable between a substantially closed configuration and an open configuration;

said door structure moveable to said open configuration by relative insertion of said at least one needle member into said aperture;

5 a cutting member to cut off at least a portion of said at least one needle member from the remainder of said object;

wherein when the doors are in said closed configuration the cutting member is prevented from engaging with said at least one needle member and when said doors are in said open configuration the cutting member is engageable with said at least one
10 needle member; and

a receptacle to receive and house said cut off portion of said needle member.

In a further aspect, there is provided kit including:

15 a plurality of needle members; and
a container comprising;

a receiver portion having an aperture to receive at least part of at least one of said needle members;

a door structure moveable between a substantially closed configuration
20 and an open configuration to receive at least part of at least one of said needle members;

a cutting member to cut off at least a portion of said at least one needle member from the remainder of said object;

a receptacle to receive and house said cut off portion of said at least one
25 needle member, said receptacle having a base and a lid, said cutting member connected to said receptacle;

wherein at least partial removal of the lid member from the base releases said cutting member from its engagement with said receptacle.

30 Typically the cutting member is positioned on said lid.

The container is typically a sharps disposal container to receive contaminated medical or surgical sharp objects. An example of a part of an object to be disposed of is a needle assembly comprising the needle shaft and a hub of a needle.

35

The container generally comprises a receiver portion which relatively receives a part of a receptacle. The receiver portion and receptacle may be connectable to each other, for example through one or more hinges, and moveable relative to one another. In this regard, these two components may be biased in a first non-cutting position relative to one another. In this position, a majority of the receptacle can be spring biased substantially away from the receiver portion.

The receptacle may comprise a main body and a lid. To avoid tampering of the receptacle, the lid may be securely connected to the main body.

One or more hinges may be provided to connect the receiver portion and the receptacle. The hinges can be provided by snap-lock engagements. For example, an indent may protrude either from the receptacle or receiver portion and snap-fit into a receiver portion in the other portion.

The receptacle may further include at least one spring member extending therefrom. The spring member biases the container in a first non-cutting position but allows the container comprising the receiver portion and receptacle to be compressed when appropriate to do so.

The container includes a door structure. The door structure is movable between a substantially closed configuration and an open configuration. The door structure may comprise a plurality of door members, for example two opposing door members. Each door member can be relatively moveable from a closed configuration to an open configuration. The door members may be made from a resiliently flexible material. They may be spring mounted on an internal surface of the receiver portion.

In one embodiment, the door members may be biased in a closed configuration relative to one another. In this manner, the doors provide a barrier to spillage of the contaminated contents from within the container.

Each door member may comprise a main body. The main body of one door member may have a concave abutment edge. The main body of the other door member may have a convex abutment edge. The concavity and convexity of the respective edges can be complementary such that when the door structure is in a closed

configuration, the two abutment edges may form a substantially tight seal at an abutment interface.

Both of the door members may have a distal edge at an end distal the abutment interface. Each of these edges may be connected to a spring structure. The spring structure may extend from the distal edge to a fixation member. The fixation member can be mounted to a post extending downwardly from an inner surface of the top wall of the receiver portion.

Each spring structure can comprise two relatively flexible, curved and elongate arms. These arms may be configured to at least partially bow outwardly relative to each other as the door members move relatively apart from each other.

The abutment interface formed when the door members are in their closed configuration typically substantially aligns inferiorly with an aperture that extends through the top wall of the receiver portion.

Opening of the door members relative to each other may be initially achieved in one embodiment by the force of an object, for example a needle shaft, against the abutment interface. As the tip of a needle shaft is pressed against the abutment interface, the door members may be prised apart relative to one another. The resultant gap caused by this prising apart enables the needle shaft to pass therethrough. The hub of a needle has a greater diameter than the needle shaft therefore as the hub moves into the gap it pushes the door members further apart and further out of their normally biased closed position. The force of the needle and the hub against the abutment edges of each door member together with the feature that each spring arm is fixed at its respective fixation member may cause a greater bowing out or flexing out of the arms as they are compressed between the main bodies of the door members and the fixation members.

Each upper surface can have a hub receiving recess. These may be adjacent to the respective abutment edges. The hub receiving recesses of each door member allows both a longitudinal and a radial force against the door members as required to open each door member relative to one another.

The door members are typically substantially recessed within the container so making it relatively difficult, if not impossible, for a user to physically touch the door members in normal use. This feature may have the further benefit that the door structure is at least partially shielded from damage resulting from relatively high drop impact forces.

Where the disposable object is a syringe or the like, it is desirable that the hub of the syringe is cut rather than the metal shaft of the needle. To ensure that the hub rather than the needle shaft is cut, the door structure may be configured such that the door members are opened to a fully open position only upon positioning of the hub member between the two abutment edges of the door members. Only in said fully open position is a cutting pathway for a cutting mechanism defined therebetween.

The cutting member may be positioned in, on or adjacent to the lid of the receptacle. The cutting member may be a blade having a fixed end and extending to a free cutting edge.

The blade may further be mounted on a safety connection said safety connection typically comprising a platform which has the blade mounted thereon. The safety mechanism may also comprise one or more depending legs which have an attachment flange to secure the safety connection to the receptacle. The attachment flange may be received in a catch member extending from a sidewall of the receptacle. The attachment flange can be tapered and once forced beyond the catch member, the legs are not readily removable from the receptacle.

The platform may be removably attached to the lid of the receptacle by one or more tear off tabs. The cutting member may be partially but securely sandwiched between the platform and a recess formed in the inner surface of the lid and shaped to match that of the cutting member. This sandwiching of the cutting member can serve to hold it in place during normal use. Other fixation means may be employed to augment the connection. For example, adhesive may be used to attach the cutting member to the platform.

Tampering of the container such as an attempt to remove the lid from the main body can break the tear off tabs and also break the connection between the platform of

the safety connection and the receptacle lid. With the platform released from the lid, the cutting member is also released and typically falls into the main body.

5 While the above mechanism renders the device inactive due to tampering (typically tampering to allow a user to re-use the device following the emptying of its contents), a user may also deliberately de-activate the container to prevent its re-use. In this regard, the lid may comprise an aperture at a location superior to at least part of the cutting member and the platform. Insertion of an object through the aperture and application of force down upon the cutting mechanism and the platform can break the
10 connection formed by the break off tabs between the platform and the lid and the cutting member is released into the main body. Release of the cutting mechanism in this manner may also have the advantage of allowing its subsequent controlled removal to facilitate the re-cycling of the plastic material of the remainder of the container.

15 The lid of the receptacle typically defines a cut-out aperture therein. The cutting member at least partially extends from the platform of the safety connection and into this aperture such that the free cutting edge is positioned in said cut-out aperture. Part of the cut out aperture is partially circular. This partially circular portion is substantially aligned inferiorly with the aperture of the receiver portion when the
20 container 10 is in a non-cutting configuration. Its partial circular shape is at least partially complementary to the outer surface of a hub of a needle. When a syringe is inserted into the container, its hub is substantially positionable within the partially circular portion.

25 In one embodiment, the partially circular portion is dimensioned to receive the hub of a syringe up to a certain diameter. If a user attempts to insert a needle assembly further into the container, the size restrictions imposed by the aperture in the receiver portion and/or the space between the fully open door members and/or the partially circular portion of the cut out portion of the lid will prevent any part of the syringe
30 having a greater diameter than the hub from being moved through the container.

However, in one embodiment of the container the aperture of the receptacle may be relatively enlarged to receive not only the needle hub but also the distal end of the syringe Luer. In this embodiment, both the Luer tip and the needle hub may be cut
35 which has the result of disabling both the syringe and the needle.

In use, once a hub is positioned within the partially circular portion of the lid, it may be substantially fixed in place and as the receptacle is pushed relatively towards the receiver portion the fixed hub may be engaged by the cutting member and cut from the remainder of the needle assembly.

5

An important feature of the presently disclosed container is that the cutting member is prevented from cutting the needle or hub until the door members are in their fully open position. Once fully open, the abutment edges door members define a curved cutting pathway to receive the cutting member. A curved cutting pathway may be desirable due to the pivot pathway of the cutting member on the receptacle as it pivots towards the receiver portion.

A cutting block may be provided on and extend upwardly from the upper surface of the lid. The cutting block may be located adjacent the cut-out aperture of the lid. If the door members are not fully opened to define the curved cutting pathway, the cutting block typically abuts with at least one sidewall of one or both door members, thereby providing an interlock and preventing the cutting member moving relatively forward as the container is compressed.

When the hub of the needle fully opens the door members and is positioned in the partially circular cut out portion, the interlock is substantially disabled because there is no abutment between the cutting block and the door members.

Other interlock mechanisms can be envisaged. For example, the door members may comprise one or more depending pins which are receivable within slots in or adjacent to the cutting blade when the door members have been fully opened. When the door members are closed or only partially opened, the blade or an area adjacent to the blade abuts the pins thereby preventing cutting.

The receptacle may further comprise one or more internal ribs which extend from an internal surface of a sidewall and form a slope onto which discarded needle parts or other sharps may fall. Such ribs enhance stacking of discarded needle parts in the main body of the receptacle. In this regard, the ribs may position the discarded needle part off centre. Keeping the centre of main body substantially free from discarded needles and hubs provides an insertion zone for newly inserted needles and hubs. A user will preferably not feel any resistance against discarded material in the

main body at least until the needle is fully inserted into a cutting position and/or until the main body has reached maximum capacity and no further waste can be received.

5 In one embodiment, the container 10 can be part of a kit comprising one or more syringes and needle assemblies. A medical practitioner is thereby provided with an appropriate hand-operated sharps container for the syringes and needles that are being used.

10 **Brief Description of the Drawings**

By way of example, embodiments are now disclosed with reference to the accompanying drawings, in which:

15 Figs. 1 and 6 are perspective views of one embodiment of the container in use;

Fig. 2 is an overhead view of the container of Fig. 1;

20 Fig. 3 is a partial cut-away plan view of the container of Fig. 1 with the receiver portion removed but the door members depicted in location;

Fig. 4 is an exploded view of the interlock mechanism between the door members and cutting block in a non-cutting position;

25 Fig. 5 is an exploded view of the interlock mechanism between the door members and cutting block in a cutting position;

Fig. 7 is an overhead view of the receptacle of the container;

30 Fig. 8 is a cut-away side view of the receptacle of Fig. 7;

Fig. 9 is a underneath perspective view of the receiver portion of the container;

Fig. 10 is a partial cut-away view of another embodiment of a container;

35 Figs. 11 and 12 are perspective views of another embodiment of a container;

Fig. 13a is a plan view of the underneath of the lid and the Fig. 13b is a plan view of the main body of the receptacle;

Fig. 14 is an underneath perspective view of another embodiment of the container; and

Fig. 15 is a perspective view of the receiver portion of the embodiment of Fig. 11.

10 Description of Exemplary Embodiments of the Disclosure

The container is typically a sharps disposal container to receive contaminated medical or surgical sharp objects.

15 In the drawings, several embodiments of a container are depicted in which the container is generally represented as 10 and wherein an example of a part of an object to be disposed of is a needle assembly comprising the needle shaft 101 and a hub 102 of a syringe 100. In one embodiment, the container 10 serves to cut through the hub 102 of the syringe 100. In another embodiment, the container 10 serves to cut through
20 the syringe at the location of the Luer.

The container 10 generally comprises a receiver portion 11 and a receptacle 120. The receiver portion 11 comprises a bottom wall 21 extending between two end walls 22a and 22b. The bottom wall 21 has an inner surface 26. A sidewall 23 is also joined
25 to the bottom wall 21 and extends between the two end walls 22a and 22b to form an outer face of the receiver portion. A top wall 24 also extends between the end walls 22a and 22b and is joined to the sidewall 23. The top wall 24 has an inner surface 27. From Fig. 1, it will be noted that the opposite side of the receiver portion 11 relative to sidewall 23 is open. This allows the receiver portion 11 to relatively receive at least
30 part of the receptacle 120 (see Fig. 1).

The disposable object of the present disclosure may comprise a needle assembly as depicted but it is envisaged that it could equally receive and dispose of other types of clinical debris.

Receiver portion 11 and receptacle 120 are connectable to each other and moveable relative to one another. In this regard, these two components may be biased in a first non-cutting position relative to one another as generally depicted in Fig. 1. Receiver portion 11 and receptacle 120 are moveable relative to one another upon
5 actuation of the container 10 by a user to a configuration which is generally depicted in Fig. 12.

In the embodiment of the container shown in Fig. 1, the two components (receiver portion 11 and receptacle 120) are hingedly connected in a first non-cutting
10 position. In this position, a majority of the receptacle 120 is spring biased substantially away from sidewall 23 of receiver portion 11.

Receptacle 120 may move relative to a substantially fixed receiver portion 11. Alternatively, receptacle 120 may be substantially fixed with receiver portion 11
15 moveable relative said receptacle 120 upon compression by a user. Still further, in one embodiment, both receptacle 120 and receiver portion 11 are moveable relative to one another.

Receptacle 120 as depicted in the drawings is dimensioned to receive a number
20 of disposed contaminants and in one embodiment, a number of sharp objects.

An embodiment of a receptacle is depicted in Fig. 8. Receptacle 120 comprises a main body 121 and a lid 123. To avoid tampering of the receptacle 120, lid 123 is secured in a manner to main body 121 that aims to prevent removal of the lid 123 from
25 the main body 121.

Main body 121 has a bottom surface 124, at least one upwardly extending side wall 125 and an open upper rim 126. The rim 126 can relatively receive the lid 123 to form a closed receptacle 120.
30

As can be seen in Fig. 8, the bottom surface 124 has a circle-shaped indent 127 that protrudes upwardly into the main body 121. It will be appreciated that the indent 127 could come in other shapes. The indent 127 can relatively receive a complementary protrusion or spring 25 positioned on the inner surface 26 of the bottom
35 wall of the receiver portion 11. This complementary engagement of the two

components (receiver portion 11 and receptacle 120) provides a first hinged engagement between the two components.

5 A second hinged engagement can be provided. In the depicted embodiment, it is provided between lid 123 of the receptacle 120 and the internal surface 27 of top wall 24 of receiver portion 11. As depicted in Fig. 9, this second hinged engagement can be provided by a protrusion 28 on the inner surface 27 of top wall 24 which can be relatively received within an indent 128 formed in the lid 123 of the receptacle 120.

10 The first and second hinged engagements provide pivot points at a hinged end for the container 10 around which receptacle 120 and receiver portion 11 are moveable relative to one another.

15 Receptacle 120 further includes at least one spring member 129 extending therefrom. As depicted, said at least one spring member 129 extends from sidewall 125 from a first end 130 connected to said sidewall 125 to a free end 131. Angle A is formed between spring member 129 and sidewall 125. A portion of spring member 129 at and adjacent to free end 131 is relatively engageable with the receiver portion 11, for example, the inner surface of sidewall 23. Spring member 129 is substantially
20 flexible such that compression of receptacle 120 relatively toward receiver portion 11 causes angle A to decrease.

In the configuration shown in for example Fig. 1, said at least one spring member 129 biases the receptacle 120 in a non-cutting configuration relative to the
25 receiver portion 11. In this biased configuration, a portion of the receptacle 120 adjacent to hinged end 132 is partially housed within a complementary hinged end 29 of receiver portion 11.

30 Receptacle 120, including both the main body 121 and the engaged lid 123 extends from the partially housed hinged end 132 to a non-hinged end 133 which is substantially spaced from sidewall 23 of receiver portion 11. A majority of the non-hinged end 133 is not housed in receiver portion 11 when the container 10 is in the non-cutting configuration (as depicted in Fig. 1).

Compression of the two components (receptacle 120 and receiver portion 11) relatively towards one another causes receptacle 120 to pivot around its hinged end 132 such that the non-hinged end 133 moves towards sidewall 23 of receiver portion 11.

5 The container 10 includes a door structure 200. The door structure 200 is movable between a substantially closed configuration and an open configuration. The door structure 200 can comprise a plurality of door members. As depicted in Figs. 3-5, the door structure can in one embodiment have two opposing door members 201a, 201b. Each door member 201a, 201b is relatively moveable from a closed
10 configuration as depicted in Fig. 3 to an open configuration as depicted in Fig. 5. The door members 201a, 201b may be made from a resiliently flexible material and spring mounted on internal surface 27 of top wall 24 of receiver portion 11.

 The door structure 200 is typically connected to internal surface 27 although it is
15 envisaged that it may be connected to another part of the container 10. For example, the door structure could be connected to end walls 22a and 22b of receiver portion 11. In one embodiment, the door members 201a, 201b are biased in a closed configuration relative to one another. In this manner, the doors provide a barrier to spillage of the contaminated contents from within the container 10.

20

 In the depicted embodiment, each door member 201a, 201b comprises a main body 202. The main body 202 of door member 201a has a concave abutment edge 203a. The main body 202 of door member 201b has a convex abutment edge 203b. The concavity and convexity of respective edges 203a, 203b is complementary such
25 that when the door structure 200 is in a closed configuration, the two abutment edges 203a, 203b form a substantially tight seal at an abutment interface 208 with at least a majority of each edge in engagement with the other.

 Both of the door members 201a, 201b have an edge 204 at an end distal the
30 abutment interface 208. Each of the edges 204 are connected to a spring structure 205. Each spring structure 205 extends from the respective edges 204 to a fixation member 206 that is mounted to a post 212 extending downwardly from the inner surface 27 of the top wall 24. As shown, in one embodiment, each spring structure 205 can comprise two relatively flexible, curved and elongate arms 207. These arms are configured to at
35 least partially bow outwardly relative to each other as the door members 201a, 201b move relatively apart from each other. The arms 207 allow the respective main body

portions 202 to move relatively closer to the respective fixation members 206 of each of the door members 201a, 201b, thereby providing an opening between the respective edges 203a, 203b.

5 The abutment interface 208 formed when the door members 201a, 201b are in their closed configuration typically substantially aligns inferiorly with aperture 30 that extends through the top wall 24 of the receiver portion 11.

10 As noted above, when the door members 201a, 201b are substantially closed, the container 10 is in a non-cutting configuration to prevent spillage of needles or other sharps from the container 10. Opening of the door members 201a, 201b relative to each other is initially achieved in one embodiment by the force of an object against the abutment interface 208. As shown, such an object may comprise a syringe 100. As the tip 103 of needle shaft 101 is pressed against the abutment interface 208, the door
15 members 201a, 201b can be prised apart relative to one another. The resultant gap caused by this prising apart enables the needle shaft 101 to pass therethrough. The hub 102 of syringe 100 has a greater diameter than the needle shaft. The hub is then movable into the gap and against an upper surface 209 of each door member 201a, 201b. The hub 102 serves to push the door members 201a, 201b further apart and out
20 of their normally biased closed position. The force of the needle and the hub against the abutment edges 203a, 203b of each door member together with the feature that each arm 207 is fixed at fixation member 206 to internal surface 27, causes a greater bowing out or flexing out of arms 207 as they are compressed between the main bodies 202 and the fixation members 206.

25 As shown in Fig. 5, each upper surface 209 can have a hub receiving recess 210 adjacent to the respective abutment edges 203a, 203b. The hub receiving recesses 210 of each door member 201a, 201b allow both a longitudinal and a radial force against door members 201a, 201b as required to open each door member relative to one
30 another.

 The door members 201a, 201b are substantially recessed within the container 10 as seen in the accompanying figures. This makes it relatively difficult, if not impossible, for a user to physically touch the door members 201a, 201b in normal use.
35 It can have the further benefit that the door structure 200 is at least partially shielded from damage resulting from relatively high drop impact forces.

In the embodiment wherein the disposable object is a syringe or like, it is preferred that the hub 102 of the syringe is cut rather than the metal shaft 101 of the needle. To ensure that hub 102 rather than the needle shaft 101 is cut, the door structure 200 is configured such that the door members are opened to a fully open position upon positioning of the hub member between the two abutment edges of the door members. Only in said fully open position is a cutting pathway for cutting mechanism 300 defined therebetween.

Cutting mechanism 300 comprises a cutting member 301. The cutting mechanism 300 is positioned in, on or adjacent to top wall 24. The cutting member 301 is typically a blade 303 having a fixed end 304 and extending to a free cutting edge 305. The blade 303 is mounted on safety connection 400. Safety connection 400 typically comprises a platform 401 and one or more depending legs 402 which have an attachment flange 403 to secure the safety connection 400 to receptacle 120. As shown in Fig. 8, depending leg 402 is received in a catch 134 of receptacle 120. The attachment flange 403 is tapered and once forced beyond catch 134, the legs 402 are not readily removable from receptacle 120.

The cutting mechanism 300 is positioned on an upper surface of platform 401 of safety connection member 400.

Platform 401 is removably attached to lid 123 by one or more tear off tabs 404. The cutting member 301 is partially sandwiched between platform 401 and a recess 140 formed in the inner surface of the lid 123 and shaped to match that of the cutting member 301. This sandwiching of the cutting member serves to hold it in place during normal use. Other fixation mechanisms may be employed, for example, adhesive may be used to attach the cutting member 301 to platform 401.

Tampering of the container 10 such as an attempt to remove the lid 123 from the main body 121, breaks tear off tabs 404 and breaks the connection between the platform 401 of safety connection 400 and the lid 123. With platform 401 released from lid 123, the cutting member 301 is also released and typically falls into main body 121.

While the above mechanism renders the device inactive due to tampering (typically tampering to allow a user to re-use the device following the emptying of its contents), a user may also deliberately de-activate the container 10 to prevent its re-use. In this regard, the lid 123 comprises an aperture 135 at a location superior to at least
5 part of the cutting member 301 and the platform 401. Insertion of an object through aperture 135 and application of force down upon the cutting mechanism and the platform breaks the connection formed by the break off tabs 404 between the platform and the lid and the cutting member is released into main body 121. Release of the cutting mechanism in this manner may also have the advantage of allowing its
10 subsequent controlled removal to facilitate the re-cycling of the plastic material of the remainder of the container 10.

To receive the object to be disposed, the lid 123 of receptacle 120 defines a cut-out aperture 136 therein. As shown in Fig. 7, the cutting member 301 at least partially
15 extends from platform 401 into this aperture 136 such that the cutting edge 305 is positioned in said cut-out aperture 136. At a location adjacent the side wall 125, the lid 123 also defines a partially circular portion 137 of the cut-out aperture 136.

Partially circular portion 137 of the cut-out aperture 136 substantially aligns
20 inferiorly with aperture 30 of receiver portion 11 when the container 10 is in a non-cutting configuration. Partially circular portion 137 receives needle shaft 101 and hub 102 once inserted through aperture 30.

In one embodiment, the partially circular portion 137 is dimensioned to receive
25 the hub 102 of a syringe 100 up to a certain diameter. If a user attempts to insert a needle assembly further into the container, such size restriction of the cut out portion 137 together with the size of aperture 30 and the opening space created by the door structure 200 will prevent such further and potentially damaging over-insertion. However, and as depicted in Fig. 10, the aperture 30 can be enlarged to receive not only
30 the needle hub 102 but also the tip of the syringe Luer 306. In this case, the container when used cuts both the Luer tip 306 and the needle hub which has the result of disabling both the syringe and the needle.

The partially circular portion 137 is spaced from the cutting edge 305 of cutting
35 member 301. In this embodiment, once a hub 102 is positioned within the partially circular portion 137, it is substantially fixed in place by the aperture 30, and therefore

as the receptacle 120 is pushed relatively towards the receiver portion 11 the fixed hub 102 is engaged by the cutting member 301 and cut from the remainder of the needle assembly.

5 In the depicted embodiment, the cutting member 301 is prevented from cutting the needle or hub until the door members 201a, 201b are in their fully open position. Once fully open, the abutment edges 203a, 203b of door members 201a, 201b define a curved cutting pathway which can be seen in Fig. 5.

10 A cutting block 302 is provided on and extends upwardly from the upper surface of the lid 123. It is located adjacent the cut-out aperture 136. If the door members 201a, 201b are not fully opened to define the curved cutting pathway, cutting block 302 abuts with at least one sidewall 211 of one or both door members 201a, 201b, thereby providing an interlock and preventing the cutting member 301 moving relatively
15 forward as the container 10 is compressed. In this instance, where the door members 201a, 201b are not fully open, a user will feel resistance from the interlock as they attempt to compress the receptacle 120 and receiver portion 11 relatively towards one another. It is necessary to disable this interlock to facilitate the cutting of the object and this may only be achievable in the depicted embodiments when the hub 102 of the
20 needle fully opens the door members 201a, 201b and is positioned in the partially circular cut out portion 137 of lid 123. This safety system prevents cutting the needle shaft (which would damage the cutting member) rather than the hub 102.

Other interlock mechanisms can be envisaged. For example, the door members
25 may comprise one or more depending pins which are receivable within slots in the cutting blade when the door members have been fully opened. When the door members are closed or only partially opened, the blade abuts the pins thereby preventing cutting.

30 Top wall 24 of receiver portion 11 further includes a rail 31 at least partially surrounding aperture 30. Rail 31 comprises a raised rim of the material of receiver portion 11. Rail 31 may be positioned solely on said receiver portion 11. Alternatively and as depicted in Figs. 11-12, a first part 32 of rail 31 may be positioned on top wall 24 of receiver portion 11 and a second part 33 may be positioned on lid 123 of
35 receptacle 120.

The rail 31 acts as a guard for the tip of the needle to prevent slipping across the surface of the container 10 resulting in accidental injury to a user.

As depicted in Fig. 13b, the container 10 may further comprise one or more
5 internal ribs 138 which extend from an internal surface of sidewall 125 and form a slope onto which discarded needle parts or other sharps may fall. Such ribs 138 function to enhance stackability of discarded needle parts in the main body 121. In this regard, ribs 138 orientate the discarded needle shaft off centre. Keeping the centre of main body 121 substantially free from discarded needles and hubs provides an insertion
10 zone for newly inserted needles and hubs. A user will preferably not feel any resistance against discarded material in the main body 121 at least until the needle is fully inserted into a cutting position and/or until the main body 121 has reached maximum capacity and no further waste can be received.

15 The container 10 may further include one or more tear zones which are areas of weakness in the thickness of a wall of the receptacle 120 and/or receiver portion 11. Typically, these tear zones comprise a channel 41 (see Fig. 14) in the wall of the receptacle 120 and/or receiver portion 11. Such channels can be formed at or adjacent the hinged end 29 of the receiver portion 11 and should a user attempt to forcefully
20 open the container or unhinge the components, the container will crack and/or break at said tear zones, with the aim of preventing use thereafter.

The shape of the container 10 is designed to enhance a user's grip and provide an easy to use device. The container 10 may be provided with finger grip recesses 139
25 to prevent slipping during use.

In use, the container 10 can be placed on a flat surface. A user inserts a needle vertically into the container 10 via aperture 30 with the master hand. The mechanisms of the container 10 described above ensure that the doors members 201a, 201b are only
30 opened fully when the hub 102 rather than the needle shaft 101 is correctly positioned for cutting within the container 10. Once fully opened by the hub, the door structure 200 and the cutting block 302 are released from their interlock configuration relative to one another to define a cutting pathway for travel by the cutting member 301. At this stage, compression of the container 10 by the user with their other hand successfully
35 cuts the hub 102 of the syringe. The compression with the other hand may then be

released and the syringe withdrawn back via aperture 30. In this configuration, the door members 201a, 201b bias shut again and prevent spillage of the contents.

5 The container can be fabricated from one or more appropriate materials. In one embodiment, the receptacle and receiver portion can be fabricated from a polypropylene. The door members can be fabricated from a suitable material. The blade can be fabricated from a suitable metal, for example, stainless steel.

10 When the container 10 is full, it may simply be appropriately disposed. Alternatively, if it is desired to recycle the materials, the container may be sent for autoclaving. Once sterilised, the two components (receiver portion 11 and receptacle 120) may be prised apart at their respective hinged ends, possibly with a screwdriver or like tool. To empty the waste contents from the receptacle 120, it is necessary to separate the main body 121 and lid 123. This can be achieved by a user simply pulling
15 the lid 123 from the main body 121. Alternatively, the cutting mechanism can first be de-activated by using a tool to strike the cutting blade 303 at or adjacent its exposed cutting edge 305 or through aperture 135, thereby causing the blade 303 to be disabled completely. Once separated, the sharps and the metal blade can be collected and buried according to regulations governing such materials. The container 10 can then be
20 shredded and recycled.

In one embodiment, the container 10 can be part of a kit comprising one or more syringes and needle assemblies. A medical practitioner is thereby provided with an appropriate hand-operated sharps container for the syringes and needles that are being
25 used.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the above-described embodiments, without departing from the broad general scope of the present disclosure. The present
30 embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

CLAIMS:

1. A container including:
 - a receiver portion having an aperture to receive at least part of a disposable object;
 - a door structure moveable between a substantially closed configuration and an open configuration;
 - said door structure moveable to said open configuration by relative insertion of said object into said aperture;
 - a cutting member to cut off at least a portion of said object from the remainder of said object;
 - wherein when the doors are in said closed configuration the cutting member is prevented from engaging with said object and when said doors are in said open configuration the cutting member is engageable with said object; and
 - a receptacle to receive and house said cut off portion of said object.
2. The container of claim 1 wherein said disposable object comprises a needle assembly including a needle shaft and a hub of a needle.
3. The container of claim 1 or claim 2 wherein the receiver portion and receptacle are relatively connectable to each other.
4. The container of claim 3 wherein the receiver portion and receptacle are hingedly connectable to each other.
5. The container of any one of the preceding claims wherein the receptacle comprises a main body and a lid.
6. The container of claim 5 wherein the receptacle further includes at least one spring member extending therefrom.
7. The container of claim 6 wherein the spring member biases the container in a first non-cutting position.

8. The container of any one of the preceding claims wherein said door structure comprises a plurality of door members wherein each door member is relatively moveable from a closed configuration to an open configuration.
- 5 9. The container of claim 8 wherein the door members are spring mounted on an internal surface of the receiver portion.
10. The container of claim 8 comprising opposing door members each comprising a main body and wherein the main body of one door member has a concave abutment edge and the main body of the other door member has a convex abutment edge, said
10 respective abutment edges forming a substantially tight seal at an abutment interface.
11. The container of claim 10 wherein said door members have a distal edge at an end of the main body which is distal the abutment interface and wherein each distal
15 edge is connected to a spring structure.
12. The container of claim 11 wherein the spring structures comprise two relatively flexible, curved and elongate arms, said arms configured to at least partially bow outwardly relative to each other as the door members move relatively apart from each
20 other.
13. The container of any one of the preceding claims wherein the door members are substantially recessed within the container.
- 25 14. The container of any one of claims 6 to 13 wherein the cutting member is positioned in, on or adjacent to the lid of the receptacle.
15. The container of claim 14 wherein the cutting member comprises a blade having a fixed end and extending to a free cutting edge.
30
16. The container of claim 15 wherein the blade is mounted on a platform of a safety connection
17. The container of claim 16 wherein the safety mechanism further comprises one
35 or more depending legs having an attachment flange to secure the safety connection to

the receptacle and wherein said attachment flange is secured in a catch member extending from a sidewall of the receptacle.

18. The container of claim 17 wherein the platform and the lid substantially hold the blade therebetween and wherein said platform is removably attached to the lid by one or more tear off tabs such that removal of the lid from the receptacle breaks the tear off tabs and releases the blade from between the platform and the lid.

19. The container of claim 16 further comprising an aperture defined in the lid at a location of the lid which is superior to at least part of the cutting member and the platform.

20. The container of claim 19 wherein said aperture is of a size to receive a tool to break the tear off tabs to release the cutting member from the platform and into the main body.

21. The container of any one of claims 5 to 20 wherein said lid of the receptacle defines a cut-out aperture to receive a needle and a needle hub therein.

22. The container of any one of claims 5 to 21 further comprising a cutting block said cutting block preventing the cutting of the object until the door members are in their fully open position.

23. The container of claim 22 wherein said cutting block is provided on and extends upwardly from an upper surface of the lid and adjacent said cut-out aperture of the lid.

24. The container of claim 23 wherein when the door members are in said closed configuration, the cutting block abuts with at least one sidewall of one or both door members and prevents cutting.

25. The container of any one of the preceding claims wherein the receptacle further comprises one or more internal ribs which extend from an internal surface of a sidewall and form a slope onto which discarded needle parts or other sharps may fall.

26. A container including:

a receiver portion having an aperture to receive at least part of an object to be disposed;

a door structure moveable between a substantially closed configuration and an open configuration to receive at least part of said object;

5 a cutting member to cut off least a portion of said object from the remainder of said object;

a receptacle to receive and house said cut off portion of said object, said receptacle having a base and a lid, said cutting member connected to said receptacle;

10 wherein at least partial removal of the lid member from the base releases said cutting member from its connection with said receptacle.

27. The container of claim 26 wherein said object comprises a needle assembly including a needle shaft and a hub of a needle.

15 28. The container of claim 26 or claim 27 wherein the receiver portion and receptacle are relatively connectable to each other.

29. The container of claim 28 wherein the receiver portion and receptacle are hingedly connectable to each other.

20

30. The container of any one of claims 26 to 29 wherein the receptacle further includes at least one spring member extending therefrom.

25 31. The container of claim 30 wherein the spring member biases the container in a first non-cutting position.

32. The container of claim 31 wherein the door structure comprises a plurality of door members wherein each door member is relatively moveable from a closed configuration to an open configuration.

30

33. The container of claim 32 wherein the door members are spring mounted on an internal surface of the receiver portion.

34. The container of claim 33 wherein the door members are substantially recessed
35 within the container.

35. The container of any one of claims 26 to 34 wherein the cutting member is positioned in, on or adjacent to the lid of the receptacle.

36. The container of claim 35 wherein the cutting member comprises a blade having
5 a fixed end and extending to a free cutting edge.

37. The container of claim 36 wherein the blade is mounted on a platform of a safety connection, said safety connection comprising one or more depending legs having an attachment flange to secure said safety connection to the receptacle and wherein said
10 attachment flange is received in a catch member extending from a sidewall of the receptacle.

38. The container of claim 37 wherein the platform and the lid substantially fix the blade therebetween and wherein said platform is removably attached to the lid by one
15 or more tear off tabs such that removal of the lid from the receptacle breaks the tear off tabs and releases the blade from between the platform and the lid.

39. A kit comprising:
a plurality of needle members; and
20 a container comprising;
a receiver portion having an aperture to receive at least part of at least one of the needle members;
a door structure moveable between a substantially closed configuration and an open configuration;
25 said door structure moveable to said open configuration by relative insertion of said at least one needle member into said aperture;
a cutting member to cut off at least a portion of said at least one needle member from the remainder of said object;
wherein when the doors are in said closed configuration the cutting member is
30 prevented from engaging with said at least one needle member and when said doors are in said open configuration the cutting member is engageable with said at least one needle member; and
a receptacle to receive and house said cut off portion of said needle member.

35

40. A kit including:

a plurality of needle members; and

a container comprising;

a receiver portion having an aperture to receive at least part of at least one of said needle members;

5 a door structure moveable between a substantially closed configuration and an open configuration to receive at least part of at least one of said needle members;

a cutting member to cut off at least a portion of said at least one needle member from the remainder of said object;

10 a receptacle to receive and house said cut off portion of said at least one needle member, said receptacle having a base and a lid, said cutting member connected to said receptacle;

wherein at least partial removal of the lid member from the base releases said cutting member from its engagement with said receptacle.

15

20