Abstract Title: Dispensing of gloves from a stack

A dispenser 1 for disposable gloves comprises a container 2 and a stack of disposable gloves 22 oriented for dispensing through an aperture 6 cuff-first, the fingers 34 of each glove being folded back against the cuff 36 of that glove to protect the fingers from user contact. The cuffs of the gloves are aligned on one side 42 of the stack, with the cuff openings 40 facing outwardly through the dispensing aperture. A movable plate member 26 may rest on the top of the stack. The dispensing aperture may be opened in stages by removing successive panels 14, 15, 16 of a side wall of the container. The uppermost panel 14 may include a semi-circular area 11 of the top wall of the container. The dispenser may be removably held in a wall-mountable holder.
Dispensing of Gloves

BACKGROUND

a. Field of the Invention

The present invention relates to the dispensing of gloves from a dispenser.

b. Related Art

The control of infection of patients in hospitals, clinics, and doctors' surgeries has become an ever more pressing concern with the rise of infectious bacteria resistant to multiple antibiotics, in particular methicillin-resistant staphylococcus aureus (MSRA). In the United Kingdom alone there are thought to be about 5,000 deaths a year from infections caught in hospitals but some experts believe the number could be as high as 20,000.

Research has shown that high levels of MRSA are present on everyday items in hospitals. Samples taken from an intensive care unit at a London hospital found MRSA on charts, bins, pens, medical notes, phones and computer keyboards. There was also MRSA present on staff aprons and hands. The most common route for MRSA infection is between patients or via a doctor or nurse. Hospital staff can spread MRSA by using such items after having contact with patients.

Research has also shown that if someone has MRSA on their hands, the bacteria would be left on the next four surfaces touched by that person. Once MRSA is on an item it will remain there for up to 80 days unless that item is cleaned.

Disposable medical gloves can help prevent cross-contamination, but a problem arises if external parts of the glove are touched by a person prior to or during donning of the glove. Such external parts can then become contaminated prior to use US 4,844,293 discloses a glove dispensing system where a package of gloves
is placed in an outer container, and gloves are dispensed through registering apertures in the package and the outer container. The cuffs of the gloves are not directly accessible to the user.

This arrangement encourages users to touch a glove only by the cuff and so minimise the risk of contamination, but at the cost of increased mechanical complexity and the need to apply an adhesive to the otherwise pristine external surface of the glove.

Most gloves used in hospitals and clinics are examination gloves, and these are used in large numbers such gloves are supplied not in individual sterile packages, but in relatively inexpensive cardboard dispensing boxes. One way of controlling contamination on such examination gloves is disclosed in patent document US 5,816,440. In this disclosure, gloves are packaged with over-folded cuffs within a box having a dispensing aperture. The fingers of each glove are looped partially or interfolded around the cuff of the subsequent glove so that as each glove is pulled from the aperture, the cuff of the next glove is pulled out of the aperture to make it easy for a user to get hold of the over-folded cuff of the next glove.

Apart from the several additional manufacturing steps entailed by this arrangement, the combination of cuff over-folding and interfolding of neighbouring gloves creates voids within the stack of interfolded gloves and so reduces the number of gloves which can be packed in a given volume. Furthermore, the cuff of the next glove may not always be reliably pulled from the aperture.

Another glove dispensing system is disclosed in US 5,921,434, in which gloves are packed flat in the same orientation one on top of another within a box having a dispensing aperture. The cuffs of the gloves are held in place by an elastic band, which passes through a hollow roller that presses on the inside surface of a part of the cuff of the next glove to be dispensed. Neighbouring gloves are partially adhered to each other so that as each glove is pulled from the box the cuff of the next glove is pulled partially out of the box by the action of the roller and adhesive
between the gloves.

This arrangement encourages users to touch a glove only by the cuff and so minimise the risk of contamination, but at the cost of increased mechanical complexity and the need to apply an adhesive to the otherwise pristine external surface of the glove.

It is an object of the present invention to provide a more convenient and reliable arrangement for dispensing gloves in a medical or clinical environment or in any other environment where the control of hand borne contamination is important.

SUMMARY OF THE INVENTION

According to a first embodiment of the invention, there is provided a dispenser for disposable gloves, comprising a container and a plurality of disposable gloves, wherein:
- the container has a plurality of faces;
- each glove has a cuff portion and a finger portion, the cuff portion having a cuff and the gloves being stacked one on another with the cuffs of the gloves being aligned on one side of the stack of gloves;
- the stack of gloves is held within the container;
- the container has in use a dispensing aperture in at least one face of the container through which gloves can be dispensed;
- the gloves are oriented in said container so that said gloves are positioned for dispensing cuff-first through said aperture; and
- the finger portion of each glove is folded back against the cuff portion of the same glove to protect the finger portion from user contact and contamination during dispensing of the glove.

The term “finger portion” here means the portion of the gloves for covering the four fingers of a user’s hand, and optionally also the portion of the glove for covering the user’s thumb.
The folded arrangement of the gloves according to the invention provides a number of benefits. First the finger portion of the glove when stacked flat will tend to have a degree of wasted space between the fingers, as compared with the cuff portion which, of course, is of one piece and so presents no such wasted space. The result is that the packed volume of a particular number of stacked gloves, when folded with the finger portion bearing against the cuff portion, is less than the packed volume of the same number of gloves when stacked in a non-folded arrangement. Here, the packed volume is the volume of an equivalent multi-sided dispensing container, which will most practically be a six sided box.

In a preferred embodiment of the invention, the container is a six-sided, approximately cubic box, and the aperture extends around a right angled edge of the box across two adjacent sides, one of which is substantially bisected by the aperture, and the other of which the aperture extends only proximate said edge.

Furthermore, because gloves are invariably longer from cuff to fingertip than they are broad, the folded arrangement according to the invention can be formed into a stack with approximately cubic proportions. This tends to minimise the volume of the stacked arrangement as compared with the surface area of the container, thus reducing the relative amount and cost of packaging necessary to form the container used for the glove dispenser. An approximately cubic packing arrangement also provides greater flexibility in terms of where the dispenser can be mounted, placed or used, owing to the reduced maximum dimensions of the container.

In a preferred embodiment of the invention, the gloves are stacked one on another between opposite ends of the stack, and the glove dispenser is arranged in use to dispense gloves preferentially from a first one of these ends. The finger portion of each glove is then folded back against a side of the cuff portion furthest away from said first end of the stack of gloves. Thus, the finger portions are covered over prior to being dispensed, so that any contamination from the user upon touching
the glove will be limited to the cuff portion or region of the glove.

Preferably, in order to facilitate access to the next glove to be dispensed, the dispensing aperture includes a portion of the aperture that extends across a portion of a face of the container opposite the top side of the stack.

When vertically oriented in use, the stack will have a top side and a bottom side. The aperture may therefore be shaped to facilitate preferentially the removal of gloves cuff first from the top side of the stack, the finger portion of each glove therefore being folded underneath the cuff portion of the same glove.

In a preferred embodiment of the invention, the dispenser comprises additionally a movable plate within the container, the plate being positioned on the top side of the stack of gloves to protect the topmost glove in the stack. The movable plate preferably moves downwards under its own weight as each glove is dispensed from the top of the stack of gloves. Therefore, there are preferably no means biasing the movable plate towards the stack of gloves, which simplifies the manufacture and operation of the dispenser as compared with a dispenser having such means.

The dispensing aperture may include a portion of the aperture that extends across a portion of a face of the container opposite the top side of the stack. The movable plate may then be shaped to conform to the shape or extent of this portion of the dispensing aperture. This helps to maximise the accessibility of the next glove to be dispensed while at the same time providing protection over the stack of gloves outside the bounds of the dispensing aperture.

Also according to a second embodiment of the invention, there is provided a dispenser for disposable gloves, comprising a container and a plurality of disposable gloves, wherein:
- the container has a plurality of faces;
- the gloves being stacked one on another with the cuffs of the gloves being
aligned on one side of the stack of gloves;
- the stack of gloves is held within the container;
- the container has in use a dispensing aperture in at least one face of the container through which gloves can be dispensed;
- the gloves are oriented in said container so that said gloves are positioned for dispensing cuff-first through said aperture; and
- prior to use the dispensing aperture is covered over by a plurality of panels, said panels being individually removable so that the size of the dispensing aperture may be increased during use to aid access to the next lowest section of gloves to be dispensed - depending on the number of gloves left in the stack for dispensing. This plurality of removable panels enables the cuffs of the majority of gloves still within the stack to remain protected from the environment.

The invention further provides a system for dispensing disposable gloves, comprising a wall-mountable holder and a dispenser for disposable gloves, the dispenser being as described above according to either the first or the second embodiments of the invention, wherein the dispenser may be securely and removeably held in the holder so that gloves can be dispensed from the dispenser when held in the holder.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be further described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a dispenser for disposable gloves, according to a first preferred embodiment of the invention, in the form of an approximately cubic rectangular container having a tear-off portion which can be removed to form a dispensing aperture in the container;

Figure 2 is a perspective view of the dispenser of Figure 1, showing the tear-off portion removed to reveal inside a stack of disposable gloves ready
for dispensing cuff first from the dispensing aperture, the stack of gloves being protected by a movable plate that sits within the container on top of the stack of gloves;

Figure 3 is a plan view of a protective cover plate;

Figure 4 is a vertical cross-section through the unopened dispenser, taken along line IV-IV of Figure 1;

Figure 5 is a vertical cross-section through the opened dispenser, taken along line V-V of Figure 2;

Figure 6 is a view of a glove with the finger portion of each glove underfolded against the cuff portion of the same glove;

Figure 7 is a view of a variant of the under-folded arrangement of Figure 6, for use in a second embodiment of the invention, in which the endmost portion of the cuff is folded back over the outside of the cuff of the glove; and

Figure 8 is a view of a further variant of the under-folded arrangement of Figure 6, for use in a third embodiment of the invention, in which the underfolder fingers are tucked inside an under-folded endmost portion of the cuff.

DETAILED DESCRIPTION

Figure 1 shows a dispenser 1 for disposable gloves. The dispenser includes a nearly cubic container 2 which has six faces, three of which are visible in the drawing, including a front face 3, a right side face 4 and a top face 5. The container has a removable portion 6 which extends as a vertical strip 7 across the front face from near a bottom edge 8, to a top edge 10 and on to a semicircular area 11 of the top face 5. The removable portion 6 is temporarily held to adjacent
portions of the container at a perforated line 12 in the container material that extends fully around the removable portion. The container is preferably formed of an inexpensive card-like material, for example cardboard.

The removable portion is subdivided horizontally into three sections 14, 15, 16 by means of a pair of parallel cuts 18, 19 that extend horizontally between opposite vertical sections of the perforated line 12 in the container front face 3. The cuts need not be full cuts through the container material, but may be partial cuts or perforations which are weaker than the peripheral perforation 12.

This is done so that the three sections 14, 15, 16 of the removable portion 6 can be removed one at a time. The container is opened first by removing the topmost section 14, which extends across an upper central portion of the front face and includes a central portion of the top edge and all of the semicircular area 11 on the top face 5. As will be explained below, gloves may then be removed through an aperture thus formed, and as the level of gloves inside the container 2 drops, the middle and bottom sections 15, 16 may be removed to enlarge the aperture.

Figure 2 shows, for convenience only, the container 2 with all three of the removable sections 14, 15, 16 having been removed to form a dispensing aperture 24, but with the container still full of a stack 20 of disposable gloves 22 visible through the aperture 24 formed in the front and top faces 3, 5 of the container 2. Although the container 2 can be opened in this way, it is preferred if the sections 14, 15, 16 are removed one at a time as required in order to gain access to the gloves 22, as then the sections 15, 16 not yet removed will afford some protection against contamination of the stack 20 of gloves 22.

Reference is now made also to Figures 3 to 5, which illustrate the internal arrangement of the gloves 22, and also of a protective movable plate 26, within an interior volume 28 of the container 2. The stack 20 of gloves 24 is formed by numerous gloves 22 laid horizontally one on another between a bottom surface 30 of the stack and a top surface 32 of the stack 20. Each glove 22 is folded in the
same way, essentially in half, as shown in Figure 6, with a finger portion 34 of the
glove 22, including four glove fingers 34A, 34B, 34C, 34D and a glove thumb 35
being folded back underneath a cuff portion 36 of the same glove. It is not
essential that all of each finger portion 34 is fully folded back, but the tips 38 of
each glove finger (and preferably also the glove thumb) should be folded back
beneath the cuff portion 36. As shown in Figure 6, at least some of the glove
fingers 34A-D and thumb 35 will be in actual contact with the cuff portion 36. It is
of course not essential that all are in contact with the cuff portion 36 as long as
these are folded back against the cuff portion in such a way as to protect the finger
portion 34 from user contact and contamination during dispensing of the glove.

In order to produce a more evenly stacked arrangement, and minimise high spots
in the stack, it is preferable if the glove thumb 35 is folded inwards between other
adjacent or nearby fingers and a palm section 37 of the glove, with the long axis of
the thumb 35 being angled inwards but directed mainly forwards. Optionally, the
thumb little finger 34D may also be folded inwards between other adjacent or
nearby fingers and the palm section 37 of the glove, with the long axis of the little
finger 34D being angled inwards but directed mainly forwards in a similar fashion
to the thumb.

The glove folding arrangement shown in Figure 6 is such that an endmost portion
39 of the cuff portion 36 is not folded back on itself, so that a cuff opening 40 for
receiving a user’s hand (not shown) coincides with a lip 41 at the very end of the
cuff portion. Each glove 22 is stacked with the cuff openings 40 being aligned on
one side 42 of the stack 20, which is the side opposite the container removable
section 6, so that each glove 22 may be gripped by a user (not shown) and pulled
out of the container 2 cuff-first.

The upper cuff portion of each glove 22 therefore protects the lower finger portion
24 from collecting external contamination, particularly during the process of
removing a glove from the container. To this end, in this embodiment, it is
important that the glove finger tips 38 do not reach as far as the actual cuff
opening 40, so that the glove finger tips are not inadvertently touched by a user pulling a glove 22 out from the container 2. Therefore, the finger portion 34 may preferably rest beneath the section 37 of the glove cuff portion 36 which, in use, covers a user's palm.

The protective movable plate 26 sits loosely on the topmost glove 22', and follows the stack 20 down under its own weight as gloves 22 are removed, usually one at a time, from the container 2. The plate 26 has a semicircular cut-out 44 which matches the shape of the semicircular area 11 of the aperture 24 in the container top face 5. The semicircular cut-out 44 and area 11 are aligned so that a user can reach into the container from above and through these semicircular features to grip the cuff 38 of the topmost glove 22'. The movable plate 26 therefore prevents a user from touching parts of the glove topmost 22' not revealed by the cut-out 44 and therefore helps prevent contamination from reaching other parts of the glove.

The folded aspect of the gloves 22 also helps the gloves to be pulled from the stack 20 one at a time without dislodging adjacent gloves, particularly the glove beneath the glove being pulled out from the container 2. This is because each part of the glove finger portion 34 of the glove being pulled out tends to remain in place until it is rotated upwards and out towards the dispensing aperture 24. This substantially eliminates rubbing against the glove below the one being dispensed, and so helps to preserve the position of the glove below. Although the top plate 26 may experience some rubbing and consequent friction, the plate is retained within the volume 28 of the container 2 by means of contact between portions 50 of the plate adjacent the semicircular cut-out 44 and an opposing inside surface 52 of the container 2.

Figures 7 and 8 show two variations within the scope of the invention in the way the glove may be under-folded with respect to the glove cuff portion. These variations are for use with a dispenser (not shown) that works in the same way as the dispenser 1 described above. For convenience, features of the gloves 122, 222 illustrated in Figures 7 and 8 corresponding with those features indicated in
Figure 6 are enumerated with reference numerals incremented by, respectively, 100 and 200.

In Figure 7, the cuff lip 141 and endmost portion 139 is folded back against the outside of the cuff portion, in the direction of the cuff portion 137 which in use covers a user's palm. One advantage of this arrangement is that a user can pull the glove 122 out of the dispensing box 2 without having to touch any surfaces of the cuff portion 136 which in use are external on the glove. As with the first embodiment, the tips 138 of the fingers 134A-D do not extend as far as the cuff opening 140. Another advantage is that the folded gloves are more compact in the direction along the length of the gloves from the lip 141 to the finger tips 138. The folded arrangement also tends to lie flatter than that of the first embodiment, mainly because the relatively bulky lip 41 is away from the side of the stack of gloves. These factors mean that the dispensing container 2 can be made more compact in this dimension. A further advantage, shared with the first embodiment, is that the glove fingers 134A-D and thumb 135 will tend to fall away from the gripped cuff endmost portion 139 as the glove 122 is pulled from the dispenser, which reduces the chance of contamination of the glove fingers and thumb from contact with the user.

In Figure 8, at least the tips of the fingers 234A-D are tucked inside the opening 240 to the glove cuff portion 236. Here, the cuff endmost portion 239 is underfolded against the portion 237 of the cuff which in use covers a user's palm. Optionally also the thumb 235 could be tucked inside the opening 240, although in this embodiment, the thumb 235 folded between the under-folded cuff endmost portion 239 and the glove palm portion 237. An advantage of this arrangement is that the folded glove is further shortened in the direction along the length of the gloves from the lip 241 towards the fingers 234A-D. As with the second embodiment, this folded arrangement also ends to lie flatter than that of the first embodiment. The fingers 234A-D are only loosely held within the opening 240, so that the fingers will readily drop out of the opening when the glove 222 is dispensed.
The invention therefore provides a number of benefits and advantages. During use the finger portion of the glove 222, 122, 222 next to be dispensed is covered by the cuff portion of the same glove, which helps keep clean gloves not yet dispensed. The aperture 24 is shaped to facilitate preferentially the removal of gloves cuff first from the top side of the stack 20, the finger portion of each glove being folded underneath the cuff portion of the same glove. This helps to reduce the potential for contamination of the cuffs of gloves not yet dispensed from the container 2.

The various folding arrangements described above result in a rectangular or substantially square outline of the glove stack, as viewed in a horizontal plane. The initial height of the stack is preferably about the same as the short side of the rectangular outline or each side of the square outline. Preferably the container can have an approximately cubic shape or at least a square cross-section in one plane, thus reducing the cost and quantity of packaging needed to form the container.

The dispensing aperture preferably does not extend the complete width of that face of the box. The parts of the dispensing face retained on either side of the aperture act as retainers for the gloves remaining in the stack to prevent them being removed or dislodged as remaining gloves are dispensed. This arrangement also protects a greater portion of the glove from the external environment prior to dispensing.

The overall arrangement therefore also helps to minimise or eliminate touching of the container surfaces surrounding the gloves when a user reaches to pull out one or more gloves from the dispenser. A user can pull out a glove by the cuff without contaminating the main surface portion of the glove, either by touching the glove directly or by dragging the glove across previously contaminated aperture surfaces.
The features described above therefore help to keep the most important external surfaces of the glove used by medical, dental, veterinary or food workers free from pathological micro-organisms.

The invention therefore provides a convenient and reliable arrangement for dispensing gloves in a medical or clinical environment, or in any other environment where the control of hand borne contamination is important.
CLAIMS

1. A dispenser for disposable gloves, comprising a container and a plurality of disposable gloves, wherein:
   - the container has a plurality of faces;
   - each glove has a cuff portion and a finger portion, the cuff portion having a cuff and the gloves being stacked one on another with the cuffs of the gloves being aligned on one side of the stack of gloves;
   - the stack of gloves is held within the container;
   - the container has in use a dispensing aperture in at least one face of the container through which gloves can be dispensed;
   - the gloves are oriented in said container so that said gloves are positioned for dispensing cuff-first through said aperture; and
   - the finger portion of each glove is folded back against the cuff portion of the same glove to protect the finger portion from user contact and contamination during dispensing of the glove.

2. A dispenser for disposable gloves as claimed in Claim 1, in which the cuff portion has a cuff opening for receiving a user's hand, the cuff opening facing outwards with respect to the dispensing aperture.

3. A dispenser for disposable gloves as claimed in Claim 1 or Claim 2, in which the gloves are stacked one on another between opposite ends of the stack, and the glove dispenser is arranged in use to dispense gloves preferentially from a first one of said ends, the finger portion of each glove being folded back against a side of the cuff portion furthest away from said first end of the stack of gloves.

4. A dispenser for disposable gloves as claimed in any preceding claim, in which the finger portion of each glove is folded in the same way as other gloves in the stack.

5. A dispenser for disposable gloves as claimed in any preceding claim, in
which during use the finger portion of the glove next to be dispensed is covered by the cuff portion of the same glove.

6. A dispenser for disposable gloves as claimed in any preceding claim, in which the dispensing aperture includes a portion of the aperture that extends across a portion of a face of the container opposite the top side of the stack.

7. A dispenser for disposable gloves as claimed in any of Claim 1 to 5, in which the stack has in use a top side and a bottom side, the aperture being shaped to facilitate preferentially the removal of gloves cuff first from the top side of the stack, the finger portion of each glove being folded underneath the cuff portion of the same glove.

8. A dispenser for disposable gloves as claimed in any preceding claim, in which the stack has in use a top side and a bottom side, the dispenser comprising additionally a movable plate within the container, the plate being positioned on the top side of the stack of gloves to protect the topmost glove in the stack.

9. A dispenser for disposable gloves as claimed in Claim 8, in which the movable plate moves downwards under its own weight as each glove is dispensed from the top of the stack of gloves.

10. A dispenser for disposable gloves as claimed in Claim 8, in which there are no means biasing the movable plate towards the stack of gloves.

11. A dispenser for disposable gloves as claimed in any of Claims 7 to 10, in which the dispensing aperture includes a portion of the aperture that extends across a portion of a face of the container opposite the top side of the stack.

12. A dispenser for disposable gloves as claimed in any of Claims 8 to 9, in which, the dispensing aperture includes a portion of the aperture that extends across a portion of a face of the container opposite the top side of the stack, and
the movable plate is shaped to conform to said extent of said portion of the dispensing aperture.

13. A dispenser for disposable gloves as claimed in any preceding claim in which the stack of gloves has a substantially square outline.

14. A dispenser for disposable gloves as claimed in any preceding claim, in which prior to use the dispensing aperture is covered over by a plurality of panels, said panels being individually removable so that the size of the dispensing aperture may be increased during use to aid access to the next glove to be dispensed depending on the number of gloves left in the stack for dispensing.

15. A dispenser for disposable gloves, comprising a container and a plurality of disposable gloves, wherein:

- the container has a plurality of faces;
- the gloves being stacked one on another with the cuffs of the gloves being aligned on one side of the stack of gloves;
- the stack of gloves is held within the container;
- the container has in use a dispensing aperture in at least one face of the container through which gloves can be dispensed;
- the gloves are oriented in said container so that said gloves are positioned for dispensing cuff-first through said aperture; and
- prior to use the dispensing aperture is covered over by a plurality of panels, said panels being individually removable so that the size of the dispensing aperture may be increased during use to aid access to the next glove to be dispensed depending on the number of gloves left in the stack for dispensing.

16. A dispensing system for dispensing disposable gloves, comprising a wall-mountable holder and a dispenser for disposable gloves, the dispenser being as claimed in any preceding claim, wherein the dispenser may be securely and removeably held in the holder so that gloves can be dispensed from the dispenser when held in the holder.
17. A dispenser for disposable gloves, substantially as herein described or as shown in the accompanying drawings.

18. A dispensing system for dispensing disposable gloves, comprising a wall-mountable holder and a dispenser for disposable gloves, substantially as herein described.
Application No: GB0801460.7  
Examiner: Stephen Smith  
Claims searched: 1-14, 16  
Date of search: 27 March 2008  

Patents Act 1977: Search Report under Section 17  

Documents considered to be relevant:

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<td>A</td>
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- X Document indicating lack of novelty or inventive step  
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Field of Search:  
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:
- Worldwide search of patent documents classified in the following areas of the IPC  
  - A61B; B65D  

The following online and other databases have been used in the preparation of this search report  
- EPODOC, WPI

International Classification:

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