

Safety Equipment Bag

Technical Field

This invention broadly relates to a safety equipment bag. More particularly, the invention relates to a breachable safety equipment bag.

Background of the Invention

For public transport vehicles that run on airways and seaways, it is required by the law of most countries that items of safety equipment are readily available on board for passengers to use in case of emergency.

Each piece of safety equipment is commonly contained in a bag for storage. Existing bags in the marketplace typically include a mouth kept closed by a strip of Velcro™ having a label seal stuck thereon to indicate that the bags have not been tampered with. The label is however only a tamper-evident but not tamper-resistant feature. As such, the bags are still susceptible to tampering attacks.

Additionally, as a tamper-evident device, the label described above has the following shortcomings:

1. it is prone to peel off over time, particularly in a dry condition such as the cabin of an aircraft; this prompts special inspections to ensure that the bag has not been tampered with, which requires extra manpower and hence incurs extra costs; and
2. it requires manual inspection before each flight departure for security reasons; this is time consuming and hence increases airlines' operational costs;

It is an object of the present invention to provide a safety equipment bag which may overcome or ameliorate the above shortcomings, or which will at least provide a useful alternative.

Disclosure of the Invention

- According to one aspect of the present invention, there is provided a bag for containing safety equipment, the bag including:
- a surface having at least first and second lines of weakness;
 - a slot directly or indirectly associated with the lines of weakness;
 - wherein the first line of weakness and the second line of weakness converge.

Preferably, the bag has a side wall, the slot is generally perpendicular to the side wall, and the first and second lines of weakness are inclined to the side wall.

The bag may be made of any suitable material or combination of materials and may take any suitable shape.

- 5 It will be appreciated that although the bag of the present invention may be transported to and used in any selected location, it is intended to be placed in a public transport vehicle such as an aircraft or a ferry.

Preferably, the bag is a rectangular block and is made of at least two materials, one of which is transparent so that the safety equipment and details provided thereon are
10 visible. More preferably, the bag has at least one transparent surface. Alternatively, the entire bag may be transparent or opaque.

The safety equipment may include a life jacket, a fire blanket or a foldable escape ladder.

The surface may be part of the bag or a panel of the bag. When the bag has a transparent
15 part, this is preferably in the form of a panel forming the surface.

Each line of weakness may be formed in any suitable way, including scoring, perforating, or a combination thereof. Each line of weakness may also take the form of a plurality of holes or depressions. The lines of weakness converge but may do so without actually meeting. The lines of weakness may present in various patterns, some of which
20 are illustrated in the accompanying drawings. Optionally, there may be additional lines of weakness such as vertical and horizontal ones as illustrated in the drawings.

The slot may be in any desired orientation and may be reinforced for example by a plastic structure if desired. The slot may be stitched closed or substantially closed. Preferably, the slot is adapted to allow at least a part of an extension from the safety
25 equipment to be exposed outside of the bag. A portion of the extension of the safety equipment is preferred to be attached to at least part of the slot, for example, by way of stitching.

Conveniently, the slot is located in the centre of the surface. Each line of weakness is preferred to extend from the slot to an edge of the surface. The lines of weakness are
30 preferred to be configured and arranged such that pulling of the extension in the above embodiment causes breaking of the stitching and breach of the surface along each of the lines of weakness, thereby allowing the safety equipment to be drawn out of the bag.

Alternatively, the slot may be defined by an eyelet. The eyelet is preferably made of metal and has a sharp edge.

In an alternate embodiment, the bag has a breaching mechanism including a strap and an hampering means. The strap preferably has one end passing through the eyelet and in use being exposed outside of the bag. More preferably, the strap has an opposite end
5 being attached to the interior of the bag. The strap is preferred to be operatively connected to an elastic band adapted to hold the safety equipment.

The hampering means is preferred to be connected to the strap and located inside of the bag. Preferably, the hampering means is located between the eyelet and the elastic band.

10 In a preferred embodiment, the bag also includes a plurality of holes on another surface, the holes being adapted to facilitate attachment of the bag to a fixture. The fixture may be a seat of an aircraft.

Preferably, the bag includes a slide fastener (also known as zipper) adapted to allow placement or authorised retrieval of the safety equipment from the bag. More
15 preferably, the slide fastener is associated with a tamper-evident device, the details of which are disclosed in international patent application number PCT/AU2007/000929.

Alternatively, the slide fastener is associated with a wirelessly detectable tamper-evident seal, the details of which are disclosed in international patent application number PCT/AU2010/000936. This seal may include a wireless detectable or readable portion,
20 such as an radio frequency (RF) chip or a surface acoustic wave (SAW) chip, which is detectable or readable from up to 1.5 metres away by a remote detector. As such, regular inspections may be carried out remotely, swiftly and efficiently with the remote detector. Also, this is advantageous in that theft may be prevented if a detector is placed near an exit of the public transport vehicle.

25 **Brief Description of the Drawings**

The invention may be better understood from the following non-limiting description of preferred embodiments, in which:

Figure 1 is a perspective view of a bag in accordance with one embodiment of the present invention;

30 Figure 2 is a front view of the bag of Figure 1;

Figure 3 is a front view of a bag in accordance with another embodiment of the present invention;

Figure 4 is a front view of a bag in accordance with a further embodiment of the present invention;

- 5 Figure 5 is a perspective view of a bag in accordance with a yet further embodiment of the present invention;

Figure 6 is a front view of a surface of the bag of Figure 5;

Figure 7 is a side view of a strap in use associated with the bag of Figure 5;

Figure 8 is a front view of another surface of the bag of Figure 5 showing some holes;

- 10 Figure 9 is a perspective view from the rear of the bag of Figure 5;

Figure 10 is a plan view of the bag of Figure 5;

Figure 11 is an end view of the bag of Figure 5;

Figure 12 is a front view of a bag in accordance with a yet further embodiment of the present invention;

- 15 Figure 13 is a front view of a bag in accordance with a yet further embodiment of the present invention;

Figure 14 is a front view of a bag in accordance with a yet further embodiment of the present invention; and

- 20 Figure 15 is an end view of a bag in accordance with a yet further embodiment of the present invention.

Detailed Description of the Drawings

- Referring to Figures 1 and 2, a bag 10 for containing safety equipment (not shown) includes a transparent surface 12, a slot 14 and a side wall 32. The surface 12 has lines of weakness 16, 18, 20 and 22 which are formed by perforations. Line 16 converges
25 with line 18 whereas line 20 converge with line 22.

As best shown in Figure 1, the slot 14 is in contact with the ends of the respective perforated lines 16, 18, 20 and 22. It should however be noted that the slot 14 may be indirectly associated with the slot 14 in a sense that they need not be in contact with any

one of the lines 16, 18, 20 and 22. In this embodiment, the slot 14 is located in the centre of the surface 12. The perforated lines 16, 18, 20 and 22 extend from the slot 14 towards the corners 24, 26, 28 and 30, respectively. Each of the lines 16, 18, 20 and 22 touches and ends at an edge of the surface 12.

- 5 Referring to Figure 1, the bag 10 also includes additional lines of weakness in the form of score lines 44 and 46. Score lines 44 and 46 run parallel to the top and bottom panels 36 and 38 of the bag 10. Score line 44 has an end 48 which meets the ends of the respective converging lines 16 and 18 whereas score line 46 has an end 50 which meets the ends of the respective converging lines 20 and 22.
- 10 As best shown in Figure 2, the bag 10 is a rectangular block and is made of a combination of two materials. The top, bottom and side panels 36, 38, 34 and 40 are made of nylon being stitched to the surface 12 which is made of a transparent material. This is advantageous in that the safety equipment contained in the bag 10 and any information printed thereupon such as a 'use-by' date is visible to a user.
- 15 The bag 10 may however also be made of an opaque material with a tag or label exposed outside of the bag 10 showing the 'use-by' date. In the event that the entire bag 10 is opaque, a window can be stamped out using a jig and covered by a transparent material such that a specific area of the interior of the bag 10 is visible to the user. It is contemplated that the bag 12 may be cylindrical or take any suitable shape.
- 20 Referring to Figure 2, the safety equipment 42 may be a life jacket, a fire blanket or a foldable escape ladder.

Turning to Figure 3, bag 10A is another embodiment of the present invention having additional lines of weakness in the form of vertical score lines 52 and 54.

- Referring to Figure 4, bag 10B is a further embodiment of the present invention having
- 25 two pairs of converging perforated lines 56 & 58 and 60 & 62. In contrast with the embodiments shown in Figures 1 to 3, the converging lines 56, 58, 60 and 62 of bag 10" are not in contact with the slot 14.

- Referring to Figure 1, the slot 14 is reinforced by a plastic structure 64. The safety equipment 42 (see Figure 2) includes an extension in the form of a tab 58 which passes
- 30 through the slot 14 to be exposed outside of the bag 10. The slot 14 is stitched closed by a thread 66 which also engages a portion of the tab 58 of the safety equipment 42 such that the tab 58 is restricted to a desired disposition draping downwards.

Turning to Figures 5 and 6, bag 10C is a yet further embodiment of the present invention. Similar to the above embodiments, the bag 10C has a surface 12D with two pairs of converging perforated lines 80, 82, 84 and 86. The bag 10C also has a slot 14 which is defined by an eyelet 88, as best shown in Figure 6. The eyelet 88 is made out of metal having a shape edge 90.

Referring to Figure 7, the bag 10C has a breaching mechanism including a strap 92 and an hampering means 94. The strap 92 has one end 94 passing through the eyelet 88 and in use being exposed outside of the bag 10C. The end 94 folds back onto itself such that the end surface 96 reduces the likelihood of the end 94 being unintentionally or accidentally pushed into the interior of the bag 10C. The strap 92 has an opposite end 96 which is attached to the internal base of the bag 10C. The strap 92 is arranged such that it forms a loop 98 in the middle which receives the safety equipment (not shown). The strap 92 is also stitched to a folded elastic band 100 which holds the safety equipment in place.

As shown in Figure 7, the hampering means is connected to the strap 92 and located inside of the bag 10C. The hampering means is in the form of a stud 94 having buttonlike upper and lower portions 102 and 104 with the strap 92 sandwiched therebetween. The stud 94 is located between the eyelet 88 and the elastic band 100. The stud 94 is spaced apart from the eye 88 such that when the end 94 of the strap 92 is pulled, the strap 92 travels a short distance so as to allow the stud 94 to gain some momentum before it hits the eyelet 88.

Referring to Figures 8 and 9, the bag 10C also includes a plurality of holes 106 which are provided in pairs in a surface 108 on the opposite side of the bag 10C. The holes 106 facilitate attachment of the bag 10C to a fixture such as the bottom part of a seat in an aircraft via suitable fastening means.

It will be appreciated that in all of the exemplary embodiments shown in the accompanying drawings, the lines of weakness are configured and arranged such that pulling of the tab 68 causes breaking of the stitching 70 and breach of the surface 12 along each of the lines of weakness, thereby allowing the safety equipment 42 to be drawn out of the bag 10, 10A, 10B. It is contemplated that the perforated lines 16, 18, 20, 22 will be breached if and when thirty-five pounds of pulling force is exerted on the tab 68.

Turning to Figures 10 and 11, the bag 10C has a slide fastener 72 (also known as zipper) which allows placement or authorised retrieval of the safety equipment 42 from the bag 10C. The slide fastener 72 is associated with a tamper-evident device 74, the

details of which are disclosed in international patent application number PCT/AU2007/000929 and will not be discussed here. It should be noted that the slide fastener 72 and tamper-evident device 74 are also provided in all of the embodiments described in this specification.

- 5 Referring to Figures 12 to 14, three further embodiments of the bag 10 are shown illustrating surfaces 12A, 12B and 12C, respectively. As shown in Figure 12, surface 12A has two converging lines of weakness 106 and 108. The lines 106 and 108 join up with a somewhat rhombic area 110 defined by four lines of weakness 112, 114, 116 and 118. As shown in Figure 14, there are two pairs of converging lines of weakness 120, 122, 124 and 126 all joining up to a rhomboid area 110 similar to that shown in Figure 12. Additional lines of weakness 128, 130, 132 and 134 in this embodiment are provided to facilitate breaching of the surface 12B when the strap 92 is pulled. Turning to Figure 14, the surface 12C has a pair of lines of weakness 136 and 138. Each line 136, 138 has a first inclined section 140, a horizontal middle section 142 and a second inclined section 144. It is contemplated that an eyelet (not shown) is provided somewhere in the middle of the surface 12C. The eyelet may or may not be in contact with the middle section 142 of lines 136 and 138.

- Turning to Figure 15, a yet further embodiment of the bag 10 is shown having a side wall 149 and an end surface 146 which is transparent possessing two pairs of converging lines of weakness 148 and 150. The converging lines 148 and 150 join up with a rhomboid area 152 in which an eyelet 88 is located. The rhomboid area 152 is defined by additional lines of weakness 154, 156, 158 and 160.

- As an alternative, the slide fastener 72 may be associated with a wirelessly detectable tamper-evident seal, the details of which are disclosed in international patent application number PCT/AU2010/000936 and will not be discussed here. Such a seal has a wireless detectable or readable portion, such as an radio frequency (RF) chip or a surface acoustic wave (SAW) chip, which is detectable or readable from up to 1.5 metres away by a remote detector (not shown). As such, regular inspections may be carried out remotely, swiftly and efficiently with the remote detector. Also, this is advantageous in that theft may be prevented if a detector is placed near an exit of a public transport vehicle carrying one or more bags 10C.

- Those skilled in the art will appreciate that the invention described herein is susceptible to variations and modifications other than those specifically described. For example, the surface may be part of the bag or a panel of the bag. When the bag has a transparent part, this is in the form of a panel forming the surface. Each line of weakness may be

formed in any suitable way, including scoring, perforating, or a combination thereof. Each line of weakness may also take the form of a plurality of holes or depressions. Furthermore, the lines of weakness converge but may do so without actually meeting. Other than those illustrated in the accompanying drawings, the lines of weakness may
5 present in various patterns. All such variations and modifications are to be considered within the scope and spirit of the present invention the nature of which is to be determined from the foregoing description.

Industrial Applicability

The bag of the present invention is industrially applicable as it is capable of enabling a
10 passenger in for example an aircraft to gain access to a safety equipment such as a safety jacket contained within the bag easily and swiftly in case of emergency.

Claims

1. A bag for containing safety equipment, the bag including:
a surface having at least first and second lines of weakness;
a slot directly or indirectly associated with the lines of weakness;
5 wherein the first line of weakness and the second line of weakness converge.
2. The bag of claim 1, which has a side wall, the slot being generally perpendicular to the side wall, and the first and second lines of weakness being inclined to the side wall.
3. The bag of either claim 1 or 2, wherein the surface is transparent.
- 10 4. The bag of any one of the preceding claims, wherein each line of weakness is formed by a plurality of holes, depressions, scorelines, perforations, or a combination thereof.
5. The bag of any one of the preceding claims, wherein the lines of weakness do not meet.
- 15 6. The bag of any one of the preceding claims, wherein the surface includes one or more additional lines of weakness.
7. The bag of any one of the preceding claims, wherein the slot in use is closed or substantially closed.
8. The bag of any one of the preceding claims, wherein the slot is reinforced.
- 20 9. The bag of any one of claims 1 to 7, wherein the slot is defined by an eyelet.
10. The bag of claim 9, wherein the eyelet is made of metal and has a sharp edge.
11. The bag of any of the preceding claims, wherein the slot is adapted to allow an extension associated with the safety equipment to be exposed outside of the bag.
12. The bag of claim 11, wherein a portion of the extension is attached to at least part
25 of the slot.
13. The bag of either claim 9 or 10, which has a breaching mechanism including a strap and a hampering means.
14. The bag of claim 13, wherein the strap has one end passing through the eyelet and in use being exposed outside of the bag.

15. The bag of either claim 13 or 14, wherein the strap has an opposite end being attached to the interior of the bag.
16. The bag of any one of claims 13 to 15, wherein the strap is operatively connected to an elastic band adapted to hold the safety equipment.
- 5 17. The bag of any one of claims 13 to 17, wherein the hampering means is connected to the strap and located between the eyelet and the elastic band.
18. The bag of any one of the preceding claims, wherein the slot is located in the centre of the surface.
19. The bag of any one of the preceding claims, wherein each line of weakness
10 extends from the slot to an edge of the surface.
20. The bag of any one of claims 11, 12 and 14 to 18, wherein the lines of weakness are configured and arranged such that pulling of the extension of claims 11 and 12 or the strap of claims 14 to 18 causes breaking of the stitching and breach of the surface along each of the lines of weakness.
- 15 21. The bag of any one of the preceding claims, which also includes a plurality of holes on another surface, the holes being adapted to facilitate attachment of the bag to a fixture.
22. The bag of any one of the preceding claims, wherein the bag includes a slide fastener adapted to allow placement or authorised retrieval of the safety
20 equipment from the bag.
23. The bag of claim 22, wherein the slide fastener is associated with a tamper-evident device.
24. The bag of claim 23, wherein the tamper evident device is a wirelessly detectable tamper-evident seal.
- 25 25. The bag of any one of the preceding claims, wherein the safety equipment includes a life jacket, a fire blanket or a foldable escape ladder.
26. A bag substantially as herein described with reference to any one of the accompanying drawings.