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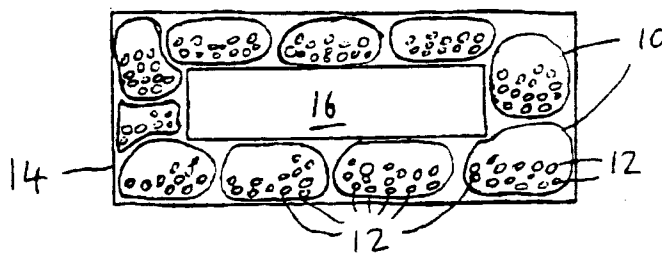
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(54) **A packaging article**

(57) A packaging article comprises a bag 10 which is gas tight and inflated with gas. The bag 10 contains resilient pieces 12;20 of expanded polystyrene or shredded paper. The volume of pieces 12;20 may be less than three-quarters of the volume of the bag 10. The level of

inflation and volume of pieces 12;20 is such that deformation of the bag 10 is resisted by the gas alone, the pieces 12;20 providing secondary protection. In another embodiment the pieces 12;20 may be omitted and the bag 10 may include a resilient sheet 18.

Fig.1



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Description

The invention relates to a packaging article.

It is known to package delicate or fragile items in a box with expanded polystyrene pieces. These pieces tend to scatter when the box is opened and the item removed and must be then be tidied up. In order to overcome this problem it has been proposed in GB2245254 to provide the pieces in perforated bags to make them easier to handle. The perforated bags are completely filled with expanded polystyrene pieces so that they can be packed tightly around an article to be protected.

While the known expanded polystyrene pieces are resilient, a substantial level of shock can still be transferred through the pieces to a packaged item. Another known way of packaging fragile articles is to use pillows of air. This provides greater resistance to shock due to the higher compressibility of the air. However, if a pillow bursts or is damaged in handling and deflates, then all protection is lost.

According to one aspect of the invention there is provided a packaging article comprising a flexible gas tight bag inflated with gas and containing a plurality of loose pieces, the volume of the pieces being less than three-quarters of the maximum volume of the bag.

In this way, the high resistance to shock of an air pillow is obtained, but there is still basic protection by means of the enclosed pieces if the bag should burst or be damaged causing it to deflate.

According to another aspect of the invention there is provided a packaging article comprising a gas tight bag inflated with gas, one or both sides of the bag consisting of bubblewrap sheet.

In this way, the high resistance to shock of an air pillow is obtained, but there is still basic protection by means of the bubblewrap if the bag should burst or be damaged causing it to deflate.

The bag may include a plurality of, preferably, resilient pieces. One or more pieces may be provided inside at least one bubble, rather than inside the main inflated cavity of the bag. Preferably pieces are provided in a plurality of bubbles, preferably in an even distribution. At least one piece may be provided in every bubble. In this way the bubblewrap will ensure an even distribution of protection by the pieces.

Alternatively or additionally the pieces may be provided inside the main inflated cavity of the bag.

The volume of the pieces in relation to the volume of the bag may be any suitable fraction consistent with enabling the benefit of the air inflation to be realised when the bag is intact and providing protection through the pieces when the bag is deflated. Clearly if there are too many pieces, they will more or less rigidly bridge the bag and shock could still be transmitted. The volume of the pieces may suitably be less than three quarters of the volume of the bag.

If there are too few pieces, then if the bag deflates, the pieces will not protect the whole of the item and there

will be gaps in protection of the item through which it could be damaged. The volume of pieces may be less than half of the volume of the bag. The volume of the pieces is preferably at least one-tenth of the volume of the bag, preferably at least one-third of the volume of the bag.

The bag is preferably inflated to at least 70% of its volume.

The ratio between the level of inflation and the volume of pieces in the bag may be important. The volume of pieces may be 20-70% of the inflated volume of the bag, suitably 40-50%.

The pieces may be non-resilient and made of, for example, glass, ceramic plastic or sand. preferably however, the pieces are resilient. In this case frictional movement of the pieces or particles will absorb energy. The resilient pieces may be of any suitable type. The resilient pieces are preferably of expanded polystyrene which may be in the form of moulded beads or shreds. Or alternatively the resilient pieces may be shredded paper, bags of air, bags of gel, pieces of foam rubber, or any other suitable material.

The bag may be of any suitable size. However, if a large bag deflates, a large area of the item is reliant upon the secondary protection of the resilient pieces. It is therefore preferred that the bag should be relatively small so that if one deflates, its neighbours will still provide protection. Preferably, the maximum dimension of the bag is less than 150mm preferably less than 100mm.

The pieces, if loose, may collect to the bottom of the bag. This is not a problem on a flat top of an item or under an item, but may be a problem at the sides of an item to be protected. While an impact would tend to spread the pieces to cover the item, if larger bags are being used an impact could arise in the deflated top of the bag avoiding the pieces and damaging the item.

According to another aspect of the invention there is provided a packaging article comprising a gas tight bag inflated with gas and including a resilient sheet loose inside the bag.

The resilient sheet will thus stand upright at the side of an item to provide extra protection even at the top of a deflated bag.

The sheet may be sufficiently rigid to retain its shape under its own weight, such as corrugated board or a suitable foam sheet. In that case, the sheet may be loose within the bag. Alternatively, the sheet may be flexible, such as other types of foam or bubble wrap.

Embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is an elevation in cross-section of an article packaged using bags according to a first embodiment of the invention;

Fig. 2 is an elevation in cross-section of an article packed with bags according to a second embodiment of the invention;

Fig. 3 is an elevation in cross-section of a spark plug and two bags according to a third embodiment of the invention;

Fig. 4 is the view of Fig. 3 with the bags around the spark plug and, showing a box;

Fig. 5 is the view of Fig. 4 with the bags and spark plug inserted into the box;

Fig. 6 is an elevation in cross-section of an article packaged using bags according to a fourth embodiment of the invention;

Fig. 7 is an elevation in cross-section of an article packed with bags according to a fifth embodiment of the invention;

Fig. 8 is a packaging article in a sixth embodiment of the invention;

Fig. 9 is a packaging article in a seventh embodiment of the invention;

Fig. 10 is an elevation in cross-section of a spark plug and two bags according to a eighth embodiment of the invention;

Fig. 11 is the view of Fig. 10 with the bags around the spark plug and, showing a box; and,

Fig. 12 is the view of Fig. 11 with the bags and spark plug inserted into the box.

In the first embodiment, a bag 10 made, for example, of polyethylene, is filled to two-thirds of its volume with moulded expanded polystyrene beads 12 and is inflated to 70% of its volume with air and then sealed. The bag 10 when deflated is a rectangular envelope with a maximum dimension of 100mm.

In use, as shown in Fig. 1, a rectangular box 14 is opened and a plurality of the bags 10 are arranged on the floor of the box 14. The item 16 to be packed is then placed on top of the bags 10 and further bags 10 are placed around the edge of the item 16 and on top of it and the box 14 is then closed. Any movement of the item 16 within the box 14 is cushioned by the air in the bags 10 which will also act to absorb any shock impacts to the outside of the box 14, for example if it is dropped. If one of the bags 10 should burst under such an impact, or should develop a leak and deflate, the polystyrene pieces 12 will still provide a level of protection and will generally be held in place by the remains of the bag 10, in particular in the case of a leak where the hole is unlikely to be large enough for the polystyrene pieces 12 to escape. In this way, fragile items can be packed with the optimum protection from damage.

The bag 10 of the second embodiment is the same as the first embodiment except that it does not have expanded polystyrene pieces 12 inside it but instead has a sheet of corrugated board 18. The bag 10 is 80% inflated and is used in the same way. If a bag 10 should burst or become deflated then the corrugated board 18 will provide protection.

In a further embodiment shown in Figs. 3 to 5, two 120mm x 60mm bags 10 are used, the bags 10 containing shredded paper 20. Each bag 10 is 90% inflated and

half filled with shredded paper 20. The bags 10 are dimensioned to package a spark plug 22 which is sandwiched between the bags 10. The sandwich is then placed within a box 14.

5 In the fourth embodiment, a bag 10 is made, for example, of a sheet of polyethylene on one side and a sheet 8 of bubblewrap on the other side, sealed together at the edges. The bag 10 is filled to two-thirds of its volume with moulded expanded polystyrene beads 12 and 10 is inflated to 70% of its volume with air and then sealed. The bag 10 when deflated is a rectangular envelope with a maximum dimension of 100mm.

In use, as shown in Fig. 1, a rectangular box 14 is opened and a plurality of the bags 10 are arranged on the floor of the box 14. The item 16 to be packed is then placed on top of the bags 10 and further bags 10 are placed around the edge of the item 16 and on top of it and the box 14 is then closed. Any movement of the item 16 within the box 14 is cushioned by the air in the bags 20 10 which will also act to absorb any shock impacts to the outside of the box 14, for example if it is dropped. If one of the bags 10 should burst under such an impact, or should develop a leak and deflate, the polystyrene pieces 12 will still provide a level of protection and will generally be held in place by the remains of the bag 10, 25 in particular in the case of a leak where the hole is unlikely to be large enough for the polystyrene pieces 12 to escape. The bubblewrap 8 will provide a large area of protection area at the top of the bag which may have no pieces in it. In this way, fragile items can be packed with the optimum protection from damage.

The bag 10 of the fifth embodiment is the same as the first embodiment except that it does not have expanded polystyrene pieces 12 inside it but instead has 35 a sheet of corrugated board 18. The bag 10 is 80% inflated and is used in the same way. If a bag 10 should burst or become deflated then the corrugated board 18 will provide protection.

In a further embodiment the bag may be empty and the envelope to form the bag 10 may be made entirely 40 of bubblewrap 8, as shown in Fig. 8. In this case, if the bag deflates then the bubblewrap 8 will provide protection. As further protection the bubblewrap bag may have resilient pieces inside it. As shown is Fig. 9 in a further 45 embodiment, the inflated bag has only one side made of bubblewrap 8, but each bubble 4 of the bubblewrap includes a resilient piece in the form of an expanded polystyrene head 2.

A further embodiment is shown in Figs. 10 to 12. 50 Here two 120mm x 60mm bags 10 are used, the bags 10 containing shredded paper 20 and one side of each bag 10 being made of bubblewrap 8. Each bag 10 is 90% inflated and half filled with shredded paper 20. The bags 10 are dimensioned to package a spark plug 22 55 which is sandwiched between the bags 10. The sandwich is then placed within a box 14.

Claims

1. A packaging article comprising a flexible gas tight bag inflated with gas and containing a plurality of loose pieces, the volume of the pieces being less than three-quarters of the maximum volume of the bag. 5
2. A packaging article comprising a gas tight bag inflated with gas, one or both sides of the bag consisting of bubblewrap sheet. 10
3. A packaging article as claimed in claim 2, wherein the bag contains within its main inflated cavity a plurality of loose pieces. 15
4. A packaging article as claimed in claim 3, wherein the volume of the pieces is less than three-quarters of the maximum volume of the bag. 20
5. A packaging article as claimed in claim 1, 3 or 4, wherein the volume of pieces is 10-80% of the inflated volume of the bag.
6. A packaging article as claimed in claim 1 or any of claims 3, 4 or 5, wherein the pieces are resilient. 25
7. A packaging article as claimed in claim 6, wherein the resilient pieces are of expanded polystyrene or shredded paper. 30
8. A packaging article as claimed in any preceding claim, wherein the bag is inflated to at least 70% of its maximum volume. 35
9. A packaging article as claimed in any preceding claim and including a resilient sheet loose inside the bag such as bubblewrap or corrugated board.
10. A packaging article comprising a gas tight bag inflated with gas and including a resilient sheet loose inside the bag such as bubblewrap or corrugated board. 40

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Fig. 1

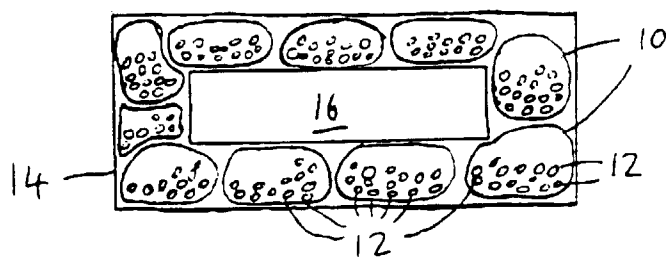
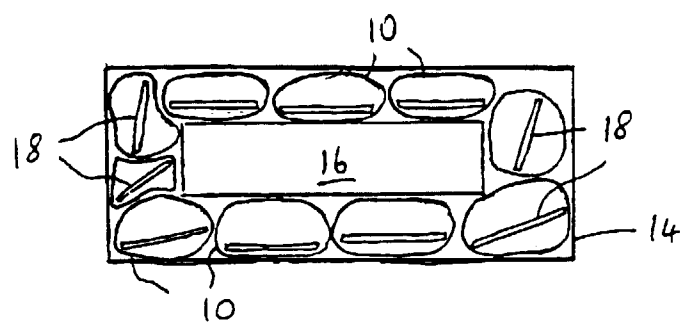


Fig. 2



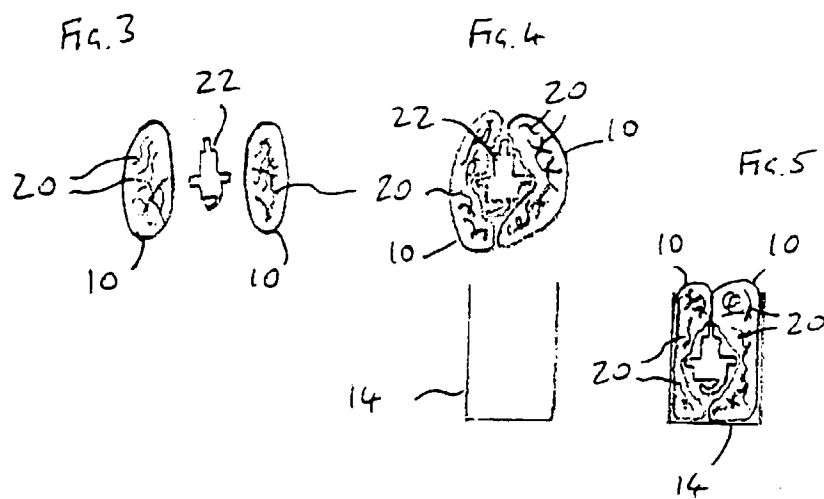


FIG. 6

