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(54) **Container bag.**

(57) A container bag (10) designed to be inflated before or during filling characterised in that a pressure relief valve (22) is incorporated or incorporatable into the bag body, the valve being connectible to a receiver for exhausted powder or pulverulent matter. The pressure relief valve can be set to give a desired inflation pressure in the FIBC but will permit air to escape above this pressure thereby ensuring that the stitching and seams of the FIBC are not over-stressed to the point of leakage. The valve is connectible to, and preferably is connected to, a receiver for any vented gases and entrained powder. Preferably the receiver is the filling silo (28) so that any expelled powder is returned for refilling.

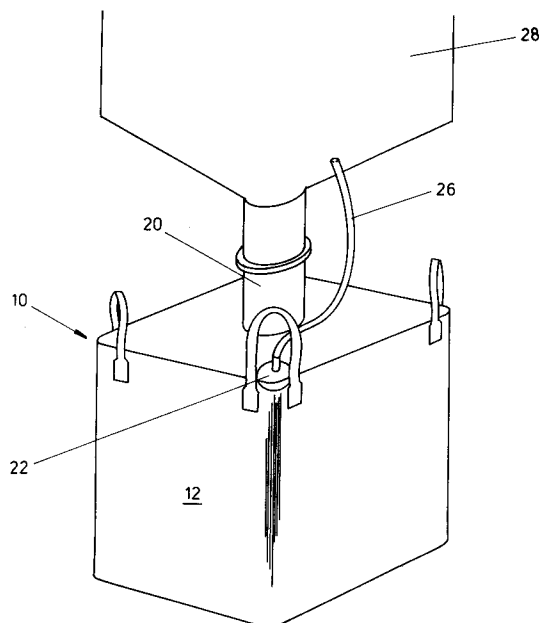


FIG. 3

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This invention relates to container bags and in particular relates to container bags for carrying loads in the range of one half to two tonnes and known as flexible intermediate bulk containers (FIBC's).

Flexible intermediate bulk containers are increasingly employed in cargo handling and transporting situations, especially for the carriage of particulate or pulverulent material. A typical FIBC will be manufactured from a fabric woven from a polyolefin tape and have integral lifting loops. Examples of such containers are described in UK patent numbers 1591091 and 2063816. FIBC's have to meet various national and international safety standards; for example, it is normal to require a five to one safety ratio, that is an IBC rated at one tonne should not break under loads of less than five tonnes.

A recent trend in the FIBC field has been the increasing usage of extrusion coated fabrics in the manufacture of FIBC's to give moisture resistance without the requirement of a separate polyethylene liner. Extrusion coated FIBC's are not completely waterproof owing to the holes created by needle penetration during sewing in making up. However, designs for extrusion coated FIBC's have been proposed wherein very fine threads are employed and stuffer threads are used to fill the needle holes thereby giving much improved resistance to the passage of air water or vapour.

More and more users are inflating the FIBC's prior to filling which is good practice to ensure even filling. For various reasons some users are inflating FIBC's to very high pressures and, in the absence of a polythene liner, the pressurised air can force its way through the finest of stitching and, where the filling product is a fine powder, entrained powder can be taken through with the air thus affecting the environment in the region of the filling machines. This is an especial problem where the contents are chemicals or fertilisers which may be noxious or otherwise harmful.

The invention seeks to provide a container bag improved in the above respect.

According to the present invention there is provided a container bag designed to be inflated before or during filling characterised in that a pressure relief valve is incorporated or incorporatable into the bag body, the valve being connectible to a receiver for exhausted powder or pulverulent matter.

The pressure relief valve can be set to give a desired inflation pressure in the FIBC but will permit air to escape above this pressure thereby ensuring that the stitching and seams of the FIBC are not over-stressed to the point of leakage. The valve is connectible to, and preferably is connected to, a receiver for any vented gases and entrained pow-

der. Preferably the receiver is the filling silo so that any expelled powder is returned for refilling.

The pressure relief valve can be located anywhere on the FIBC but ideally is positioned on the top edge either along the edge where the top is attached to the body of the FIBC or in one of the corners of the top edge, for the convenience of attaching the tube thereto to lead vented gases and any entrained powder to the receiver. The pressure relief valve can be of various types as conventionally known and can be either sewn in, welded or glued into the fabric.

In an alternative construction, the valve is present on a tube or the like associated with the filling machine, and the FIBC is simply provided with means connectible to the valve, e.g. a disc or other area capable of receiving the valve. In this way the number of valves required is greatly reduced.

The FIBC of the invention may be otherwise any of the conventionally known types but will normally be extrusion coated to render it air or water tight. The invention is equally applicable to FIBC's having or not having a liner e.g. of polyethylene sheet material.

The fabric from which the FIBC of the invention is formed may be a conventional fabric for use in this type of container and may be woven from polyethylene or polypropylene tape yarns or polyester coated yarns. The side walls of the container may be made from a fabric having reinforced zones or areas of interwoven reinforcing yarns for example as disclosed in our UK patent number 1591091 to which the lifting loops will normally be attached. The lifting loops will preferably be of a woven webbing of synthetic yarns, for example of the type used for car seat belts, for example polypropylene, polyamide or polyester yarns, or may be ropes or hawsers of suitable strength.

The container bag of the invention may be fitted with a top and/or a filling spout, as well as a discharge spout, as is conventional in the FIBC art.

The invention will be described further, moreover by example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of an FIBC of the invention;

Figure 2 is a detail from Figure 1; and

Figure 3 is a similar view to Figure 1 illustrating the filling process.

Referring to the drawings, an FIBC generally designated 10 has side walls 12 and a base 14. The fabric from which the side walls and base are formed will generally be a woven polyolefin fabric which has been extrusion coated to render it air and water resistant. Lifting loops 16 are provided across each corner and are stitched to respective side walls (which may contain reinforced zones to

which the lifting loop 16 are attached). The stitching is preferably carried out in such a way as to minimise leakage, e.g. by use of fine threads and stuffer threads.

The bag 10 has a top 18 with a filler spout 20 as is conventional in this field.

In accordance with the invention, a pressure relief valve 22 is sewn, glued or welded into the bag fabric comprising the top 18 adjacent one corner. The pressure relief valve 22 has means 24 connectible to a pipe or tube 26 (see Figure 3) for ducting exhausted gases and entrained powder to a receiver.

As can be seen from Figure 3, when the bag 10 is being filled the spout 20 is connected to a filling silo 28. Before or during the filling of the bag air, or other gas such as nitrogen, under pressure, is forced into the bag thereby inflating it, and filling of the pulverulent or powdery material commences. If the pressure within the bag exceeds the predetermined setting of the relief valve 22 (which should be chosen to be below the pressure at which air will be forced through the seams of the bag 10) excess air is ducted via the tube 26 back into the silo so that any entrained powder is returned for re-use instead of being released into the atmosphere. Alternatively, the tube 26 could be led to another suitable receiver whereby the entrained powder is kept out of the atmosphere surrounding the filling machine, or could even be vented to waste if circumstances dictate this.

The FIBC of the invention provides a simple and economical solution to the problem of leakage at filling stations where high pressure inflation is employed.

Claims

1. A flexible intermediate container bag designed to be inflated before or during filling with powdery or pulverulent material characterised in that a pressure relief valve is incorporated into the bag body, or the bag body is provided with receiving means connectable to a pressure relief valve, the valve being connectible to a receiver for exhausted powder or pulverulent matter.

2. A bag as claimed in claim 1 in which, in use, the valve is connected to a receiver for any vented gases and entrained powder.

3. A bag as claimed in claim 2 in which the receiver is the filling silo from which the bag is being filled so that any expelled powder is returned for refilling.

4. A bag as claimed in any of claims 1 to 3 in which the pressure relief valve is positioned on the top edge either along the edge where the top is attached to the body of the FIBC or in one of the corners of the top edge.

5. A bag as claimed in any of claims 1 to 4 in which the pressure relief valve is either sewn in, welded or glued into the fabric.

5. A bag as claimed in any of claims 1 to 3 in which the valve is present in a tube or the like associated with the filling machine, and the bag is provided with a disc or other area capable of receiving the valve or attaching to the tube.

6. A bag as claimed in any of claims 1 to 5 in which the bag fabric is extrusion coated to render it air or water tight.

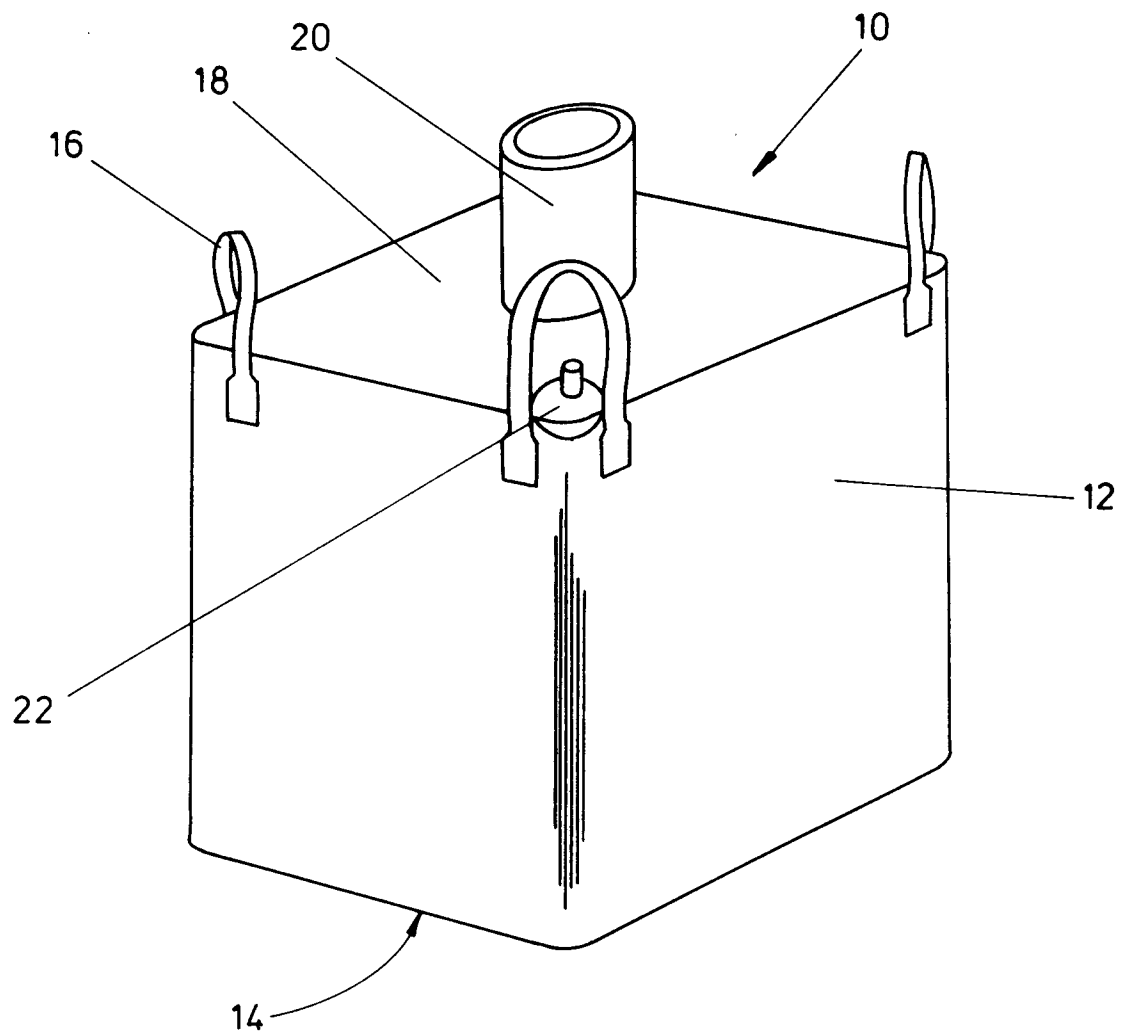


FIG. 1

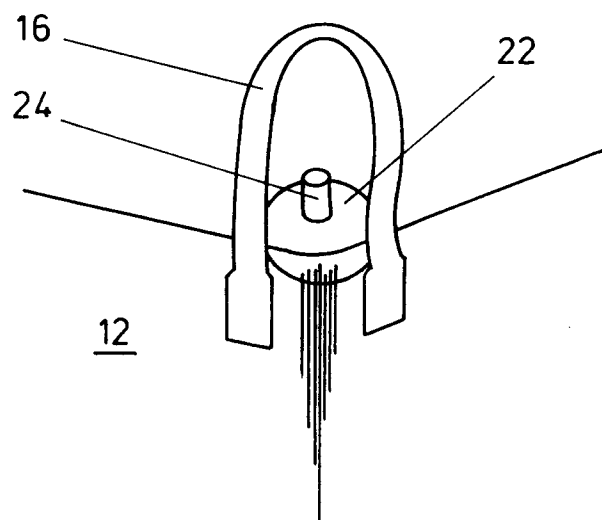


FIG. 2

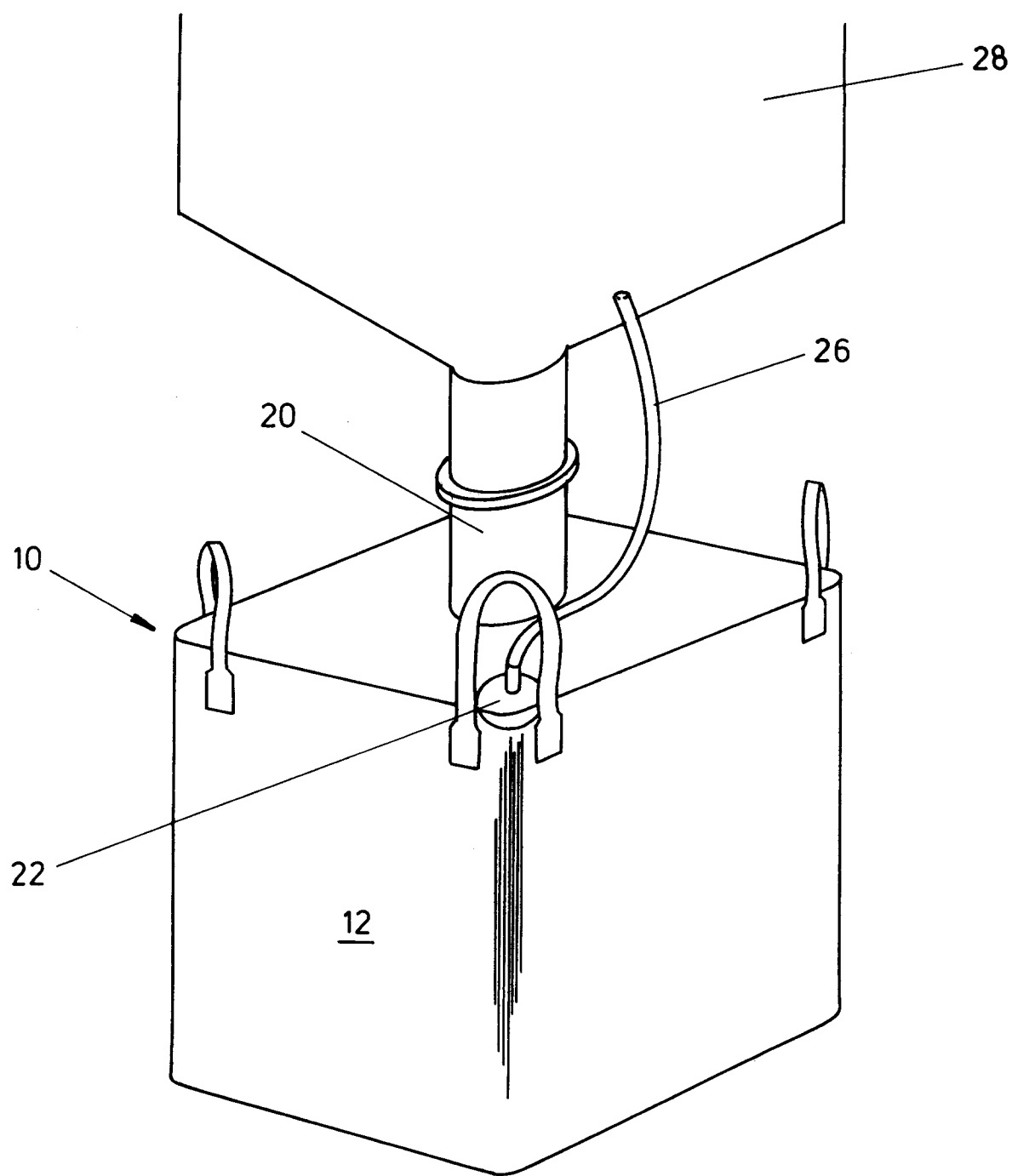


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 93113780.6
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	<u>DE - A - 3 613 394</u> (CLAUDIUS PETERS AG) * Totality *	1, 2	B 65 D 88/16
A	--	3-6	
Y	<u>GB - A - 2 115 794</u> (AZO-MASCHINENFABRIK ADOLF ZIMMERMANN GMBH) * Totality *	1, 2	
A	<u>US - A - 4 232 803</u> (MULLER et al.) * Abstract; fig. 1 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D B 65 B
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 13-12-1993	Examiner WIDHALM
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	