

(19)



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(11)

EP 0 922 638 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.06.1999 Bulletin 1999/24

(51) Int Cl.⁶: **B65B 1/18, B65D 33/01**

(21) Application number: **99100491.2**

(22) Date of filing: **10.10.1995**

(84) Designated Contracting States:
BE DE DK ES FR GB IT SE

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(30) Priority: **10.10.1994 SE 9403434**

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(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
95850175.1 / 0 706 940

Remarks:

This application was filed on 12 - 01 - 1999 as a
divisional application to the application mentioned
under INID code 62.

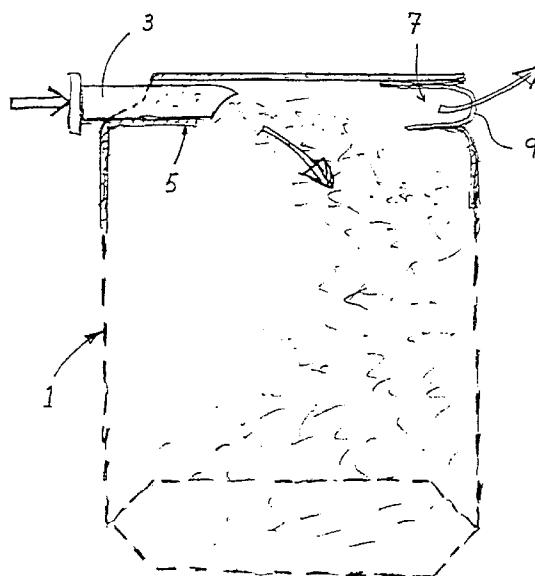
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(54) Method for filling a valve bag, and a valve bag

(57) When filling a valve bag (1) with dust-producing or hazardous material through a filling valve (5) arranged in a corner of the bag, use is made of a ventilating valve (7) for evacuation of air, arranged in the opposite corner of the bag and having a transversely folded filtering sheet (9), whose transverse fold faces outwards such that during evacuation of air the ventilating valve (7) opens in U-shape from the inside. After the filling operation, the filling valve (5) is directly sealed, whereupon final evacuation of air, for instance by mangling, occurs through the ventilating valve.

FIG. 1



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Description

Technical Field

[0001] The present invention relates to the filling of a valve bag with dust-producing and/or hazardous material, and a valve bag, preferably of the so-called canister type, which is particularly suitable for such use.

Technical Background

[0002] Valve bags are generally used for the transport of various materials. When dust-producing and/or hazardous materials are involved, it is essential that there be no leakage of material to the surroundings when filling the bag with the material and in the subsequent handling. This results in problems especially in the filling operation, when large amounts of air pass into a bag together with the material at issue. The excess pressure arising in the bag involves great risks of leakage to the surroundings and prevents the filling operation from occurring at the desired speed.

[0003] Various forms of evacuation of air from the bags in connection with the filling operation have been suggested. It is common practice to use suitably perforated bags, which involves a risk of leakage. Besides, the evacuation of air will in many cases be unsatisfactory. Experiments have been made with special ventilating means in or in connection with the bag, but in most cases these have been found not to give the desired result.

Object of the Invention

[0004] The object of the present invention is to provide a new filling method and a valve bag which is especially suited for this, thereby alleviating the above-mentioned problems to a considerable degree.

Summary of the Invention

[0005] The above-mentioned object is achieved by a method and a valve bag having the features recited in the accompanying claims.

[0006] The invention is thus based on the knowledge that emission of material from the bag to the surroundings - during and after filling - can be kept under extreme control while the filling operation can be carried out in a highly efficient manner by using a tight or non-perforated bag fitted with a special filtering ventilating valve in the bag corner opposite the normal corner-mounted filling valve of the bag. Preferably, the filling valve is sealed immediately after the filling operation. Final evacuation of air, for instance by conventional mangling of the filled bag, is advantageously carried out after said sealing of the filling valve, thereby preventing emission of material through the filling valve both in connection with the ending of the filling operation and during the subsequent

handling of the bag.

[0007] As will be immediately realised by those skilled in the art, the filling valve can be sealed in various ways, for instance by means of an externally applied sealing strip or, which at present seems to be preferred, by means arranged inside the filling valve, the sealing effect of these means being achieved by applying, for instance, heat and/or pressure.

[0008] To ensure the desired ventilation effect, the ventilating valve according to the invention is a valve fitted with a filtering valve sheet which is transversely folded, its fold facing outwards from the interior of the bag. Such a filtering valve sheet can be very easily mounted in substantially the same manner as a filling valve sheet (which is longitudinally folded) in a conventional so-called valve assembly in a bag-making machine. The filtering valve sheet may advantageously be made of crepe filtering paper, although also non-woven fabric could be used.

[0009] Use of the invention has been found to yield improved evacuation of air and, thus, more efficient filling while reducing the emission problems to a considerable extent.

[0010] The invention will now be described in more detail by way of an embodiment, reference being made to the accompanying drawings.

Brief Description of the Drawings

[0011] Fig. 1 is a schematic view, partly in section, which illustrates an example of filling a bag according to the present invention.

[0012] Fig. 2 is a top plan view of the bottom part of an embodiment of a canister-type bag according to the invention, illustrating the position of the transversely folded filtering valve sheet and the filling valve sheet not yet folded, and the associated underlying glue layers.

[0013] Fig. 3 is a view similar to Fig. 2 and illustrates the applied bottom glue layers before the terminating bottom folding and the application and gluing of a bottom cover sheet (not shown).

Description of an Embodiment

[0014] Fig. 1 schematically illustrates the filling of a bag 1 according to the present invention. A filling nozzle 3 is inserted into the filling valve 5 of the bag in one upper corner of the bag. Material is injected under pressure through the filling pipe 3, also air being entrained and generating an excess pressure in the bag, which is here assumed to be completely tight, except for a ventilating valve 7 arranged in the other upper corner of the bag and consisting of a filtering sheet of paper 9 attached by gluing. The ventilating valve is opened or expanded by the excess pressure so as to expose a large filtering surface, by the filtering sheet being given U-shape (in section), and air leaves through the base of the U, said base being non-glued and therefore being able to provide a

large evacuation area. The end of the filling pipe 3 is bent to impart to the injected material a direction obliquely downwards in the bag, i.e. away from the ventilating valve. It has surprisingly been found that a ventilating valve according to the invention does not tend to be quickly filled or clogged by injected material, but, on the contrary, yield efficient evacuation of air during the entire filling operation. No active sucking-out of air is necessary. When the required amount of material has been injected, the filling pipe 3 can be pulled out of the filling valve 5 which can be immediately sealed, for instance by means of transversely applied bands of selectively activatable sealing material, advantageously of the hot-melt type. Then, a direct, active, terminating continued evacuation of air from the bag may take place through the ventilating air, preferably by mangling of the bag.

[0015] Figs 2 and 3 illustrate an example how to modify according to the present invention a conventional valve bag of the canister type. Since valve bags of this type are well-known, merely modifications which are important to the invention will be discussed in more detail.

[0016] Fig. 2 illustrates how an unfolded filling valve sheet 11 and a transversely folded filtering valve sheet 9 are glued on each side of the bag to the underlying flat-folded bag side flaps. The glue layers of the filling valve sheet 11 are indicated at 13, 14, and the glue layers of the lower part of the filtering valve sheet 9 are indicated at 15.

[0017] The filtering valve sheet 9 has its transverse fold 17 on the outwardly facing side of the sheet. As is apparent, the glue layer 15 begins at a considerable distance from the fold 17, such that a comparatively large non-glued area of the lower part of the sheet connects with the fold 17. This also applies to the upper part of the sheet 9, see Fig. 3.

[0018] The lower part of the filtering sheet 9 extends into the bag a shorter distance than does the upper part of the sheet. The inner edge of the lower part is indicated at 19. The innermost edge area of the lower part advantageously extends beyond the underlying side flap. Especially if this is not possible in view of the width of the bag, a corresponding recess can be formed in the side flap, thereby ensuring free exposure of the innermost edge area of the lower part of the filtering sheet 9.

[0019] Fig. 2 schematically shows also the arrangement of additional, transverse, selectively heat-activatable sealing agent bands 21, 22 on the underside of the filling valve sheet 11, i.e. inside the filling valve itself.

[0020] Fig. 3 shows how the bottom gluing can be carried out. It is apparent that the bottom glue layer 23 can basically be the same for the filling valve sheet 11 and the filtering valve sheet 9, although additional transverse glue bands 25, 26 are arranged for the inner part of the filtering sheet upper part, such that this is safely glued to the bottom of the bag and thus follows this, whereby the U-shaped opening (see Fig. 1) of the ventilating valve will be facilitated.

[0021] As is apparent, also the upper part of the filtering sheet 9 has a comparatively large non-glued area connecting with the transverse fold 17. The non-glued areas on both sides of the transverse fold 17 permit a large evacuation area to be formed, when the ventilating valve is opened from the inside into U-shape.

[0022] It will be appreciated that a bottom cover sheet (not shown) glued farthest out should either not cover the above-mentioned non-glued area or, non-glued, cover the same.

[0023] As mentioned above, it is preferred that the bag is made of a tight or non-perforated material. The invention thus makes it possible to use tight plastic bags, while maintaining the ventilating effect during filling.

[0024] When paper bags are involved, the fact that there are no perforations may confer several advantages, such as a reduced risk of broken webs in the bag-making machine and no bleeding-through.

[0025] A more efficient evacuation of air and no perforations may permit the use of thinner bag materials.

[0026] The use of non-perforated bags generally leads to reduced emission while emptying the bags and handling the emptied bags.

[0027] It thus appears to be a great advantage to be able to use tight or non-perforated bags. However, it should be emphasised that if tightness or lack of perforations is not primarily necessary, the invention may in any case be used since the evacuation of air is rendered more effective, which results in certain advantages, for example, the possibility of quicker filling and simpler and lighter mangling.

Claims

1. A method for filling a valve bag with dust-producing and/or hazardous material, the material being supplied through a bag-filling valve arranged in a corner of one end of the bag, and air which accompanies the material supplied into the bag being removed through ventilating means arranged in the bag, comprising using a bag of a tight material, such as non-perforated paper or plastic, said bag having ventilating means in the form of a filtering bag ventilating valve in the opposite corner of said one end of the bag, **characterized** by using a bag fitted with a bag ventilating valve comprising a transversely folded filtering valve sheet, the sheet fold facing outwards from the interior of the bag, and opening said bag ventilating valve so as to expose a large filtering surface, preferably by giving the filtering valve sheet sectional U-shape, by means of an excess pressure in the bag, by filling the bag by injection of material obliquely downwards in the bag, while evacuation of air occurs through the bag ventilating valve.
2. A method as claimed in claim 1, **characterized** by sealing, after filling, the filling valve and actively fi-

nally-evacuating the air from the filled bag.

3. The method as claimed in claim 2, **characterized**
in that the final evacuation of air comprises man-
gling of the filled bag. 5
4. The method as claimed in claim 3, **characterized**
in that mangling is carried out after sealing of the
filling valve. 10
5. The method as claimed in claim 2 or 3, **character-
ized** in that the final evacuation of air occurs before
the used filling nozzle or the like is removed from
the filling valve, and the filling valve is then directly
sealed. 15
6. A valve bag, especially of the so-called canister
type, comprising a filling valve in one corner of one
end of the bag and ventilating means in the other
corner of said one end, the valve bag preferably be- 20
ing made of a tight or non-perforated material, **char-
acterized** in that said ventilating means is a venti-
lating valve having an air-permeable, transversely
folded filtering valve sheet, the fold of which faces
outwards from the interior of the bag and is adapted 25
to be expanded by an excess pressure in the bag,
so as to expose a large filtering valve sheet surface.
7. The valve bag as claimed in claim 6, **characterized**
in that the filtering valve sheet is non-glued within a 30
substantial area on both sides of the fold of the
sheet, such that the filtering valve sheet can as-
sume, during evacuation of air, a configuration hav-
ing a U-shaped, inwardly open section perpendicu-
lar to its fold. 35
8. The valve bag as claimed in claim 6 or 7, **charac-
terized** in that the lower part, facing the interior of
the bag, of the filtering valve sheet extends a shorter
distance into the bag than does its upper part facing 40
the exterior, preferably beyond the inner edge of the
turned-in bag flap or over a recess in the inner edge
area of the bag flap
9. The valve bag as claimed in any one of claims 6-8, 45
characterized in that the inner part of the upper
part, facing the outside, of the filtering valve sheet
is glued to the bottom of the bag.
10. The valve bag is claimed in any one of claims 6-9, 50
characterized in that the filling valve comprises
sealing means for sealing the filling valve after filling
of the bag.

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FIG. 1

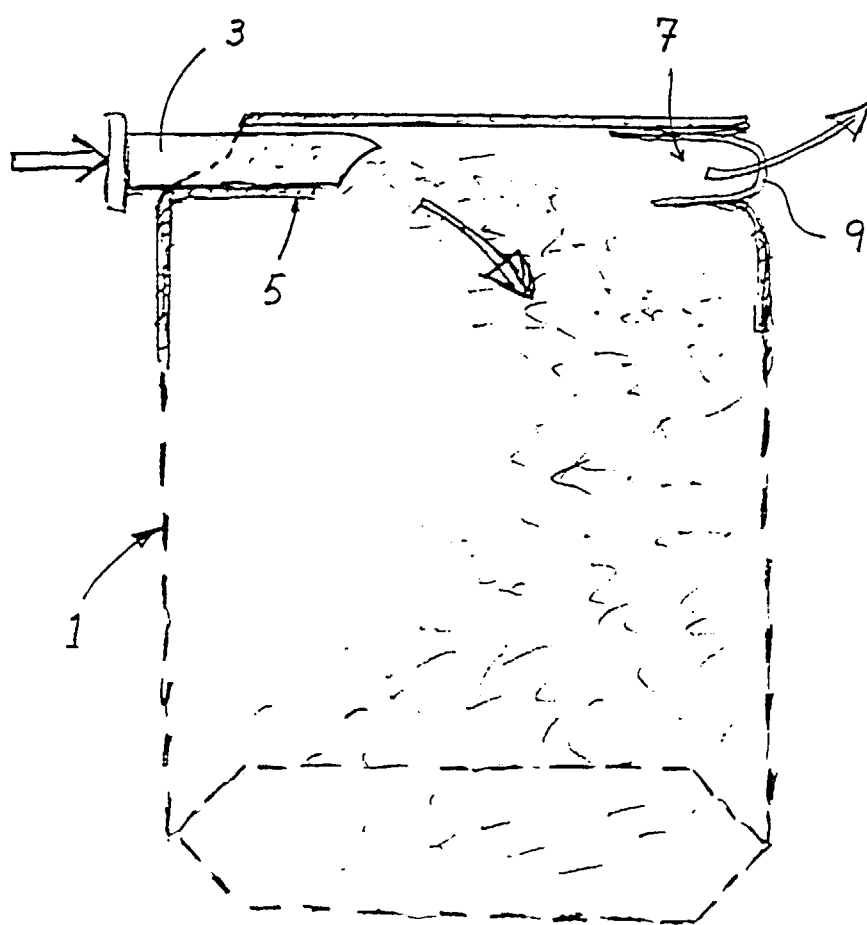


FIG. 2

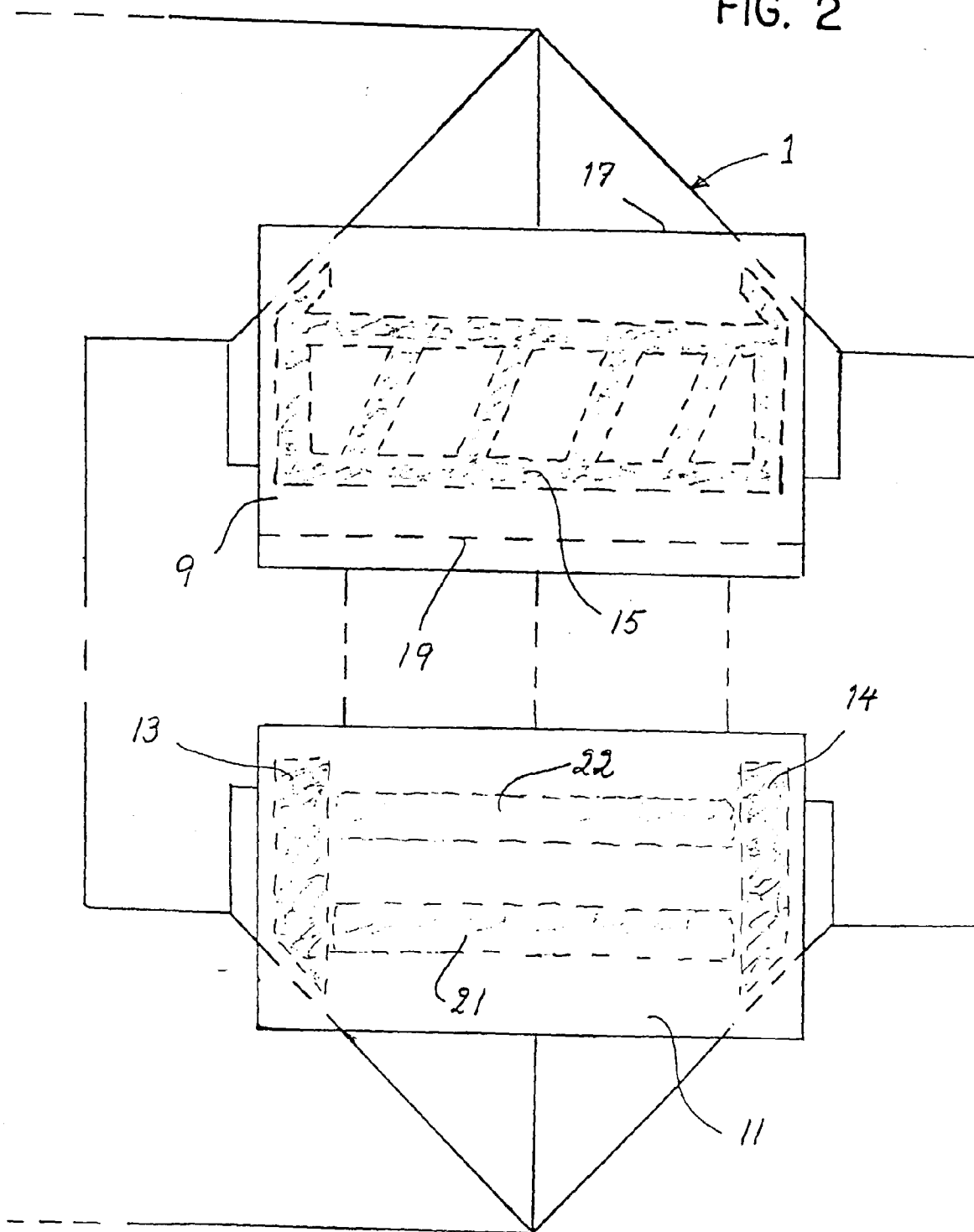


FIG. 3

