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(54) **A method of filling a valve bag and valve bag**

Verfahren zum Füllen eines Ventilsacks und Ventilsack

Procédé de remplissage d'un sac à valve et sac à valve

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(56) References cited:
DE-A- 4 140 213

FR-A- 657 508

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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.

[0004] DE-A-41 40 213 discloses a valve bag comprising a filler valve in one corner of one end of the bag and a ventilating valve in the other corner of said one end.

Object of the Invention

[0005] 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

[0006] The above-mentioned object is achieved by a method and a valve bag having the features recited in the accompanying claims.

[0007] 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, said filling valve being 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.

[0008] 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.

[0009] To ensure the desired ventilation effect, the ventilating valve according to the invention advantageously 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.

[0010] 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.

[0011] 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

[0012]

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

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.

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

[0013] 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 venti-

lating 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.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] Fig. 3 shows how the bottom gluing can be car-

ried 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] A more efficient evacuation of air and no perforations may permit the use of thinner bag materials.

[0025] The use of non-perforated bags generally leads to reduced emission while emptying the bags and handling the emptied bags.

[0026] 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 (1) with dust-producing and/or hazardous material, the material being supplied through a bag-filling valve (5) 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 (7) arranged in the bag, further comprising using a bag (1) 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 (7) in the opposite corner of said one end of the bag, said bag ventilating valve (7) being opened by an excess pressure in the bag, filling the bag by injection of material obliquely downwards in the bag, while evacuation of air occurs through the bag ventilating valve (7), and, immediately after filling, sealing the

filling valve (5) and actively finally-evacuating the air from the filled bag.

2. The method as claimed in claim 1, wherein the final evacuation of air comprises mangling of the filled bag (1). 5
3. The method as claimed in claim 2, wherein mangling is carried out after sealing of the filling valve (5). 10
4. The method as claimed in claim 1 or 2, wherein the final evacuation of air occurs before the used filling nozzle (3) or the like is removed from the filling valve (5), and the filling valve is then directly sealed. 15
5. The method as claimed in any one of the preceding claims, further comprising using a bag (1) fitted with a bag ventilating valve (7) comprising a transversely folded filtering valve sheet (9), the sheet fold (17) facing outwards from the interior of the bag, such that the bag ventilating valve (7) can be expanded by an excess pressure in the bag, for exposing a large filtering valve sheet surface. 20 25
6. A valve bag (1), especially of the so-called canister type, especially for use in connection with a method according to any one of the preceding claims, comprising a filling valve (5) in one corner of one end of the bag and a ventilating valve (7) in the other corner of said one end, the valve bag (1) being made preferably of a tight or non-perforated material, **characterised** in that the filling valve (5) is provided with sealing means (21,22) to be sealed after filling of the bag thereby sealing the filling valve (5), and that said ventilating valve (7) has an air-permeable, transversely folded filtering valve sheet (9), the fold (17) of which faces outwards from the interior of the bag (1) and is adapted to be expanded by an excess pressure in the bag, so as to expose a large filtering valve sheet surface. 30 35 40
7. The valve bag as claimed in claim 6, wherein the filtering valve sheet (9) is non-glued within a substantial area on both sides of the fold (17) of the sheet, such that the filtering valve sheet (9) can assume, during evacuation of air, a configuration having a U-shaped, inwardly open section perpendicular to its fold. 45
8. The valve bag as claimed in claim 6 or 7, wherein the lower part, facing the interior of the bag, of the filtering valve sheet (9) extends a shorter distance into the bag (1) than does its upper part facing 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. 50 55

9. The valve bag as claimed in any one of claims 6-8, wherein the inner part of the upper part, facing the outside, of the filtering valve sheet (9) is glued to the bottom of the bag (1).

10. The valve bag as claimed in any one of claims 6-9, wherein said sealing means are provided inside the filling valve (5), preferably comprising transversely applied bands (21,22) of selectively activatable sealing material.

Patentansprüche

1. Verfahren zur Füllung eines Ventilsacks (1) mit Staub erzeugendem und/oder gefährlichem Material, wobei das Material durch ein Sackfüllventil (5) zugeführt wird, das in einer Ecke von einem Ende des Sacks angeordnet ist, und das in den Sack zugeführte Material begleitende Luft durch eine im Sack angeordnete Ventilereinrichtung (7) entfernt wird, ferner mit einer Anwendung eines Sacks (1) aus einem dichten Material, wie etwa nicht perforiertes Papier oder Kunststoff, wobei der Sack eine Ventilereinrichtung in der Form eines Filtersackventilerventils (7) in der gegenüberliegenden Ecke des einen Ende des Sacks hat, und das Sackventilerventil (7) durch einen Überdruck im Sack geöffnet wird, einer Füllung des Sacks durch Einblasen von Material schräg nach unten in den Sack, während eine Luftevakuierung durch das Sackventilerventil (7) geschieht, und, unmittelbar nach der Füllung, einer Abdichtung des Füllventils (5) und einer aktiven Endevakuierung der Luft aus dem gefüllten Sack.
2. Verfahren nach Anspruch 1, wobei die Endevakuierung von Luft ein Mangeln des gefüllten Sackes (1) aufweist.
3. Verfahren nach Anspruch 2, wobei das Mangeln nach einer Abdichtung des Füllventils (5) durchgeführt wird.
4. Verfahren nach Anspruch 1 oder 2, wobei die Endevakuierung von Luft geschieht, bevor die benutzte Fülldüse (3) oder dergleichen von dem Füllventil (5) abgenommen worden ist, und das Füllventil anschließend unmittelbar abgedichtet wird.
5. Verfahren nach einem der vorangegangenen Ansprüche, ferner mit einer Anwendung eines Sacks (1), der mit einem Sackventilerventil (7) zusammengepaßt ist, das einen quer gefalteten Filterventilbogen (9) aufweist, wobei die Bogenfaltung (17) ausgehend von dem Inneren des Sacks nach außen gewandt ist, so daß das Sackventilerventil (7) mittels eines Überdrucks im Sack zur Freigabe einer großen Filterventilbogenoberfläche expan-

dierbar ist.

6. Ventilsack (1) insbesondere der sogenannten Kanisterbauart insbesondere zur Anwendung in Verbindung mit einem Verfahren gemäß einem der vorangehenden Ansprüche, mit einem Füllventil (5) in einer Ecke von einem Ende des Sacks und einem Ventilierventil (7) in der anderen Ecke des einen Endes, wobei der Ventilsack (1) vorzugsweise aus einem dichten oder nicht perforierten Material gefertigt ist, **dadurch gekennzeichnet, daß das Füllventil (5) mit einer Abdichteinrichtung (21, 22) versehen ist, um nach der Füllung des Sacks abgedichtet zu werden, wodurch das Füllventil (5) abgedichtet wird, und daß das Ventilierventil (7) einen luftdurchlässigen, quer gefalteten Filterventilbogen (9) hat, wobei dessen Faltung (17) ausgehend von dem Inneren des Sacks (1) nach außen gewandt ist und angepaßt ist, um mittels eines Überdrucks im Sack zur Freigabe einer großen Filterventilbogenoberfläche expandiert zu werden.**
7. Ventilsack nach Anspruch 6, wobei der Filterventilbogen (9) innerhalb eines beträchtlichen Bereichs an beiden Seiten der Faltung (17) des Bogens nicht verklebt ist, so daß der Filterventilbogen (9) während einer Luftevakuierung eine Konfiguration einnehmen kann, die einen U-förmigen, nach innen offenen Abschnitt senkrecht zu seiner Faltung hat.
8. Ventilsack nach Anspruch 6 oder 7, wobei das dem Inneren des Sacks zugewandte untere Teil des Filterventilbogens (9) sich um eine kürzere Strecke in den Sack (1) erstreckt als sein nach außen gewandtes oberes Teil, und zwar vorzugsweise über den Innenrand des eingeschlagenen Sackflügels oder über eine Aussparung in dem Innenrandbereich des Sackflügels hinweg.
9. Ventilsack nach einem der Ansprüche 6 bis 8, wobei das innere Teil des oberen Teils, das nach außen gewandt ist, des Filterventilbogens (9) an dem Boden des Sacks (1) geklebt ist.
10. Ventilsack nach einem der Ansprüche 6 bis 9, wobei die Abdichteinrichtung innerhalb des Füllventils (5) vorgesehen ist und vorzugsweise quer aufgebrachte Streifen (21, 22) aus einem selektiv aktivierbaren Abdichtmaterial hat.

Revendications

1. Procédé pour remplir un sac (1) à valve avec un matériau produisant de la poussière et/ou un matériau dangereux, le matériau étant alimenté par l'intermédiaire d'une valve (5) de remplissage du sac disposée dans un coin d'une extrémité du sac,

et l'air, qui accompagne le matériau introduit dans le sac étant retiré par des moyens de ventilation (7) disposés dans le sac, comprenant en outre l'utilisation d'un sac (1) formé d'un matériau étanche, tel que du papier non perforé ou une matière plastique, ledit sac possédant des moyens de ventilation sous la forme d'une valve filtrante (7) pour la ventilation du sac, située dans le coin opposé de ladite première extrémité du sac, ladite valve (7) de ventilation du sac étant ouverte par une pression excessive dans le sac, le remplissage du sac par injection d'un matériau obliquement vers le bas dans le sac, tandis que l'évacuation d'air s'effectue par la valve (7) de ventilation du sac, et aussitôt après le remplissage, la fermeture étanche de la valve de remplissage (5) et le vidage final actif de l'air hors du sac rempli.

2. Procédé selon la revendication 1, selon lequel le vidage final de l'air comprend l'aplatissement du sac rempli (1).
3. Procédé selon la revendication 2, selon lequel l'aplatissement du sac est exécuté après la fermeture étanche de la valve de remplissage (5).
4. Procédé selon la revendication 1 ou 2, selon lequel le vidage final de l'air s'effectue avant que la buse utilisée de remplissage (3) ou analogue soit retirée de la valve de remplissage (5), et la valve de remplissage est ensuite directement fermée de façon étanche.
5. Procédé selon l'une quelconque des revendications précédentes, comprenant en outre l'utilisation d'un sac (1) équipé d'une valve (7) de ventilation du sac comprenant une feuille de valve filtrante (9) repliée transversalement, le repli (17) de la feuille étant dirigé de l'intérieur vers l'extérieur du sac de telle sorte que la valve (7) de ventilation du sac peut être déployée par une pression excessive dans le sac, pour l'exposition d'une surface étendue de la feuille de valve filtrante.
6. Sac (1) à valve, en particulier du type dit boîte, en particulier pour son utilisation en liaison avec un procédé selon l'une quelconque des revendications précédentes, comprenant une valve de remplissage (5) située dans un coin d'une première extrémité du sac et une valve de ventilation (7) située dans l'autre coin de ladite première extrémité, le sac (1) à valve étant formé de préférence d'un matériau étanche ou non perforé, caractérisé en ce que la valve de remplissage (5) est pourvue de moyens d'étanchéité (21,22) devant être fermés de façon étanche après le remplissage du sac, ce qui a pour effet d'étanchéifier la valve de remplissage (5), et en ce que ladite valve de ventilation (7) pos-

sède une feuille de valve filtrante (9) perméable à l'air et repliée transversalement, dont le repli (17) est tourné de l'intérieur vers l'extérieur du sac (1) et est adapté pour être déployé par une pression en excès présente dans le sac, de manière à exposer une surface étendue de feuille de valve filtrante.

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7. Sac à valve selon la revendication 6, dans lequel la feuille de valve filtrante (9) n'est pas collée dans une zone substantielle des deux côtés du pli (17) de la feuille, de sorte que la feuille de valve filtrante (9) peut prendre, pendant l'évacuation de l'air, une configuration ayant une section en forme de U, ouverte vers l'intérieur, perpendiculaire à son repli.

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8. Sac à valve selon la revendication 6 ou 7, dans lequel la partie inférieure, tournée vers l'intérieur du sac, de la feuille de valve filtrante (9) s'étend dans le sac (1) sur une distance plus faible que dans la partie supérieure tournée vers l'extérieur, de préférence au-delà du bord intérieur du rabat du sac replié vers l'intérieur ou au-dessus d'un renforcement dans la zone du bord intérieur du rabat du sac.

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9. Sac à valve selon l'une quelconque des revendications 6 à 8, dans lequel la partie intérieure de la partie supérieure, tournée vers l'extérieur, de la feuille de valve filtrante (9) est collée sur la partie inférieure du sac (1).

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10. Sac à valve selon l'une quelconque des revendications 6 à 9, dans lequel lesdits moyens d'étanchéité sont prévus à l'intérieur de la valve de remplissage (5), et comprennent de préférence des bandes (21,22) appliquées transversalement et formées d'un matériau d'étanchéité pouvant être activé de façon sélective.

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FIG. 1

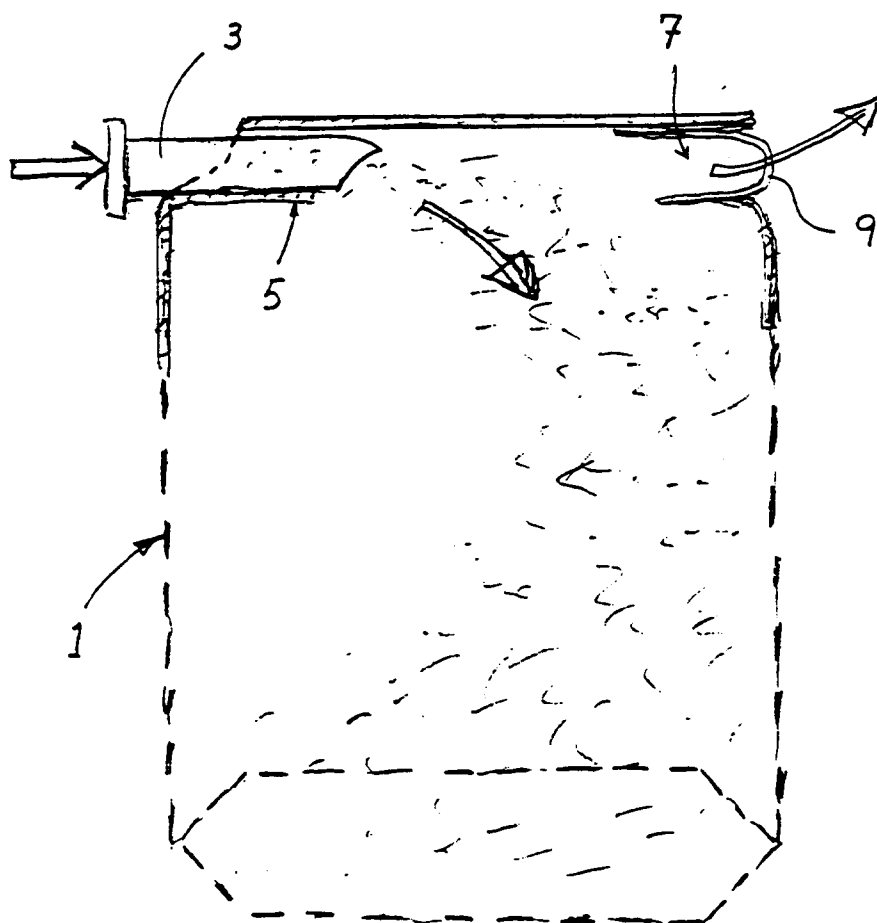


FIG. 2

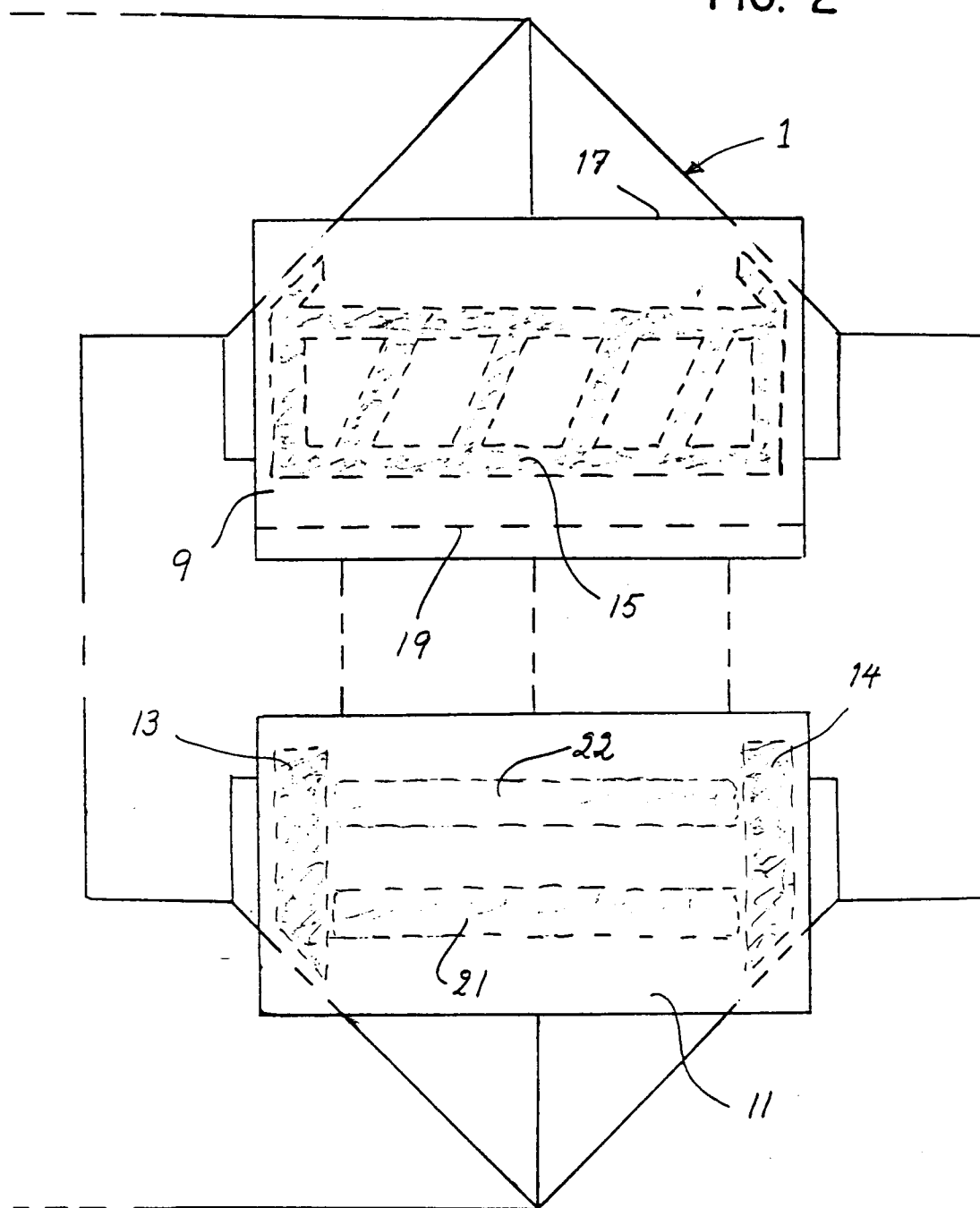


FIG. 3

