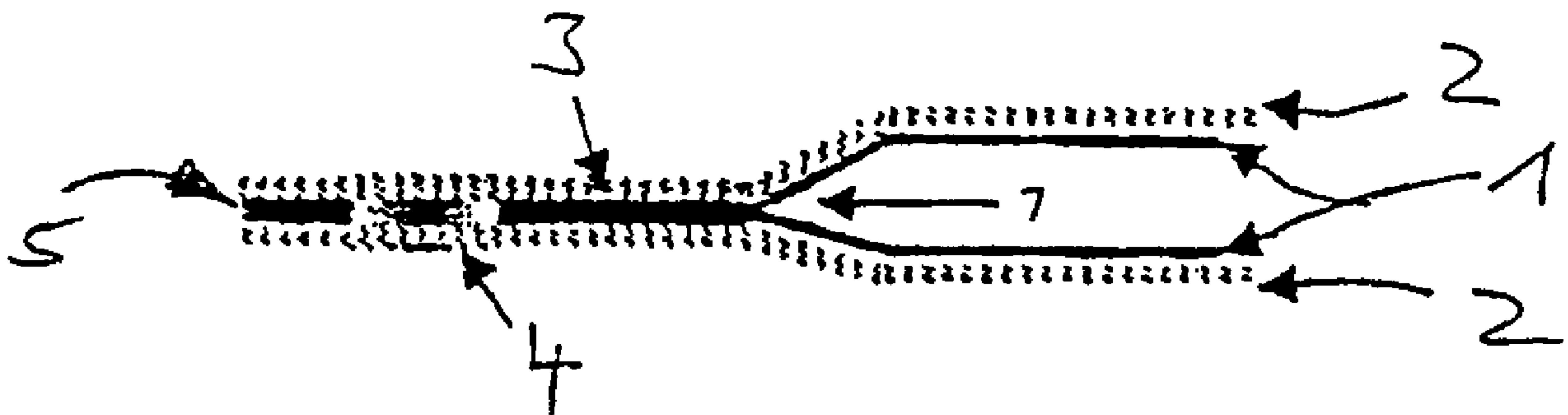




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(54) Title: AIR BAG



(57) Abrégé/Abstract:

The invention relates to a method for the production of a airbag, more particularly a one-piece woven (OPW) airbag, comprising single layer and double layer areas (3, 1) (3, 1), a top and bottom outer surface and a coating (2) in at least certain areas. The invention is characterized in that the single layer area (3) are sealed in such a way that said areas are substantially impermeable to fluids.



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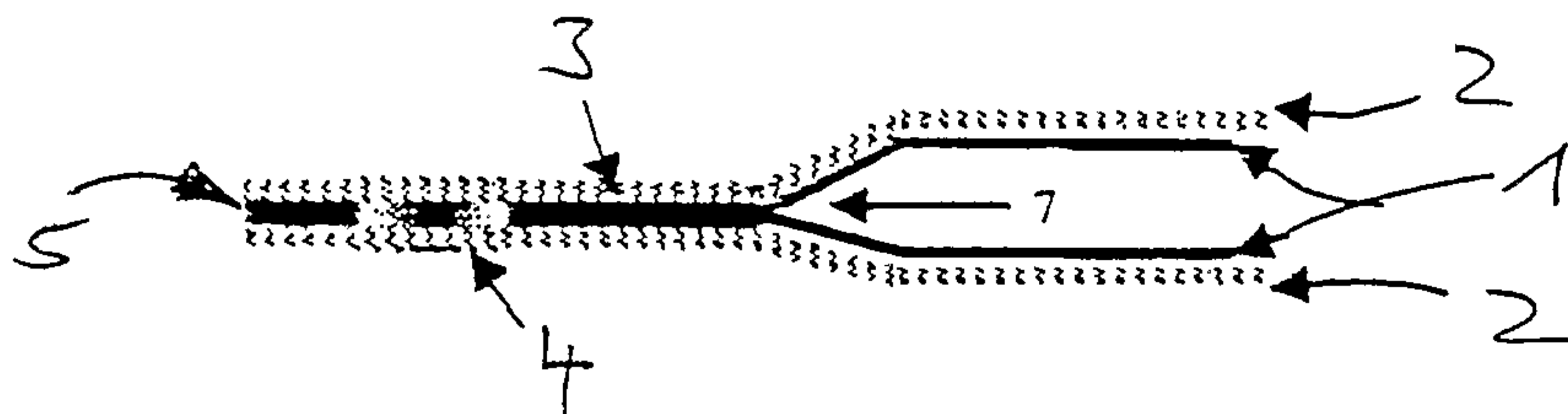
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Zur Erklärung der Zweibuchstaben-Codes und der anderen Ab-
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(54) Title: METHOD FOR PRODUCING AN AIRBAG

(54) Bezeichnung: VERFAHREN ZUR HERSTELLUNG EINES LUFTSACKS



area (3) are sealed in such a way that said areas are substantially impermeable to fluids.

(57) Abstract: The invention
relates to a method for the
production of a airbag, more
particularly a one-piece woven
(OPW) airbag, comprising single
layer and double layer areas (3,
1) (3, 1), a top and bottom outer
surface and a coating (2) in at least
certain areas. The invention is
characterized in that the single layer(57) Zusammenfassung: Es wird ein Verfahren zur Herstellung eines, insbesondere in einem Stück gewebten (OPW) Luftsacks
mit einlagigen und zweilagigen Bereichen (3, 1), mit einer oberen und einer unteren äusseren Oberfläche, mit einer wenigstens
bereichsweise aufgetragenen Auflage (2) vorgeschlagen, das dadurch gekennzeichnet, dass einlagige Bereiche (3) derart abgedichtet
werden, dass sie für Fluide im wesentlichen impermeabel sind.

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Air Bag

The present invention relates to a method for producing a, particularly one-piece woven (OPW) air bag having single-layer and two-layer portions, an upper and lower outer surface and at least one coating applied portionally.

One-piece woven (OPW) air bags are known, comprising one or more portions whose outer upper and lower surface is coated, for example with a film. The film serves the purpose of preventing escape of a fluid or gas from the chamber formed in the multi-layer portion between the layers. Although the applied coatings are practically completely impermeable, the air bags as described above are not sufficiently fluid-tight. Because of this, the useful life of air bags, particularly of side and head air bags as demanded by industry, is difficult to attain or only by highly expensive generators which recharge the escaped gas in several stages or compensated by an added amount of propellant to equalize the gas loss. Apart from this the air bags as just described have the drawback that gas leakages can gain access to the interior of the vehicle making use of such an air bag possibly a health problem, due to the gas as such or its high temperature.

The invention is based on the object of proposing a method for producing an air bag which avoids or at least greatly diminishes the drawbacks of prior art.

According to a first broad aspect of the present invention, there is provided a one-piece woven air bag having single-layer and two-layer portions, first and second outer surfaces thereof and a coating applied at least to portions of the first and second outer surfaces, wherein the single-layer portions are sealed in their fabric plane such that the single layer portions are substantially impermeable to fluids, the single-layer portions being provided in part with denser fabric structure portions to thereby form a fabric structure for the single-layer portions which is wovingly less dense in the remaining fabric thereof as compared to the denser fabric structure portions, wherein the coating penetrates deeper into the fabric on the less dense fabric of the first and second outer surfaces as compared to the denser fabric structure portions, and wherein the coatings are applied so deeply in the less dense fabric that the coatings meet in contact in the interior of the single-layer portions to thereby provide sealing in their said fabric plane.

- 1a -

It has been surprisingly discovered that leakage of air bags is caused by a gas permeability of the single-layer fabric edging the air bag in a seam-like connection. What happens here is that the gas escapes from the chambers of the air bag through the single-layer, i.e. in the plane of the fabric located between the coatings of the upper and lower outer surface. The problem forming the basis of the invention is optimally solved by sealing the single-layer portion so that it is impermeable to fluids.

In one advantageous aspect of the invention the single-layer portions are provided at least in part with a fabric structure which is wovingly less dense than the remaining fabric. This now makes it possible for an applied coating, for example a film or laminate to penetrate deeper into the less densely woven fabric of the single-layer portion, and possible so deeply that the coatings come into contact in the interior of the single-layer portion in thus forming a "horizontal" closure

which seals the single-layer portion of the fabric plane. This now makes it practically impossible for inflation gas to escape from the chambers formed by the two-layer portion.

A similar advantage is featured by another aspect of the invention wherein a low-viscosity coating is applied. This, similar to the method as just described, permits very deep penetration of the coating into the fabric in the single-layer portion in thus achieving complete sealing with the advantages as just described above.

A likewise advantageous aspect of the invention materializes from a method as it reads from claim 4 in which the single-layer portion is thermally sealed. Thus, in this case by heating the edging, fusion of the upper and lower coating is achieved at the outermost edging of an air bag, again resulting in a substantially complete closure or seal of the single-layer portion.

For a better understanding the invention will now be detailed by way of example with reference to a drawing in which

FIG. 1 is a greatly simplified diagrammatic view of a section through a prior art air bag with a single-layer portion adjoined by a two-layer portion, from which gas under pressure can escape.

FIG. 2 is a view similar to that of FIG. 1 showing a section of an air bag but with sealing as implemented by the method in accordance with the invention.

Referring now to FIG. 1 there is illustrated on the left a single-layer portion 3 which translates into a two-layer portion 1 in the middle of the FIG. Illustrated on both extreme outer surfaces in the two-layer portion 1 is a coating 2, for example in the form of an applied laminate or film which is intended to seal the fabric so tightly that no gas can escape via the surfaces of the air bag. In the example as shown in FIG. 1, however, the gas 7 under high pressure can drift through the single-layer fabric structure 3 in the plane of the fabric (to the left as shown in FIG. 1) and emerge at the location 5.

Referring now to FIG. 2 there is illustrated how the single-layer portion 3 features portionally a less denser structure 4 achieved, for example, by weaving. This less denser structure 4 makes it

possible for the coating 2 to penetrate deeper into the fabric as compared to the denser portions in the design. This can also be implemented in such a way that the two applied coatings come into contact in the middle of the fabric of the single-layer portion 3 with the less denser structure 4 in sealing this portion. This now prevents gas 7 under pressure from drifting through the single-layer portion 3 and emerging from the air bag at the location 5.

The same effect is achieved in accordance with the invention by making use of a low-viscosity coating capable of penetrating deeper into the single-layer fabric in creating a seal thereof.

By thermally sealing the single-layer portion, for instance at the location 5 as shown in FIGS. 1 and 2, whereby the coatings 2 of the upper and lower fabric layer are interconnected, sealing the single-layer portion is likewise possible in achieving an optimum seal of the air bag.

Implementing the method in accordance with the invention achieves a substantial better air bag, ensuring a substantially higher seal. This now makes it possible to very easily attain the specified long useful life, since the amount of gas having escaped by leakage is substantially reduced.

CLAIMS

1. A one-piece woven air bag having single-layer and two-layer portions, first and second outer surfaces thereof and a coating applied at least to portions of the first and second outer surfaces, wherein the single-layer portions are sealed in their fabric plane such that the single layer portions are substantially impermeable to fluids, the single-layer portions being provided in part with denser fabric structure portions to thereby form a fabric structure for the single-layer portions which is wovingly less dense in the remaining fabric thereof as compared to the denser fabric structure portions, wherein the coating penetrates deeper into the fabric on the less dense fabric of the first and second outer surfaces as compared to the denser fabric structure portions, and wherein the coatings are applied so deeply in the less dense fabric that the coatings meet in contact in the interior of the single-layer portions to thereby provide sealing in their said fabric plane.
2. The air bag as set forth in claim 1, wherein the coatings are low-viscosity coatings.
3. The air bag as set forth in claim 1 or 2, wherein the single-layer portions are thermally sealed.

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Prior Art

Fig. 1

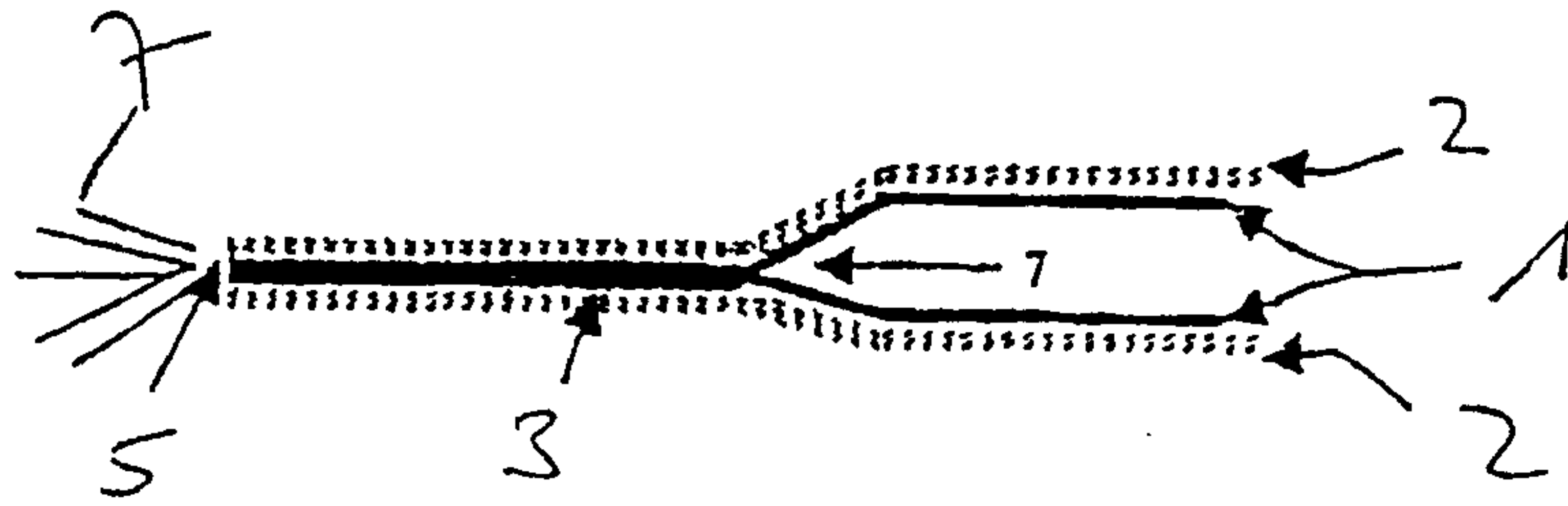


Fig. 2

