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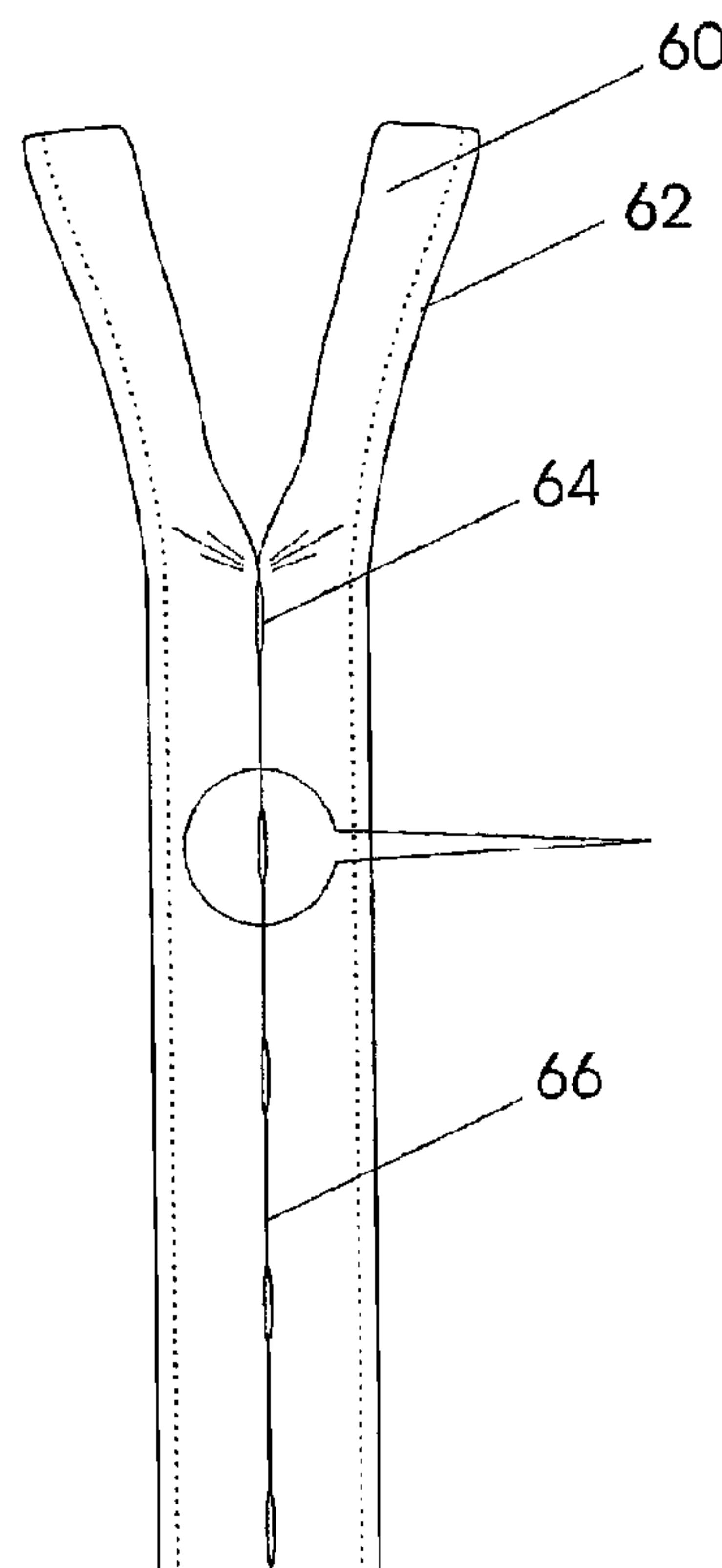
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(54) Titre : GLISSIERE DE FERMETURE-ECLAIR A MEMBRANE AMELIOREE POUR EMBALLAGES SOUPLES

(54) Title: ZIPPER SLIDER WITH IMPROVED DIAPHRAGM FOR FLEXIBLE PACKAGES



(57) Abrégé/Abstract:

The present invention relates an improved slider zipper assembly with a diaphragm for flexible packages comprising: - zipper profile consisting of male element and a female element, - said profile having flaps on single side, - said male element having at least a pair of notches, which could be coupled to corresponding notches on female elements, - a slider to close said zipper profile, and - a diaphragm of at least one metallized laminated film sealed between said flaps to seal and make the package tamper proof and act as a barrier characterized in that the diaphragm having a score line effected using means for scribing for making it easier and more convenient for the user to tear open and access the contents of the package.

## ABSTRACT

The present invention relates an improved slider zipper assembly with a  
5 diaphragm for flexible packages comprising:

- zipper profile consisting of male element and a female element,
- said profile having flaps on single side,
- said male element having at least a pair of notches, which could be coupled to corresponding notches on female elements,
- 10 - a slider to close said zipper profile, and
- a diaphragm of at least one metallized laminated film sealed between said flaps to seal and make the package tamper proof and act as a barrier

**characterized in that** the diaphragm having a score line effected using means  
15 for scribing for making it easier and more convenient for the user to tear open and access the contents of the package.

## **ZIPPER SLIDER WITH IMPROVED DIAPHRAGM FOR FLEXIBLE PACKAGES**

### **5   Background of the invention**

This invention relates to an improved zipper slider assembly with a diaphragm for flexible packages.

### **10   Background of the invention**

The subject matter of this patent application is an improvement over the zipper slider assembly with a diaphragm for flexible packages described in our co-pending Canadian patent application No 2437269 dated 12<sup>th</sup> August 2003.

15   Although the diaphragm described in the said co-pending patent application has strong barrier properties and also provides a tamper evident feature, it is difficult for the end user to tear open the diaphragm to access the contents of the flexible package.

20   As shown in Figure 1 of our co-pending patent application, the slider zipper assembly consists of a male member 20 having interlocking element 22 and flap 24. A female member 26 having interlocking element 28, a flap 30 and rectangular shaped protrusion 32 extending from said flap 30. A slider 34 is shown in the figure for closing and opening the zipper profile. A metallized  
25   diaphragm 36 is sealed between flaps 24, 30 by ultrasonic or heat sealing device.

Conventional diaphragms such as those shown in Figure 2A are co-extruded with the slider and are of the same material as that of the slider. Such a  
30   diaphragm 40 is described in US patent 6499878 and is integral with the zipper

42. The diaphragm is given a strong crease 41 such that on pulling the ends of the slider away from each other the diaphragm tends to stretch and tear along the crease. This stretching and subsequent tearing of the diaphragm is illustrated in Figure 2B. The diaphragm 40 does not provide convenience in tearing and often results in the diaphragm opening with a jerk such that the contents thereof are spilled.

One of the conventional approaches used to overcome the aforementioned drawback involves perforating the diaphragm for making it easier to tear open as illustrated in Figures 3A and 3B. During manufacturing, the zipper 52 and its diaphragm 50 are co-extruded as one piece. A strong crease 54 is formed. At regular intervals along the crease the diaphragm is provided with holes 56 such that the diaphragm has an easy tear line along the crease. Such a diaphragm provides for ease in tearing but does not provide adequate barrier properties as shown in Figure 3B. Such a perforation compromises the barrier property of the diaphragm and hence, of the flexible package. Therefore, it is not fit in cases where the barrier is an essential requirement for storing the contents in the flexible package.

One of the advantages of the metallized diaphragm, as provided by the present invention, is that the diaphragm has the same barrier properties as the body of the flexible package. In prior art packages, even when the body of the package had strong barrier protection, the weak barrier provided by the tamper evident structures such as peel seal used to allow moisture, micro-organisms, undesired aroma and the like to enter into the package. However, the diaphragm 36 has the same strong barrier properties as the body of the package itself that provides better protection to the packed contents during storage and transportation.

The object of this invention is to overcome the above-mentioned drawbacks and provide a zipper slider assembly with diaphragm having a score line for flexible packages that is more convenient for the user to tear open to access the contents of the package and at the same time possesses strong barrier properties for maintaining the desired aroma and freshness of food and other articles packaged inside the flexible package during transportation and storage till such time that they reach the end user.

Another object of this invention is to provide a tamper proof zipper slider assembly for flexible packages.

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To achieve the said objectives, this invention provides an improved slider zipper assembly with a diaphragm for flexible packages comprising:

- zipper profile consisting of male element and a female element,
- said profile having a first flap extending from said male element and a second flap extending from said female element;
- said male element having at least a pair of notches, which could be coupled to corresponding notches on female elements,
- a slider to close said zipper profile, and
- a diaphragm of at least one film sealed between said flaps to seal and make the package tamper proof and act as a barrier

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**characterized in that** the diaphragm has a score line using means for scribing for making it easier and more convenient for the user to tear open and access the contents of the package.

25 The means for scribing include lasers and water jet technology.

The film is made up of a plastic film or a laminate of at least two films laminated together.

The film is metalized, holographed, printed or plain.

The laminate of films includes at least one layer of aluminum foil.

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**Brief description of the accompanying drawings**

The invention will now be described with reference to the accompanying drawings.

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Figure 1 illustrates a slider zipper assembly with a diaphragm described in our copending Canadian application 2437269.

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Figure 2A illustrates a diaphragm of US patent 6499878 and Figure 2B shows in an fragmentary view a portion of the diaphragm shown in Figure 2A.

Figures 3A illustrates a diaphragm of the prior art with an easy tear line and Figure 3B shows in an fragmentary view a portion of the diaphragm shown in Figure 3A.

20

Figures 4A shows the improved diaphragm with a score line according to the present invention and Figure 4B shows in an fragmentary view a portion of the diaphragm shown in Figure 4A.

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Figure 5 illustrates a flexible package employing the improved diaphragm in accordance with this invention.

**Detailed description of the accompanying drawings**

Figure 4 shows the improved metallized diaphragm 60 with a score line 66 according to the present invention. The diaphragm is press sealed between flaps 62 of the male and female profile of the zipper. The score line has minute holes 64 at regular intervals. However, these holes do not completely penetrate the  
5 diaphragm as illustrated in Figure 4B.

Figure 5 illustrates a flexible package employing the improved diaphragm in accordance with the invention. In the figure, the male element 70 and the female element 72 of the zipper assembly are shown along with the diaphragm 60. The  
10 score line is effected by means for scribing for easier opening of the diaphragm to gain access to the contents of the flexible bag. In a preferred embodiment as shown in Figure 3, the scribing means is a laser for cutting the diaphragm without compromising its strong barrier properties.

15 The laminate shown in this embodiment comprises three layers: the outer two layers (80, 84) being polymeric and the center layer (82) being a metalized polymeric for providing the strong barrier property. The score line in this case is applied partially such that the depth of the score line is limited only up to metalized structure of the laminate, leaving metalized layer intact and thereby  
20 maintaining the strong barrier of the laminate. With such a score line cut in place, user can more easily open the bag by tearing along the score line on the diaphragm.

In another embodiment, the laminate may comprise of an aluminum foil in  
25 between two layers of polymeric films or even a combination of a metalized layer and an aluminum foil may also be used to provide an even stronger barrier. In such an embodiment also the partial laser cut is such that the depth of cut is limited only up to the aluminum foil or a combination of the metalized

layer and aluminum foil of the laminate as the case may be and thereby maintaining the strong barrier of the laminate.

It may be observed that the laminates used in the above embodiments have been  
5 described using only three layers for the ease of illustration and is in no way a limitation of the present invention. A man skilled in the art will appreciate that number of layers and their composition in a laminate may vary as per the requirements of different flexible packages.

**I claim:**

1. A zipper assembly for a flexible package, said zipper assembly comprising:
  - a zipper profile including a male element and a female element,
  - said profile having a first flap extending from said male element and a second flap extending from said female element,
  - said male and female elements each having a corresponding interlocking element provided thereon for releasably coupling said male element to said female element; and
  - a diaphragm having a first layer and a metalized second layer laminated to said first layer, said diaphragm being formed separately from said first and second flaps, said diaphragm being sealed to oppositely directed external faces of said first and second flaps, and being wrapped around distal edges of said first and second flaps to seal the package and act as a barrier, said first layer having a score line extending through said first layer upto said second layer.
2. The zipper assembly as claimed in claim 1 wherein the score line is effected by scribing means, said scribing means including lasers and water jet technology.
3. The zipper assembly as claimed in claim 1 wherein the diaphragm includes at least one of a plastic film or a laminate of at least two films laminated together.
4. The zipper assembly as claimed in claim 1 wherein the diaphragm is metalized, holographed, printed or plain.

5. The zipper assembly as claimed in claim 1 wherein the diaphragm includes at least one layer of aluminum foil.
6. The zipper assembly of any one of claims 1 to 5, further comprising a slider to close said zipper assembly.
7. A flexible package comprising a pouch with an opening, said opening including a releasable closure means wherein said closure means comprises the zipper assembly of any one of claims 1 to 6.

Application number/numéro de demande: 2474944

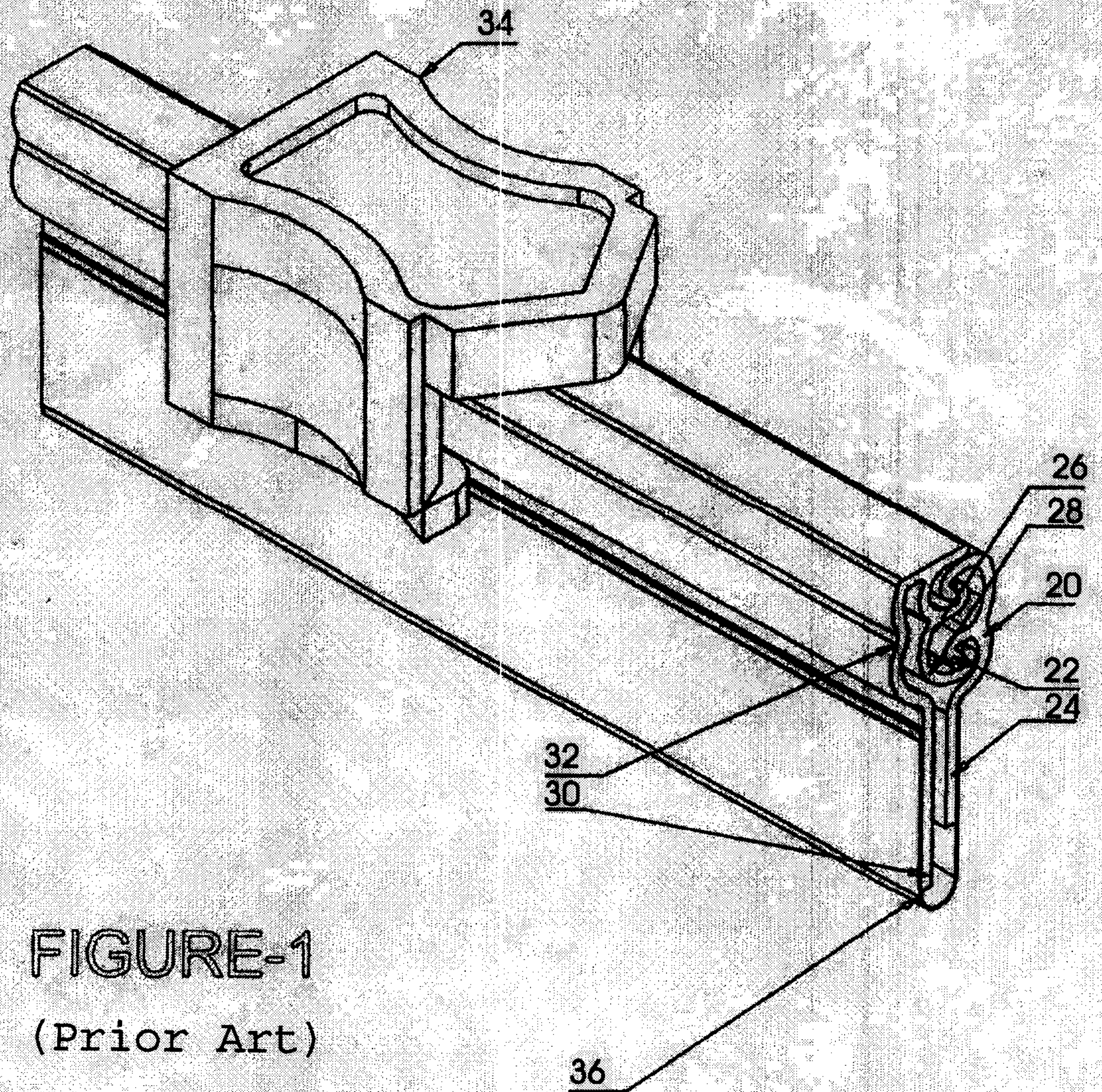
Figures: 1, 5

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Drawings

Unscannable items  
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Documents reçus avec cette demande ne pouvant être balayés  
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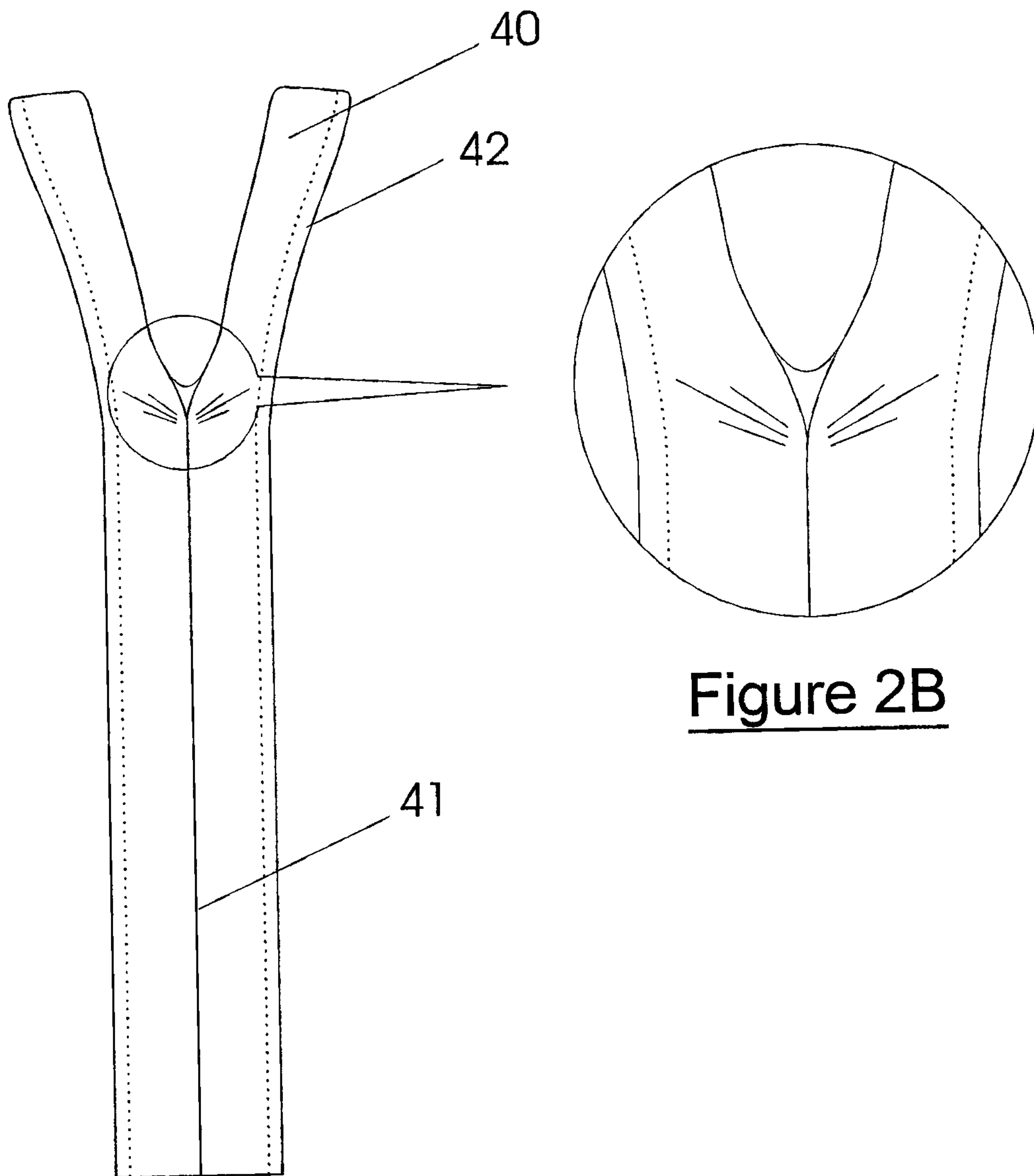


Figure 2B

Figure 2A  
(Prior Art)

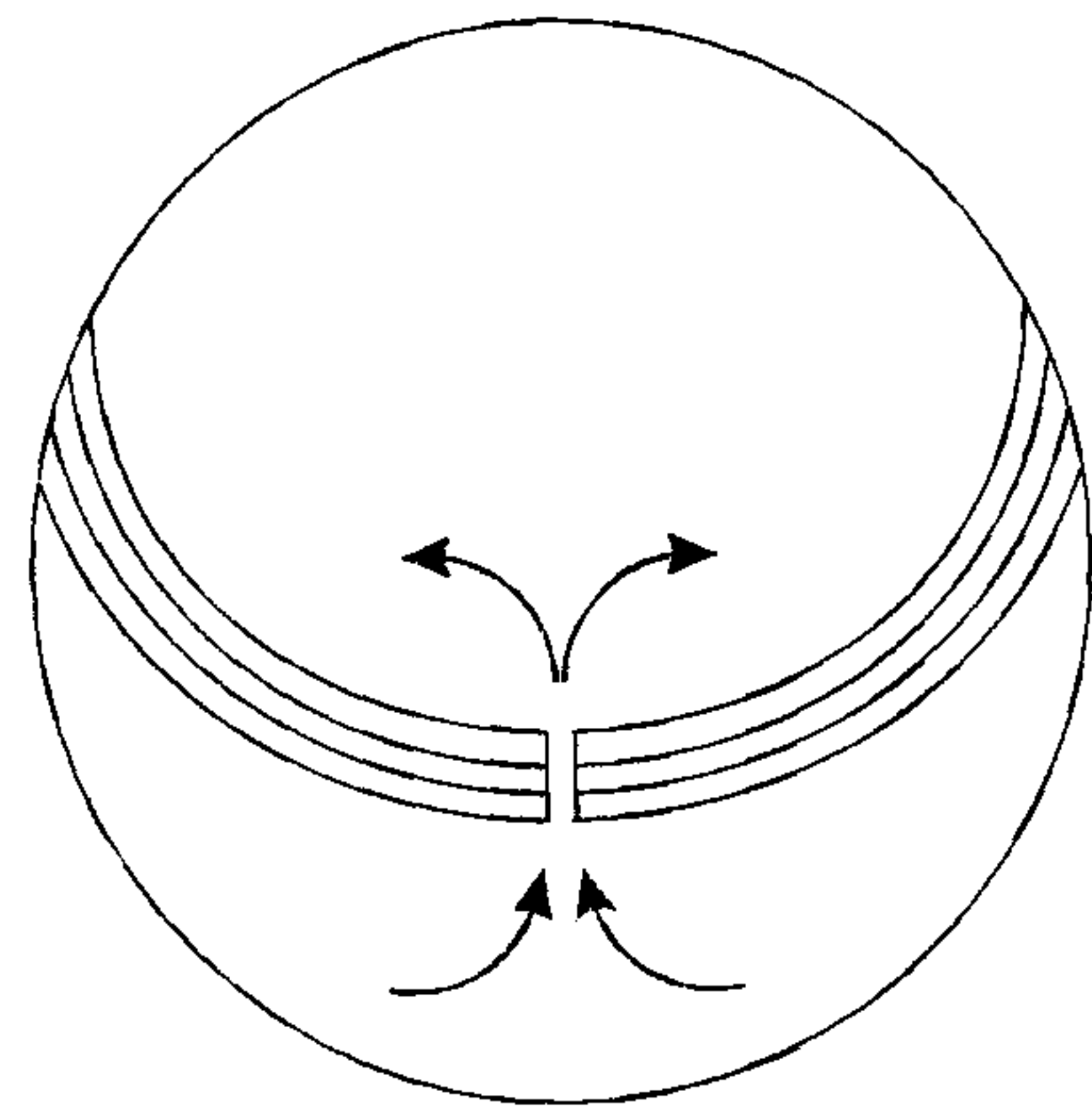
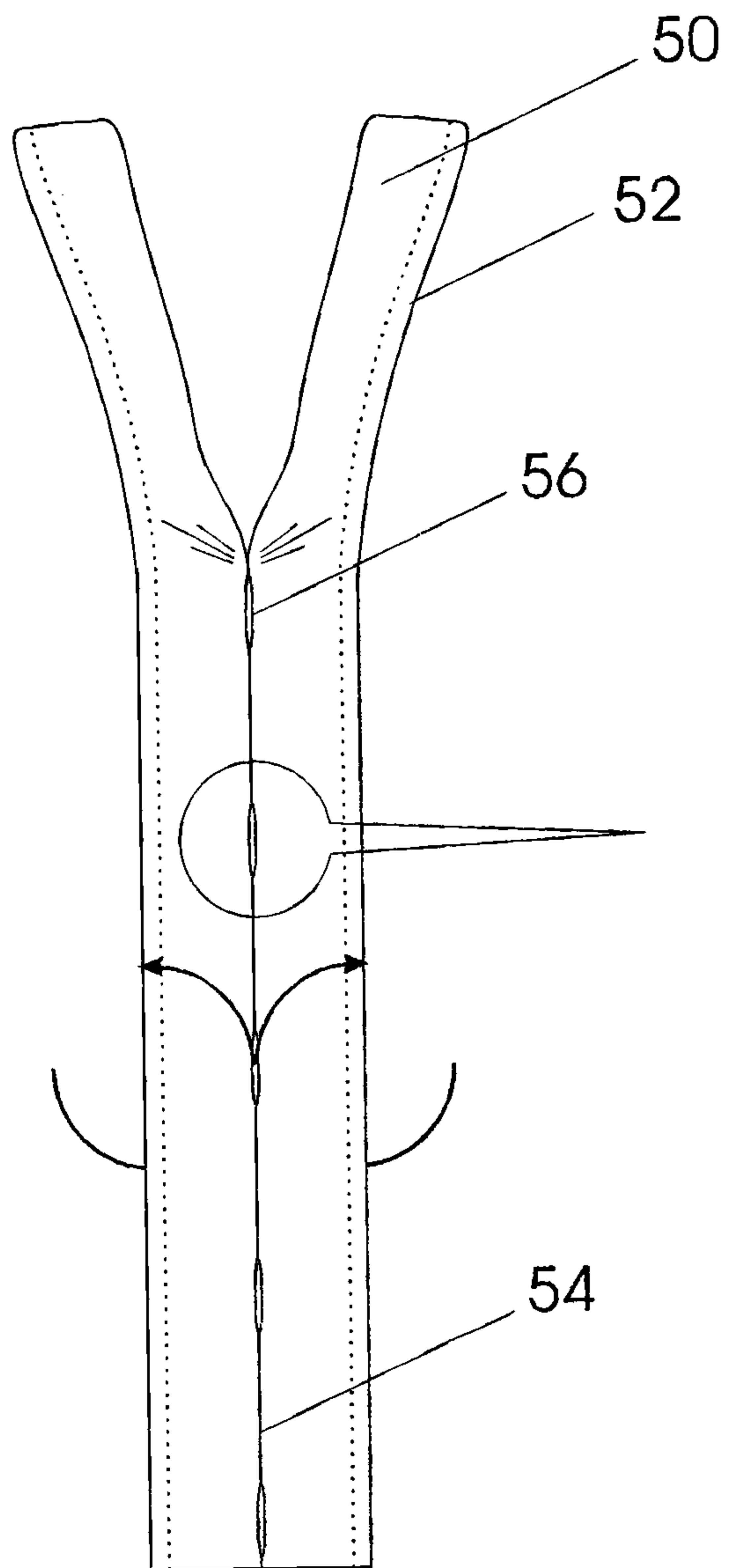


Figure 3B

Figure 3A

(Prior Art)

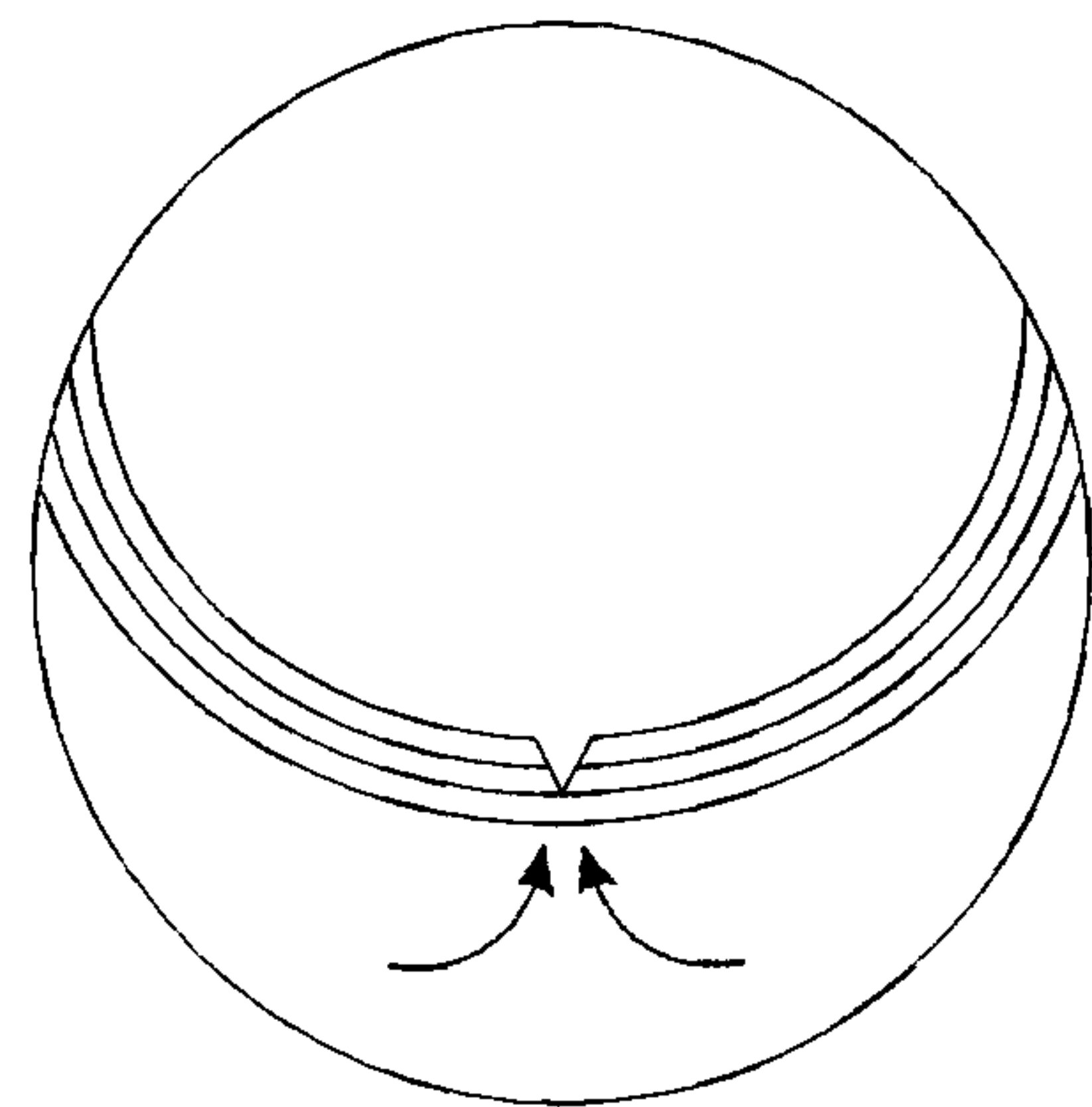
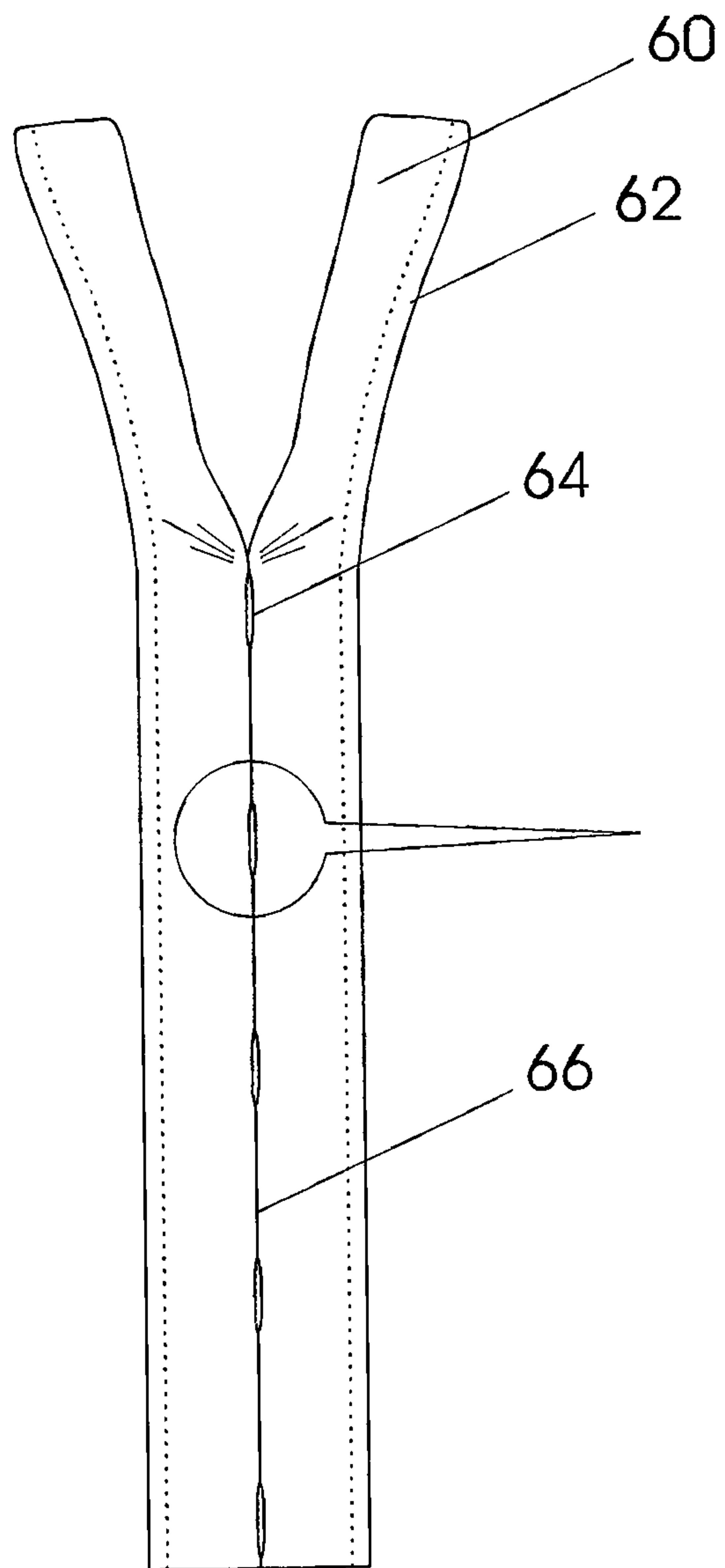


Figure 4B

Figure 4A

