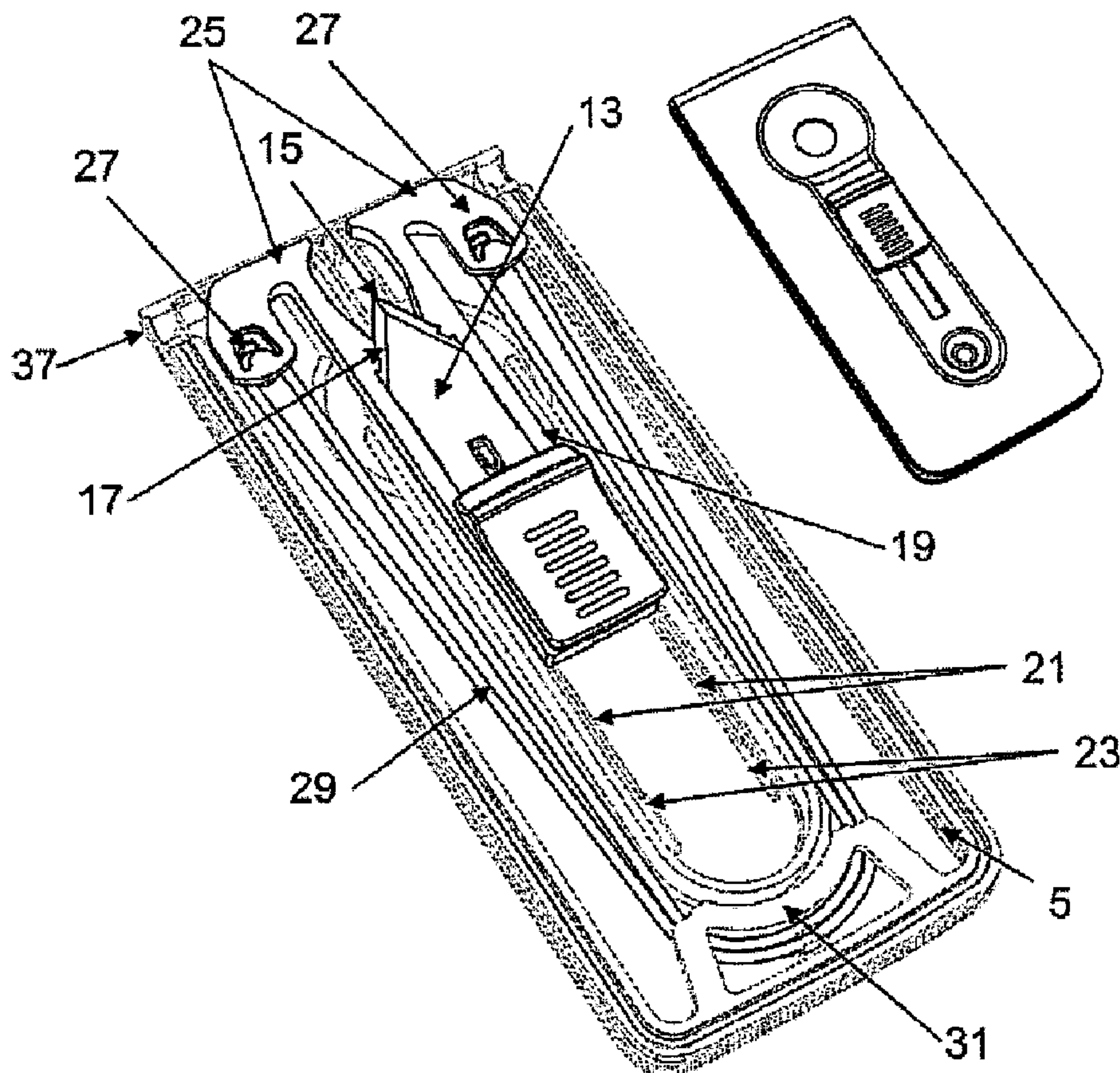




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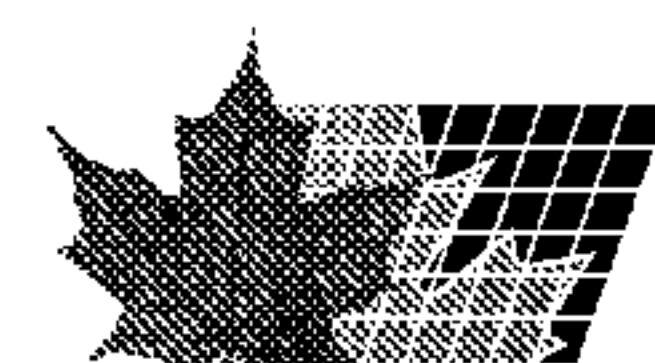
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(54) Titre : DISPOSITIF POUR COUPER DES ARTICLES DE TABAC
(54) Title: DEVICE FOR CUTTING TOBACCO ARTICLES



(57) Abrégé/Abstract:

The invention relates to a device for cutting strand-shaped tobacco articles, comprising a housing (1) with an inlet orifice (7) for a strand-shaped tobacco article and a blade (13) mounted so as to be displaceable in the housing, the cutting edge of which can be



(57) **Abrégé(suite)/Abstract(continued):**

pushed through the inlet orifice (7) in order to cut a tobacco strand introduced into it, and the blade (13) has a tip (15) which is directed essentially centrally towards the inlet orifice (7). It further relates to a tobacco article cutting device with a separate cut ends-shaping contour (25, 33), which shapes the end of the article to be cut and is activated as the blade (13) is displaced during the cutting process.

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Applicant: British American Tobacco (Germany) GmbH

Abstract

The invention relates to a device for cutting strand-shaped tobacco articles, comprising a housing (1) with an inlet orifice (7) for a strand-shaped tobacco article and a blade (13) mounted so as to be displaceable in the housing, the cutting edge of which can be pushed through the inlet orifice (7) in order to cut a tobacco strand introduced into it, and the blade (13) has a tip (15) which is directed essentially centrally towards the inlet orifice (7). It further relates to a tobacco article cutting device with a separate cut ends-shaping contour (25, 33), which shapes the end of the article to be cut and is activated as the blade (13) is displaced during the cutting process.

(Fig. 2)

Device for cutting tobacco articles

The invention relates to a device for cutting strand-shaped tobacco articles, in particular tobacco articles for self-rolling cigarettes. On the basis of one special variant of its use, the device proposed by the invention is intended for use with prefabricated, in particular encased, tobacco strands which are to be divided portions for consumption and transferred to cigarette sleeves.

In addition to numerous types of cutting devices for cigars and cigarillos, cutting devices are also known which are designed to address the problems involved in cutting smoking articles which have a more sensitive, in particular more deformable casing than cigars.

German patent specification DE 44 06 006 A1 filed on February 24, 1994 discloses a device for cutting tobacco strands. The device is designed to enable a cleaner cutting operation without crushing the tobacco strands to be cut. To this end, at least one blade is moved relative to the tobacco strand as the cut is made by holder. The specific objective of this application is to compress the cut ends as little as possible.

Canadian patent specification CA 2,124,510 filed on May 27, 1994 describes a device for cutting cigarettes. The objective of the device is to cut cigarettes with a clean cut, without compressing the cut ends. To this end, the device uses a cutting system comprising two blades, which are moved towards one another by a shearing movement and thus cut off the cigarette. The two blades are mounted on a fork-type mechanism, which is operated directly by the consumer.

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German patent specifications DE 43 39 037 A1, DE 43 39 038 C2 and DE 43 39 039 C2 filed on November 16, 1993 disclose devices which are used to cut bar-shaped smoking articles. The intention is primarily to cut excessively long smoking articles, and a specific frustoconical shape is simultaneously produced at both cut ends by the angled cutting edge of the two cutting blades in order to make it easier to introduce the smoking article portions into the cigarette sleeve on the one hand and simultaneously to reduce the amount falling out at the end of the smoking article portion on the open cigarette sleeve. To this end, guillotine-type mechanisms are used or alternatively devices of the pliers or scissors type, each with two blades. A rounded, U-shaped contour is preferably selected for the blade shape.

German patent specification DE 44 14 607 A1 filed on April 27, 1994 discloses a cigarette cutter, which is able to cut off a cigarette with a moving blade. To this end, a U-shaped opening is provided, in which the cigarette can be positioned. By operating a slide, the blade is moved downwards and the cigarette, which is burning in particular, is severed. The blade in this instance has a single cutter in all embodiments and is chamfered so that the cigarette is pushed into the rounding of the U-shaped opening during the cutting process.

A device with a very similar cutting mechanism is described in German patent specification DE 572673 patented on June 3, 1931. However, the essential difference is that one or two circular inlets of differing diameters for cigars are provided, which can be used alternately.

German patent specification DE 36 21 399 C2 filed on June 26, 1986 discloses a device, which is intended to improve a known cigar cutter. In this instance, a blade holder is retained in a grip body comprising two shells. The blade holder can be folded out in a manner similar to that of a standard pocket knife, thereby exposing a transverse orifice in the grip body. The object to be cut can then be introduced into this transverse orifice and the object, in particular the cigar, is cut by folding the blade holder back in.

The devices known from the prior art and described above are often difficult to operate or of a complicated design, especially if several blades are used. The

proposals involve either shaping both sides of the tobacco strand at the cutting point or avoiding such shaping altogether. Although shaping the two sides makes it easier to introduce a tobacco strand into a sleeve, it also results in an aesthetically unpleasant appearance of the free cigarette end. On the other hand, totally dispensing with shaping makes it very difficult to introduce the tobacco strand into a cigarette sleeve. In addition, the shaping parts of the devices described in the prior art have disadvantages in terms of the way the actual cut is made and a compromise always has to be struck between making the cut and shaping.

The objective of this invention is to propose a device for cutting strand-shaped tobacco articles, which overcomes at least some of the disadvantages outlined above. In particular, the objective of some embodiments is to produce an optimal cut with advantageously shaped cut surfaces.

A device for cutting strand-shaped tobacco articles is proposed by the invention, comprising a housing with an inlet orifice for a strand-shaped tobacco article, and with a blade mounted in the housing so as to be displaceable, the cutting edge of which can be pushed through the inlet orifice in order to cut a tobacco strand inserted in it, and the blade has a tip which is directly essentially centrally towards the inlet orifice.

In other words, the blade of the device is no longer shaped so that it establishes a linear contact as or shortly after it hits the tobacco strand (as is the case with blades with straight or U-shaped cutting edges), and instead the blade initially makes a point contact and does so by means of the blade tip. As a result, the blade tip pierces and tears open the tobacco strand or, as is the case, its sleeve immediately on initial contact and the blade can easily continue cutting at the resultant edges of the tear hole without the force expended as a result changing the shape of the tobacco article at the cutting point. Where the expression "essentially at the centre" is used, this should be construed as meaning that the tip must not hit the tobacco strand exactly at the centre (in other words at the apex) but possibly more or less adjacent to it, provided it can be guaranteed that the tip

firstly produces the piercing effect and then permits the remainder of the cut at the edges. As a result of the design proposed by the invention, the cutting operation can be run easily and with little force, and in particular a single blade is sufficient to produce a good cut. The essentially round cross-section of the tobacco strand is preserved, in other words the tobacco article is not already deformed by the cutting process itself or by the opposing forces in the inlet orifice.

In a preferred embodiment of the device proposed by the invention, two cutting edges extend back from the tip on the blade, subtending an acute angle of 30° to 120° , in particular 50° to 90° , and more especially 60° to 80° . The cutting edges in one embodiment are at least ground from one flat face but may advantageously also be ground from both flat faces. In one special design, they are ground symmetrically from both flat faces in order to produce the cutting edge.

By virtue of another aspect of this invention, a device for cutting strand-shaped tobacco articles is proposed, comprising a housing with an inlet orifice for a strand-shaped tobacco article, and with a blade mounted in the housing so as to be displaceable, the cutting edge of which can be pushed through the inlet orifice in order to cut a tobacco strand inserted in it, and the device has a separate cut ends-shaping contour or cut ends-shaping structure which shapes the end of the tobacco article to be cut and is activated as the blade is displaced during the cutting process. A device of this design may naturally also incorporate the features outlined above.

During tests conducted on the systems known from the prior art with a view to shaping the tobacco strand during cutting, either the blade itself or the inlet orifice was contoured in order to produce specific shapes, whereas the advantages of the inventive device described above are based on the fact that the shaping device is provided separately and is activated as the blade is displaced during the cutting process. This offers a number of options in terms of the disposition of the shaping device, in other words the cut ends-shaping contour, which in turn results in an even greater number of options with regard to shaping, but allows the cut end to be left in its cut shape. It is no longer the contour of the actual blade or the contour of

the back-pressure portion in the inlet orifice which defines the shape of the cut tobacco article, but instead this end shape is defined by a separate cut ends-shaping contour. As a result, cutting and shaping are separate and the disadvantages which occur in the prior art requiring a compromise to be struck between the way the cut is made and shaping can be eliminated. In other words, the improved shape no longer has to be achieved at the "cost" of a poorer cut and vice versa.

In one embodiment of the device described above, the cut ends-shaping contour has a compressing structure in the region of the inlet orifice, which is pushed towards the inlet orifice and against the tobacco article to be cut as the blade is moved during the cutting process in order to engage it. This compressing contour may be of any shape, depending on the desired final shape of the end.

Within the scope of this invention, the cut ends-shaping contour and the blade may be retained in an elastic pull, in particular a rubber or spring pull, in an initial position in which they do not project into the inlet orifice. This ensures that the tobacco article can be introduced unobstructed.

In one embodiment, the cut ends-shaping contour has two arms, which form a tapering holder constituting a compressing structure in the region of the inlet orifice, which is moved towards the inlet orifice and against the tobacco article to be cut as the blade is moved during the cutting process.

In order to couple the displacement of the blade and activation of the cut ends-shaping contour, the device is specifically designed so that the blade or a component that is displaced with the blade pushes the cut ends-shaping contour into a position in which it shapes the cut ends.

In one embodiment of this invention, the shape imparting region or the compressing structure of the cut ends-shaping contour is disposed essentially on one side of the blade cutting plane so that the tobacco article is shaped or

compressed essentially on this side only. One particular advantage of this invention comes into play in this respect, associated with the many possible options for positioning the cutting ends-shaping contour mentioned above. If this contour acts on only one side of the blade, it is possible to shape one cut end and leave the other cut end without any shaping. What this means in terms of the resultant tobacco article parts is that they have an aesthetically appealing and non-shaped end face at the end that is only cut, as is the case with conventional cigarettes at the end which is lit, for example. Shaping takes place on the other side of the blade, and this end may be used to insert the tobacco article in a cigarette sleeve, for example, which is made much easier due to the compression. This means that tobacco articles can therefore be cut so that one end is always compressed and the other end is cut smooth.

In this respect, the invention offers another advantageous option whereby the cut ends-shaping contour or its compressing structure can be shaped in a desired design in the region where it engages with the tobacco part. This shape may be cylindrical for example, or may become wider away from the cutting plane, in particular may diverge in a cone shape. The invention offers yet another advantage in this respect in that it is only necessary to provide different cut ends-shaping contours with different compressing contours if it is desirable to impart some change as regards the compressing shape of a cigarette end.

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In one embodiment of this invention, there is device for cutting strand-shaped tobacco articles comprising: a housing with an inlet orifice for a strand-shaped tobacco article, and with a blade mounted so as to be displaceable in the housing, the cutting edge of which can be pushed through the inlet orifice in order to cut a tobacco strand introduced into it, and a separate cut ends-shaping contour which shapes the end of the tobacco article to be cut and is activated as the blade is displaced during the cutting process, wherein the blade or a component that is displaced with the blade pushes the cut end-shaping contour into a constituting position in which it shapes cut ends of the tobacco strand.

The invention will be described in more detail below with reference to an embodiment illustrated in the appended drawings. The described features may be used individually and in any expedient combination. Of the drawings:

Figure 1 shows a device proposed by the invention in three operating phases, viewed at an angle from above;

Figure 2 is a view of the device proposed by the invention from above, with the housing top part removed, and a corresponding view on a reduced scale, showing the operating phase of the device;

Figure 3 is a view of the device proposed by the invention from underneath, with the housing bottom part removed, and a corresponding diagram on a reduced scale, again showing the operating phase; and

Figure 4 is a longitudinal section through a device proposed by the invention along section plane A-A indicated in the diagram on a smaller scale on the left-hand side.

Figures 1a to 1c illustrate a device as designed by the invention in three control phases or operating phases. The device has a housing 1 with a housing top part 3 and a housing bottom part 5, and an inlet orifice 7 is disposed in the top region of the housing, which extends through both housing parts 3, 5 and is used for introducing the strand-shaped tobacco articles to be severed or cut. In the embodiment illustrated, the inlet orifice 7 is circular in shape and in particular, the diameter of the inlet orifice 7 may be slightly bigger than the diameter of a tobacco article to be cut. This guarantees good to optimum support during the cutting process around a major part of the circumference. To make the introduction process easier, a slight chamfer may be provided in the housing top part 3 around the inlet orifice 7.

Disposed underneath the inlet orifice 7 is a slide 9, which is guided in a groove 11. On the bottom face of the groove 11, an auxiliary tip former 35 may be seen, which is funnel-shaped.

When the slide 9 is moved upwards out of the one end position illustrated in Figure 1a and transferred to a middle position illustrated in Figure 1b, the blade 13 is visible in the inlet orifice 7. The blade 13 is designed so that the cutting forces act symmetrically on the tobacco strand in the direction of movement. To this end, it has a tip 15, as may also be seen from Figures 2 and 3, which lies on the central blade longitudinal axis in the embodiment illustrated and the movement of which is effected centrally through the inlet orifice 7. Running back from the tip 15, the blade

13 has two cutting edges 17, which may generally subtend an acute angle of 30° to 120° and in this instance subtend an acute angle of approximately 70°. The two edges are ground so as to be sharp on both sides of the tip and on the top and bottom face of the blade so that the blade 13 runs symmetrically to a point from both flat faces, as may be seen in particular from the diagram shown in section in Figure 4. A cutting geometry in conjunction with the supporting effect of the orifice size and geometry result in an optimum cutting operation. In state c illustrated in Figure 1, the slide 9 and the blade 13 have reached the top end position in which the orifice 7 is completely closed by the blade 13. The cutting edges 17 and the tip 13 can no longer be seen, which means that the cut has been fully terminated.

In Figure 2, the device is illustrated with the housing 1 open or more accurately with the housing top part 3 removed. The diagram shown on a smaller scale next to the open housing illustrates the device in the state of the operating phase shown in Figure 1c, where the slide and the blade have been moved fully upwards.

In this view, the blade 13 is now fully visible above the slide 9. The slide 9 and the blade 13 are mounted on a blade holder 19, which can in turn be displaced in a sliding movement in the guide 21. Provided at the bottom end of the guide 21 is a stop 23 for the blade holder 19, which restricts the movement of the blade holder 19 towards the bottom end of the housing illustrated in Figure 2. At the top end of the blade holder 19, the latter has two fork-type arms 25, which in turn have holders 27 for a rubber pull 29, the holders 27 being more clearly illustrated in Figure 3. The rubber pull 29 is joined via the holder 27 to the arms 25 and tensed at the bottom of the housing by means of a hanger 31 so that the blade holder 19 lies against the stop 23 in the bottom end position in the relaxed state.

However, the blade holder 19 with its arms 25 has another purpose, namely the shaping one of the cut ends of the tobacco article, and this function may be seen in Figure 3. Figure 3 again shows the open housing 1 but this time viewed from the bottom housing end with the housing bottom part 5 removed. The operating phase

is again identical to that shown in Figures 1c and 2 and the small diagram next to the open housing illustrates this from the rear face of the device.

As may be seen from the diagram shown in Figure 3, the blade lies underneath the holder 19. The arms 25 lying above the blade have a tapering cut-out in the region of the cutting edges 17, which results in a compressing contour 33. When the blade with the cutting edges 17 is pushed forward by the slide 9 (Figures 1a to 1c and 2), it takes the blade holder 19 with it in another narrower region underneath the compressing contour 33, and whilst the tobacco article is initially being pierced and then cut, it is shaped at the side by the compressing contour 33, which may be seen at the top in Figure 3. To this end, the compressing contour 33 is designed so that the front region of the cut tobacco article is conically or cylindrically compressed on this side, which enables this end face of the cut tobacco article to be easily introduced into a filter sleeve.

On the other side, namely on the side which may be seen at the top in Figure 2, the compressing structure 33 does not project beyond the top blade face and the tobacco strand therefore remains straight here and is cut without being compressed, resulting in a smooth terminal end with the aesthetically appealing shape of the lighting end of a cigarette, such as conventionally obtained with cigarettes produced by machine.

This design of the device proposed by the invention makes it possible to impart different shapes to the two cut surfaces at the severance plane. The centrally disposed blade tip produces a piercing action and a slight cut which does not change the shape at the cut end due to the cutting forces alone. Due to the design proposed by the invention, cutting and shaping are separate and better, as well as more reproducible than is the case using the technologies known from the prior art, which usually employ faceted cutting surfaces.

In Figures 2 and 3, other orifices are provided at the top corners of the housing, which serve as knocking out orifices 37 for removing any tobacco particles which might have accumulated in the housing.

Figure 4 shows a section through the top part of the device proposed by the invention illustrated in Figures 1, 2 and 3, illustrating how the device elements described above lie one above the other. The section plane A-A may be seen in the smaller diagram shown on the left.

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CLAIMS:

1. Device for cutting strand-shaped tobacco articles comprising:

5 a housing with an inlet orifice for a strand-shaped tobacco article, and with a blade mounted so as to be displaceable in the housing, the cutting edge of which can be pushed through the inlet orifice in order to cut a tobacco strand introduced into it, and

10 a separate cut ends-shaping contour which shapes the end of the tobacco article to be cut and is activated as the blade is displaced during the cutting process, wherein the blade or a component that is displaced with the blade pushes the cut end-shaping contour into a constituting position in which it shapes cut ends of the tobacco strand.

15 2. Device as claimed in claim 1, wherein two cutting edges are disposed on the blade running back from the tip, which subtend a tip angle of 30° to 120°.

3. Device as claimed in claim 1 or 2, wherein two cutting edges are disposed on the blade, which are ground at
20 least from one flat face.

4. Device as claimed in claim 1, wherein the cut ends-shaping contour has a compressing structure in the region of the inlet orifice, which is moved towards the inlet orifice and pushed against the tobacco article to be
25 cut in order to engage it as the blade is displaced during the cutting process.

5. Device as claimed in any one of claims 1 to 4, wherein the cut ends-shaping contour and the blade can be held in an initial position by means of an elastic pull in
30 which it does not project into the inlet orifice.

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6. Device as claimed in any one of claims 1 to 5,
wherein the cut ends-shaping contour has two arms which form
a tapering holder disposed in the region of the inlet
orifice constituting a compressing structure, which is
5 pushed towards the inlet orifice and placed against the
tobacco article to be cut as the blade is displaced during
the cutting process.

7. Device as claimed in any one of claims 1 to 6,
wherein the blade or a component that is pushed with the
10 blade pushes the cut ends-shaping contour into a position in
which it shapes the cut end during the cutting process.

8. Device as claimed in any one of claims 1 to 7,
wherein the cut ends-shaping contour has a shaping region or
compressing structure which lies on one side of a cutting
15 plane formed by movement of the blade so that the tobacco
article is shaped and compressed on this side only.

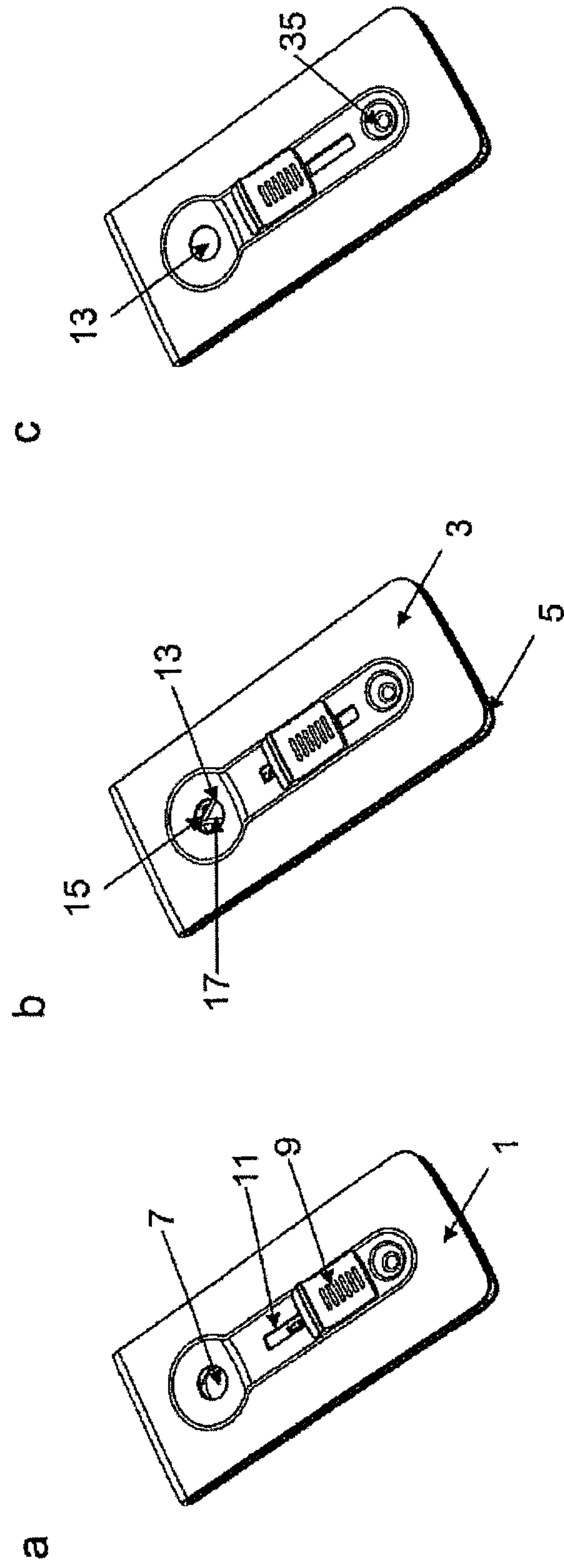
9. Device as claimed in any one of claims 1 to 8,
wherein the cut ends-shaping contour or a compressing
structure of the cut ends-shaping contour widens
20 cylindrically or away from a cutting plane formed by
movement of the blade, in the region where it engages with
the tobacco article.

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PATENT AGENTS

Fig. 1



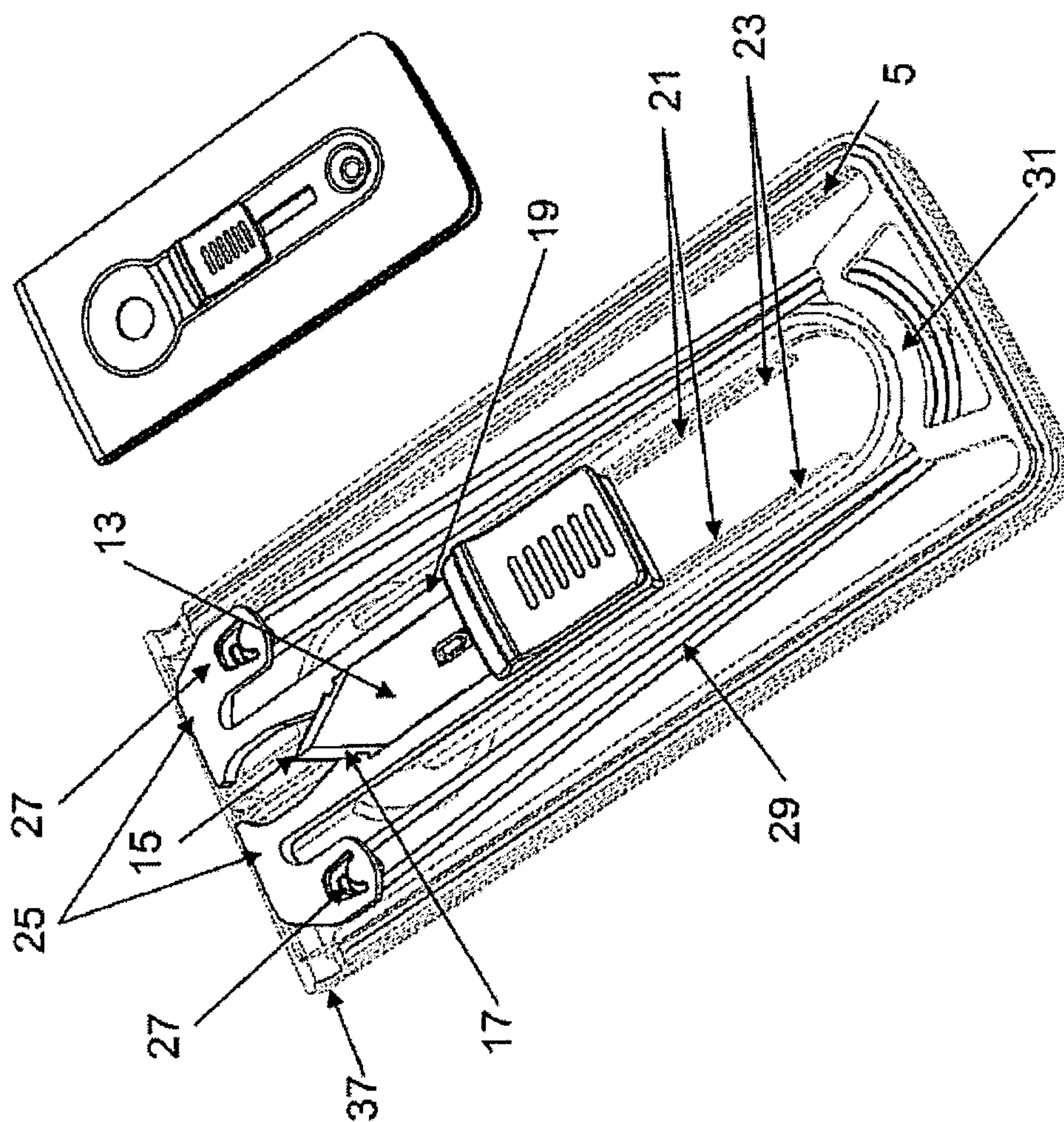


Fig. 2

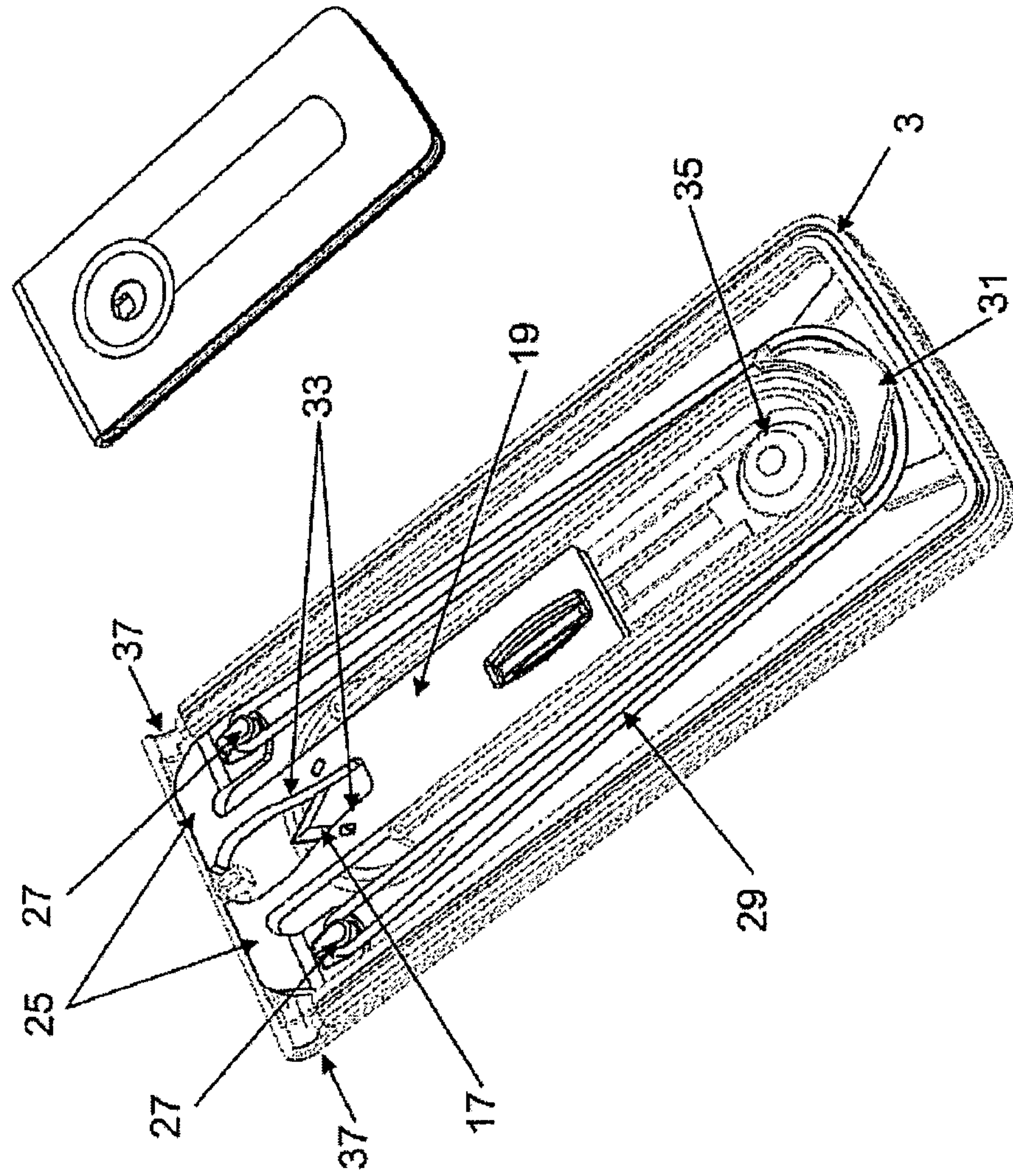


Fig. 3

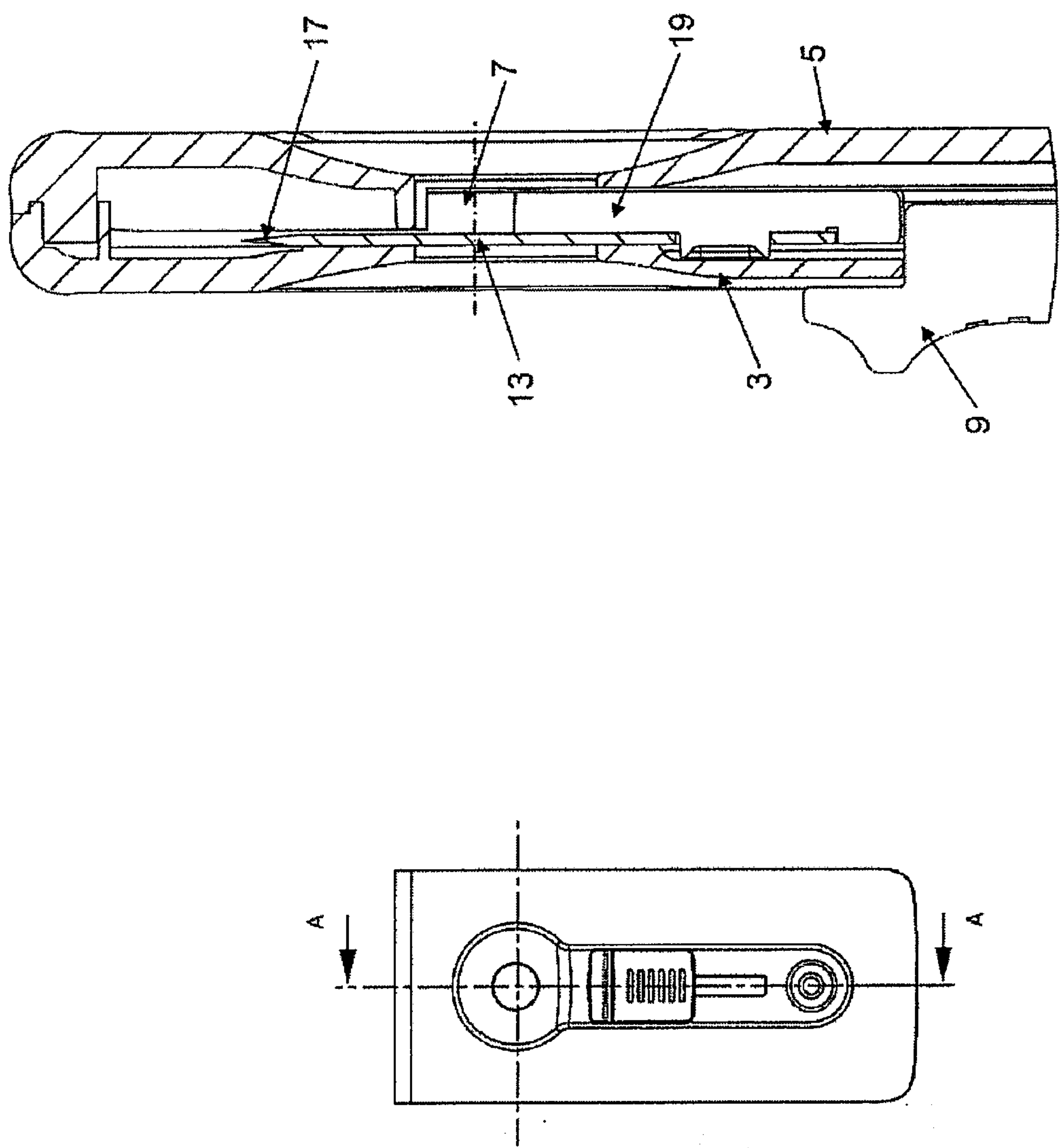


Fig. 4

