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Description

The invention relates to a stimulation device having a sleeve-shaped body formed by an at least partially flexible wall which has a first end section with a first end forming a first end of the sleeve-shaped body and a second end section which is situated away from the first end section with a second end forming a second end of the sleeve-shaped body, lying substantially opposite the first end, arranged at a distance from the first end, and containing an opening for the inserting of a body part sensitive to stimulation into the sleeve-shaped body, and a loading mechanism which is designed to act on the first end section of the wall of the sleeve-shaped body with a time-variable, in particular oscillating first force that varies the distance between the first end of the sleeve-shaped body and the second end of the sleeve-shaped body, alternately as a pulling force for relative lengthening of the distance between the first end and the second end of the sleeve-shaped body and as a compressive force for relative shortening of the distance between the first end and the second end of the sleeve-shaped body.

Such a stimulation device is known from US 5 876 324 A and is used in particular to stimulate a penis, which for this purpose is to be inserted through the opening into the sleeve-shaped body. The sleeve-shaped body is preferably an insert made of a soft elastic material, which is brought into touching engagement or frictional engagement with the body part that is sensitive to stimulation.

The object of the invention is to propose a stimulation device of the type stated above with a better stimulation-triggering effect.

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This object is achieved with a stimulation device having a sleeve-shaped body formed by an at least partially flexible wall which has a first end section with a first end forming a first end of the sleeve-shaped body and a second end
10 section which is situated away from the first end section with a second end forming a second end of the sleeve-shaped body, lying substantially opposite the first end, arranged at a distance from the first end, and containing an opening for the inserting of a body part sensitive to stimulation
15 into the sleeve-shaped body, characterised by a loading mechanism which is designed to act on the first end section of the wall of the sleeve-shaped body with a time-variable, in particular oscillating first force that varies the distance between the first end of the sleeve-shaped body
20 and the second end of the sleeve-shaped body, alternately as a pulling force for relative lengthening of the distance between the first end and the second end of the sleeve-shaped body and as a compressive force for relative shortening of the distance between the first end and the
25 second end of the sleeve-shaped body, characterised in that outside the sleeve-shaped body a chamber is provided, the wall of which has a first section, formed at least partially by the first end section of the wall of the sleeve-shaped body, and the loading mechanism is designed,
30 in order to act on the first end section of the wall of the sleeve-shaped body with the first force as a pulling force, to produce a negative pressure in the chamber for lengthening the distance between the first end and the

second end of the sleeve-shaped body, and in order to act on the first end section of the wall of the sleeve-shaped body with the first force as a compressive force, to produce an overpressure in the chamber.

5 With the aid of the loading mechanism provided according to the invention, a stimulation effect can be achieved that is not only better than that of the prior art but is also of a different type. This is achieved according to the invention in that the sleeve-shaped body with the first end section
10 of its wall, which is the inner end section, and thus with its inner first end, is alternately stretched and shortened in the direction of its length. The resulting alternating change in length of the inner first end section of the wall of the sleeve-shaped body produces a special stimulating
15 effect on the section of the body part that is sensitive to stimulation inserted through the opening into the sleeve-shaped body that is in engagement with the first end section of the wall of the sleeve-shaped body, in that either due to a relative movement of the first end section
20 of the wall of the sleeve-shaped body in relation to the adjacent section of the body part a stimulating frictional effect is produced on this, or during its alternating movement in both directions the first end section of the wall of the sleeve-shaped body takes with it the adjacent
25 section of the body part or at least its skin, which also leads to a special stimulation effect. In this, the loading mechanism acts pneumatically, so to speak, and can thus be realised in a particularly easy and at the same time effective manner.

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Preferred embodiments and further embodiments of the invention are given in the dependent claims.

In particular for the stimulation of elongated body parts such as a penis, for example, it is useful that the sleeve-shaped body has an elongated shape between its first end and its second end and that the loading mechanism is
5 designed to orient the first force approximately in the longitudinal direction of the sleeve-shaped body.

Preferably the wall of the chamber has an at least partially flexible second section and the loading mechanism
10 has a drive device designed to reciprocally move the second section of the wall of the chamber between a first position and a second position, in order then to produce alternately a negative pressure and an overpressure.

15 In a further embodiment, the second section of the wall of the chamber lies opposite its first section and is arranged away from its first section.

Furthermore, the drive device can be designed to move the
20 second section of the wall of the chamber approximately in the longitudinal direction of the sleeve-shaped body. In this way, the overpressure and negative pressure bringing about the change in length of the sleeve-shaped body can be produced in an easy and particularly effective manner.

25 Usefully, the second section of the wall of the chamber has a membrane, the reciprocal movement of which by the drive device of the loading mechanism alternately produces an overpressure and a negative pressure.

30 The device is preferably provided with a housing that has a wall and receives the sleeve-shaped body and the loading mechanism, the second end section of the wall of the

sleeve-shaped body being attached to the wall of the housing.

The chamber preferably has a closable opening leading to
5 the outside. This opening can usefully be partially or
completely closed by a finger of the user, if required, in
order in this way to manually control the pressure in the
chamber. If the opening is completely closed, the pressure
conditions in the first chamber remain unchanged. If, on
10 the other hand, the opening is partially closed or opened,
a slight pressure equalisation with the outside is brought
about with the result that the pressure in the first
chamber is correspondingly lower. The opening can contain a
check valve, which closes when there is negative pressure
15 in the chamber and opens when there is overpressure in the
chamber; manual control with the aid of a finger of the
user is thus only possible when there is overpressure,
while when there is negative pressure an undesired pressure
equalisation with the outside is avoided.

20

The wall of the chamber preferably has a third section and
the wall of the sleeve-shaped body is attached in the
region of its first section or adjacent to it on the third
section of the wall of the chamber. The third section of
25 the wall of the chamber can be arranged between its first
section and its second section. For an advantageous fixing
of the sleeve-shaped body on the housing, preferably an
outwardly protruding collar is formed on the outside of the
wall of the sleeve-shaped body in the region of its first
30 end section or adjacent to it, which is attached to the
third section of the wall of the chamber.

In a further preferred embodiment, the device is provided with a housing that receives the sleeve-shaped body and the loading mechanism and has a first housing part and a second housing part detachably arranged on the first housing part, with the first housing part receiving the sleeve-shaped body with the second end section of its wall and being arranged in the region of the first end section of the wall of the sleeve-shaped body or adjacent to its first end section on the second housing part. Such a two-part design of the housing enables, on the one hand, easier cleaning of the interior of the housing and the sleeve-shaped body and also easy exchanging of the sleeve-shaped body and, on the other hand, easy access to the loading mechanism, for example for the purpose of repair or exchanging or replacement of a battery supplying the loading mechanism with an electric current.

An alternative embodiment, in which the wall of the sleeve-shaped body has an intermediate section provided between the first end section and the second end section with wall sections that are opposite one another at a distance defining an opening cross-section of the sleeve-shaped body, is characterised in that the loading mechanism is further designed to act on the intermediate section of the wall of the sleeve-shaped body with a time-variable, in particular oscillating second force that varies the distance between the opposing wall sections of the intermediate section of the wall of the sleeve-shaped body, alternately as a compressive force for relative shortening of the distance between the opposing wall sections and as a pulling force for relative lengthening of the distance between the opposing wall sections, outside the sleeve-shaped body and the first chamber a second chamber is

provided, the wall of which has a first section, formed at least partially by the intermediate section of the wall of the sleeve-shaped body, and the loading mechanism is further designed, in order to act on the intermediate
5 section of the wall of the sleeve-shaped body with the second force as a compressive force, to produce an overpressure in the second chamber, and in order to act on the intermediate section of the wall of the sleeve-shaped body with the second force as a pulling force, to produce a
10 negative pressure in the second chamber. With this alternative embodiment the stimulation effect can be further increased in that the loading mechanism acts not only on the inner first end section of the wall of the sleeve-shaped body and thus its inner first end in the
15 longitudinal direction of the sleeve-shaped body alternately with a pulling force and a compressive force in order to change the length of the sleeve-shaped body and in doing so stretch it temporarily, but also acts on the sleeve-shaped body at a point between its first end and its
20 second end alternately with a pulling force and compressive force acting transversely to its longitudinal direction in order to change the cross-section of the sleeve-shaped body and temporarily form a narrowing in the sleeve-shaped body. The overpressure that arises when the sleeve-shaped body is
25 stretched in the longitudinal direction is skilfully used for the narrowing of the sleeve-shaped body intended substantially at the same time. The amount of the difference between the negative pressure and a normal pressure should usefully correspond approximately to the
30 amount of the difference between the overpressure and the normal pressure.

A further embodiment of this embodiment is characterised in that the loading mechanism is designed, substantially at the same time, to act on the first end section of the wall of the sleeve-shaped body with the first force as a pulling force and the intermediate section of the wall of the sleeve-shaped body with the second force as a compressive force and / or substantially at the same time to act on the first end section of the wall of the sleeve-shaped body with the first force as a compressive force and the intermediate section of the wall of the sleeve-shaped body with the second force as a pulling force. In this further embodiment, accordingly, the loading mechanism brings about alternately a narrowing of the cross-section of the sleeve-shaped body at the same time as its stretching in the longitudinal direction and an expansion and, in particular, return of the sleeve-shaped body to its initial cross-section at the same time as a shortening, in particular to its initial length.

The sleeve-shaped body preferably has an elongated shape between its first end and its second end in particular for the stimulation of elongated body parts such as a penis, for example, and the loading mechanism is designed to orient the second force approximately transversely to the longitudinal direction of the sleeve-shaped body.

The ratio between the first force and the second force should usefully be determined such that the volume of the cavity delimited by the sleeve-shaped body remains substantially unchanged.

In a further preferred further embodiment, the wall of the first chamber has an at least partially flexible second

section and the wall of the second chamber has a second section, which is formed by the second section of the wall of the first chamber, and the loading mechanism has a drive device which is designed to reciprocally move the second
5 section of the wall of the first chamber between a first position and a second position. The second section of the wall of the first chamber should preferably lie opposite its first section and be arranged at a distance from its first section.

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The drive device should preferably be designed to move the second section of the wall of the first chamber approximately in the longitudinal direction of the sleeve-shaped body. In this way, the overpressure and negative
15 pressure bringing about the change in length of the sleeve-shaped body can be produced in an easy and particularly effective manner. The second section of the wall of the first chamber usefully has a membrane.

20 In the alternative embodiment as well, the device can be provided with a housing that has a wall and receives the sleeve-shaped body and the loading mechanism, the wall of the second chamber having a third section which is spaced apart from its first section and is formed by a section of
25 the wall of the housing.

For a particularly effective fixing of the sleeve-shaped body on the housing, the second end section of the wall of the sleeve-shaped body can be attached to the wall of the
30 housing. At the same time, the second end section of the wall of the sleeve-shaped body should form a sealing closure of the second chamber on the wall of the housing in

order to prevent an undesired pressure equalisation with the outside.

In the alternative embodiment as well, the first chamber
5 can preferably have a closable opening leading to the outside, which can usefully be partially or completely closed with a finger of the user for manual control of the pressure conditions in the first chamber. If the opening is completely closed, the pressure conditions in the first
10 chamber remain unchanged. If, on the other hand, the opening is partially closed or opened, a slight pressure equalisation with the outside is brought about with the result that the pressure in the first chamber is correspondingly lower. The opening can preferably contain a
15 check valve that closes when there is negative pressure in the first chamber and opens when there is overpressure in the first chamber, so that in the event of a negative pressure in the first chamber an undesired pressure equalisation with the outside is prevented and manual
20 control of the pressure conditions in the first chamber by partially or completely closing the opening with a finger of the user is only possible in the case of an overpressure in the first chamber.

25 In a further embodiment of the alternative embodiment, the wall of the first chamber has a third section and the wall of the sleeve-shaped body is attached to the third section of the wall of the first chamber in the connecting area between its first end section and its intermediate section.

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In a further preferred further embodiment, the third section of the wall of the first chamber is arranged between its first section and its second section.

For a further advantageous fixing of the sleeve-shaped body, an outwardly protruding collar is preferably formed on the outside of the wall of the sleeve-shaped body in the connecting area between its first end section and its intermediate section, and is attached to the third section of the wall of the first chamber.

Furthermore, the wall of the second chamber can have a fourth section which is formed by the third section of the wall of the first chamber.

In the further preferred embodiment as well, the device can preferably be provided with a housing that receives the sleeve-shaped body and the loading mechanism and has a first housing part and a second housing part detachably arranged on the first housing part, with the first housing part receiving the sleeve-shaped body substantially with the intermediate section and the second end section of its wall and being arranged in the connecting area between the first end section and the intermediate section of the wall of the sleeve-shaped body on the second housing part. Such a two-part design of the housing enables, on the one hand, easier cleaning of the interior of the housing and the sleeve-shaped body and also easy exchanging of the sleeve-shaped body and, on the other hand, easy access to the loading mechanism, for example for the purpose of repair or exchanging or replacement of a battery supplying the loading mechanism with an electric current. The second housing part can usefully be arranged in the region of the third section of the wall of the first chamber on the housing part.

For further increasing of the stimulation effect, the inside of the wall of the sleeve-shaped body can preferably be provided at least in sections with structural elements such as, for example, knobs.

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To control the stimulation effect, a control device can also preferably be provided which controls the loading mechanism and has at least one operating means in order to set at least one predetermined operating mode for the loading mechanism, the operating means usefully having at least one switch or a push-button.

Finally, the device can preferably be designed as a hand-held device, preferably operated with a battery for supplying energy to the loading mechanism.

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Preferred embodiments of the invention are explained in more detail below with reference to the accompanying drawings.

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Fig. 1 shows a first preferred embodiment of the stimulation device in a perspective view;

Fig. 2 shows a longitudinal section through the device of Fig. 1;

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Fig. 3 shows the same longitudinal section as Fig. 2, but with housing parts detached from one another;

Fig. 4 shows the same longitudinal section as Fig. 2, but with an additional dashed representation of the membrane in an intermediate position between a first end position (not

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shown) and a second end position, in which the membrane is shown in solid lines;

Fig. 5 shows the same longitudinal section as Fig. 2, but
5 with an illustration of the membrane in its first end position and an additional dashed representation of the membrane in its second end position;

Fig. 6 shows the same longitudinal section as Figures 2 and
10 4 with an additional representation of a finger of the user for closing an opening for manual control of the pressure conditions;

Fig. 7 shows a second preferred embodiment of the
15 stimulation device in longitudinal section;

Fig. 8 shows a third preferred embodiment of the stimulation device in a perspective view;

20 Fig. 9 shows a longitudinal section through the device of Fig. 8;

Fig. 10 shows the same longitudinal section as Fig. 9, but with housing parts detached from one another;

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Fig. 11 shows the same longitudinal section as Fig. 9, but with an additional dashed representation of the membrane in an intermediate position between a first end position (not shown) and a second end position, in which the membrane is
30 shown in solid lines;

Fig. 12 shows the same longitudinal section as Fig. 9, but with an illustration of the membrane in its first end

position and an additional dashed representation of the membrane in its second end position;

Fig. 13 shows the same longitudinal section as Figures 9 and 11 with an additional representation of a finger of the user for closing an opening for manual control of the pressure conditions.

In Figures 1 to 6 a stimulation device 2 is shown according to a first preferred embodiment of the invention. The stimulation device 2 has a housing, which in the illustrated embodiment is divided into a first housing part 4, which is delimited by a circumferential wall 4a and a free end 4b, and into a second housing part 6, which is delimited by a circumferential wall 6a and a free end 6b. At the free end 4b of the first housing part 4 there is an opening 8 for the inserting of a body part that is sensitive to stimulation, such as for example a penis. As Fig. 1 also shows, in the region of the circumferential wall 6a of the second housing part 6 control buttons 10 are arranged, which are preferably formed as electric push-buttons and serve to switch the stimulation device on and off and to control the stimulation device with the aid of an electronic control circuit not shown in the figures.

As can be seen in detail in Figures 2 to 6, in the illustrated embodiment a sleeve-shaped body 12 is arranged inside the first housing part 4, of which the interior or hollow cavity 12a is delimited by a wall 14 which is divided into a first end section 14a, a second end section 14b and a middle section 14c between these two end sections 14a, 14b. In the illustrated embodiment the first end section 14a of the wall 14 has the shape of a closed dome

or a closed cap and forms a first end 14aa, which at the same time also forms a first end of the sleeve-shaped body 12. The second end section 14b of the wall 14 at a distance away from this has a second end 14bb, which at the same

5 time also forms the outer second end of the sleeve-shaped body 12 and is provided with the already mentioned opening 8 for the inserting of a body part sensitive to stimulation into the cavity 12a of the sleeve-shaped body 12. Regarding the free end 4b of the first housing part 4 and the opening

10 8, the first end section 14a and/or the first end 14aa of the wall 14 of the sleeve-shaped body 12 can alternatively also be indicated as the distal or inner first end section 14a and/or as the distal or inner first end 14aa and the second end section 14b and/or the second end 14bb of the

15 wall 14 of the sleeve-shaped body 12 can alternatively also be indicated as the proximal or partially external second end section 14b and/or as the proximal or external second end 14bb. As can also be seen in Figures 2 to 6, between its two ends the sleeve-shaped body 12 has an elongated

20 shape, which in the illustrated embodiment is substantially cylindrical, particularly in the region of the middle section 14c of the wall 14. In the illustrated embodiment, furthermore, on the inside of the wall 14 of the sleeve-shaped body 12, an inwardly protruding projection 14d,

25 which forms a narrowing, is arranged in the connecting area between the first end section 14a and the middle section 14c, whereby this projection 14d can optionally be formed to be circumferential or can be provided with interruptions to form knobs in the circumferential direction. The wall 14

30 of the sleeve-shaped body 12 consists of at least partially flexible, preferably elastic, material which, for example, features silicone, which is not only a particularly soft, but also hygienic material.

As can also be seen in Figures 2 to 6, in the illustrated embodiment, the free end 4b of the first housing part 4 forms an inwardly angled flange-like edge which to fix the adjacent section of the sleeve-shaped body 12 engages with the second end section 14b of the wall 14 of the sleeve-shaped body 12.

Also in the connecting area between its first end section 14a and its middle section 14c, the wall 14 of the sleeve-shaped body 12 is provided on the outside with an outwardly protruding collar 16, as Figures 2 to 6 also show. Adjacent to and opposite the collar 16, an inwardly protruding fastening projection 18 is formed on the inside of the wall 4a of the first housing part 4, which contains a recess 20 which communicates with the interior of the first housing part 4 via an opening 22. As can be seen in particular from Fig. 2, the collar 16 provided on the outside of the wall 14 of the sleeve-shaped body 12 protrudes through the opening 22 into the recess 20 and, in the embodiment illustrated, engages an inner wall section of the recess 20 with a downwardly-angled end 16a. The collar 16 is preferably designed as a collar running round the sleeve-shaped body 12 and accordingly also the fastening projection 18 with the recess 20 on the inner wall of the first housing part 4 is designed to be circumferential; alternatively, however, it is also possible to subdivide accordingly the collar 16 into discrete components that are spaced apart from one another and thus also the fastening projection 18 or at least the recess 20.

As can also be seen in Figures 2 to 6, a circumferential wall section 24 is provided adjacent at a distance from the first end section 14a of the wall 14 of the sleeve-shaped

body 12 outside the sleeve-shaped body 12, which is arranged on the inside of the wall 6a of the second housing part 6 and ends with a circumferential free end inside the second housing part 6, which is sealed off by a membrane 5 26, which thus is also arranged outside the sleeve-shaped body 12 and, in the illustrated embodiment, is spaced apart from the first end 14aa of the wall 14 of the sleeve-shaped body 12. The first end section 14a of the wall 14 of the sleeve-shaped body 12, the wall section 24 and the membrane 10 26 thus delimit a first chamber 28.

As can be seen in particular from Fig. 2 in conjunction with Fig. 3, the recess 20 receiving the angled end 16a of the collar 16 formed on the outside of the wall 14 of the sleeve-shaped body 12 is delimited on its side facing the 15 second housing part 6 by a section of the wall section 24. Since the wall section 24 is provided on the second housing part 6, this arrangement has the result that when the second housing part 6 is separated from the first housing part 4 (cf. Fig. 3) the recess 20 is opened, so that for 20 assembly or disassembly of the sleeve-shaped body 12, the collar 16 with its angled end 16a can be inserted easily into the now opened recess 20 or removed from the recess 20.

As can also be seen in Figures 2 to 6, an electric motor 30 25 is arranged in the second housing part 6, and a radially extending lever 32 is attached to its output shaft 30a in a rotationally fixed manner. Adjacent to its free end, a connecting rod 34 is hinged on the lever 32 with a first end 34a. The connecting rod 34 is attached to the membrane 30 26 with its other end 34b. The lever 32 and the connecting rod 34 thus together form an eccentric gear in order to convert the rotation of the output shaft 30a of the

electric motor 30 into a reciprocal longitudinal movement of the connecting rod 34. To supply power to the electric motor 30, a rechargeable battery or a battery 36 is provided, which is also located inside the second housing part 6 in a compartment 38 provided for this purpose, which is delimited by a separating wall 40.

Furthermore, with regard to the first chamber 28 outside the wall section 24 and the membrane 26 inside the second housing part 6 a second chamber 42 is formed, which is delimited by the wall 6a of the second housing part 6, the wall section 24, the membrane 26 and the separating wall 40.

Since the membrane 26 consists of flexible material such as silicone in particular, the reciprocal longitudinal movement of the connecting rod 34 in the direction of the double arrow A shown in Figures 4 to 6 leads to a corresponding movement of the membrane 26, as is shown schematically in Figures 4 and 5; in other words, during its reciprocal movement in the longitudinal direction the connecting rod 34 takes the membrane 26 with it accordingly. Since the membrane 26 is attached to the wall section 24 with its outer end, the reciprocal movement of the connecting rod 34 brings about a change in the shape of the membrane 26, and in this the movement stroke of the membrane 26 is at its greatest in its centre, where the connecting rod 34 is attached with its adjacent end 34b, and corresponds to the movement stroke of the connecting rod 34. The reciprocal longitudinal movement of the connecting rod 34 is oriented approximately in the longitudinal direction of the sleeve-shaped body 12, so that due to the movement of the connecting rod 34, the

membrane 26 is subjected to a change in its distance from the adjacent first end 14aa of the wall 14 of the sleeve-shaped body 12, in other words, by being moved alternately in the direction of the first end 14aa of the wall 14 of the sleeve-shaped body 12 and away from it.

In Fig. 5 the membrane 26 is shown in its first end position closest to the sleeve-shaped body 12 in solid lines. Fig. 5 shows that in the (according to Fig. 5 lower) first end position the membrane 26 takes a shape that is curved in the direction of the sleeve-shaped body 12. When the membrane 26 is in its first end position, at the same time the opposite first end section 14a of the wall 14 of the sleeve-shaped body 12 also takes a defined first end position in which the distance between the first end 14aa of the wall 14 of the sleeve-shaped body 12 from the membrane 26 is minimal. In Fig. 5 the first end section 14a of the wall 14 of the sleeve-shaped body 12 is shown in its (according to Fig. 5 lower) first end position in solid lines. Furthermore, in Fig. 5 the membrane 26 is shown in its (according to Fig. 5 upper) second end position at a distance from the sleeve-shaped body 12 in dashed lines, in which the membrane 26 now takes an upwardly curved bent shape opposite to the first end position. When the membrane 26 is in its second end position, the first end section 14a of the wall 14 of the sleeve-shaped body 12 also takes a defined (according to Fig. 5 upper) second end position adapted to it, which is also shown in Fig. 5 in dashed lines. Thus, Fig. 5 shows that the sleeve-shaped body 12 in the second end position of the first end section 14a of its wall 14 is stretched and thus lengthened in its longitudinal direction relative to its first end position. Purely for the sake of clarity, it should also be noted in

this connection that in Figures 2 to 4 and 6 the membrane 26 is shown in each case in its second end position, while in contrast the first end section 14a of the wall 14 of the sleeve-shaped body 12 is shown in its first end position;

5 Figures 4 and 6 also show the membrane 26 in an intermediate position, shown in dashed lines, between the two previously mentioned end positions.

The movement of the membrane 26 from its (according to Fig. 5 lower) first end position to its (according to Fig. 5 upper) second end position brings about a movement of the
10 first end section 14a of the wall 14 of the sleeve-shaped body 12 from its (according to Fig. 5 lower) first end position to its (according to Fig. 5 upper) second end position, so that due to the reciprocal movement of the
15 connecting rod 34, the movement of the membrane 26 has a direct effect on the movement of the first end section 14a of the wall 14 of the sleeve-shaped body 12. The reason for this is the first chamber 28, which is formed between the first end section 14a of the wall 14 of the sleeve-shaped
20 body 12 on the one hand and the membrane 26 on the other hand and is filled with air. The air in the first chamber is responsible for the fact that when the membrane 26 moves, the first end section 14a of the wall 14 of the sleeve-shaped body 12 is taken with it accordingly. When
25 the membrane 26 moves from its (according to Fig. 5 lower) first end position to the (according to Fig. 5 upper) second end position, initially the volume in the first chamber 28 is increased and as a result a negative pressure is initially created there, due to which the first end
30 section 14a of the wall 14 of the sleeve-shaped body 12 is acted on by a corresponding pulling force. This pulling force then causes a movement of the first end section 14a

of the wall 14 of the sleeve-shaped body 12 into the (according to Fig. 5 upper) second end position, dashed in Fig. 5, until the negative pressure in the first chamber 28 is reduced and the air pressure is normal again. Thus,

5 during the movement of the membrane 26 from the first end position into the second end position, the first end section 14a of the wall 14 of the sleeve-shaped body 12 is taken with it accordingly via the cushion of air in the first chamber 28, in the manner of a suction effect, which
10 leads to a stretching of the sleeve-shaped body 12 in the direction of its longitudinal extension and thus leads to an increase in its length. When the membrane 26 moves in the opposite direction from its (according to Fig. 5 upper) second end position to its (according to Fig. 5 lower) first end position, an overpressure initially occurs in the
15 first chamber 28, which exerts a compressive force on the first end 14aa of the wall 14 of the sleeve-shaped body 12 which at this point is still stretched, which now ensures that the first end section 14a of the wall 14 of the
20 sleeve-shaped body 12 returns to its (according to Fig. 5 lower) first end position shown in Fig. 5 in solid lines.

The alternating change in length of the first end section 14a of the wall 14 of the sleeve-shaped body 12 brought about by the reciprocal movement of the connecting rod 34
25 produces a special stimulating effect on the section of a body part sensitive to stimulation inserted through the opening 8 into the sleeve-shaped body 12, not shown in the figures, which is in engagement with the first end section 14a of the wall 14 of the sleeve-shaped body 12, either in
30 that due to a relative movement of the first end section 14a of the wall 14 of the sleeve-shaped body 12 a stimulating frictional action is produced on the body part

relative to the adjacent section of said body part, or in that during its movement alternating in both directions the first end section 14a of the wall 14 of the sleeve-shaped body 12 takes with it the adjacent section of said body
5 part or at least its skin, which also leads to a special stimulation effect.

To prevent an undesired cushion of air being formed in the second chamber 42, which would form a kind of abutment against the movement of the membrane 26 and thus impair or
10 even completely prevent the movement of the membrane 26, a vent hole 44 is provided in the wall 6a of the second housing part 6, which ensures a constant pressure equalisation between the second chamber 42 and the outside. This ensures undisturbed movement of the membrane 26.

15 As can be seen in particular from Fig. 6, an opening 46 is provided with which the first chamber 28 can communicate to the outside. This opening 46 can usefully be partially or completely closed if required by a finger 48 of a user, not shown in the figures, in order in this way to manually
20 control the pressure in the first chamber 28. If the opening 46 is completely closed, the pressure conditions in the first chamber 28 remain unchanged. If, on the other hand, the opening 46 is partially closed or opened, with this a slight pressure equalisation with the outside is
25 brought about with the result that the pressure in the first chamber 28 is correspondingly lower. The opening 46 should contain a check valve, not shown in the figures, which closes when there is negative pressure in the first chamber 28 and opens when there is overpressure in the
30 first chamber 28, so that in the event of a negative pressure in the first chamber 28, an undesired pressure equalisation with the outside is avoided and manual control

of the pressure conditions in the first chamber 28 by partially or completely closing the opening 46 with the finger 48 of a user is only possible in the event of an overpressure in the first chamber 28.

5 Fig. 7 shows a stimulation device 2' according to a second preferred embodiment, with the same components being identified with the same reference characters as with the stimulation device 2 according to the first preferred embodiment, so that in this regard, to avoid repetitions,
10 see the description given on the basis of Figures 1 to 6.

The stimulation device 2' according to the second preferred embodiment uses the same functional principle as the stimulation device 2 according to the first preferred embodiment. The difference compared to the stimulation
15 device 2 according to the first preferred embodiment is that in the stimulation device 2' according to the first preferred embodiment, there is no first housing part 4 and the second housing part 6 is provided as the only housing, and therefore in addition to the (according to Fig. 7
20 upper) free end 6b has a further (according to Fig. 7 lower) free end 6c at a distance from this free end 6b, to which the collar 16 of the wall 14 of the sleeve-shaped body 12 is attached. Since at the (according to Fig. 7
25 lower) free end 6c of the housing part 6 the second chamber 42 is open to the outside at a point indicated in Fig. 7 with the reference character "42a", the vent hole 44 provided in the stimulation device 2 according to the first preferred embodiment can furthermore be omitted. The use of the second housing part 6 of the stimulation device 2
30 according to the first preferred embodiment as the only housing also has the result that the sleeve-shaped body 12 has a significantly shorter length and is therefore

significantly shortened, as can also be seen in Fig. 7 compared with Figures 1 to 6. Thus, the second end section 14b of the wall 14 of the sleeve-shaped body 12 is attached directly to the collar 16 and is significantly shorter than the stimulation device 2 according to the first preferred embodiment. Accordingly, the stimulation device 2' according to the preferred second embodiment is a structurally simplified version and is more compact in terms of its shape compared with the stimulation device 2 according to the first preferred embodiment.

A stimulation device 2" according to a third preferred embodiment is shown in Figures 8 to 13, where the view in Figures 8 to 13 corresponds to Figures 1 to 6 and with regard to the stimulation device 2 according to the first preferred embodiment the same components are indicated with the same reference characters, so in this regard, to avoid repetitions, see the description of the stimulation device 2 according to the first preferred embodiment given previously on the basis of Figures 1 to 6.

At first sight, the stimulation device 2" according to the third preferred embodiment appears to be the same as the stimulation device 2 according to the first preferred embodiment. However, there is an important difference in the way it works, which is also reflected in constructional differences.

With the stimulation device 2" according to the third preferred embodiment, too, an oscillating change in length of the sleeve-shaped body 12 takes place due to the reciprocal movement of the membrane 26 oriented in the longitudinal direction of the sleeve-shaped body 12, so in this regard, too, see the description of the stimulation device 2 according to the first preferred embodiment given

previously on the basis of Figures 1 to 6. However, in contrast to the stimulation device 2 according to the first preferred embodiment, the second chamber 42 is closed to the outside and thus also there is no vent hole 44, so that
5 due to the reciprocal movement of the membrane 26, likewise oscillating pressure conditions occur there, but in an opposite or reverse way to the oscillating pressure conditions occurring in the first chamber 28. When the membrane 26 is moved from its (according to Fig. 12 lower)
10 first end position shown in solid lines in Fig. 12 to its (according to Figures 9 to 13 upper) second end position shown in Figures 9 to 11 and 13 in solid lines and in Fig. 12 shown in dashed lines, initially an overpressure is created in the second chamber 42, with which the middle
15 section 14c of the wall 14 of the sleeve-shaped body 12 is then acted upon from outside, which results in a shortening of the distance between opposing wall sections 14cc of the middle section 14c of the wall 14 of the sleeve-shaped body 12, as can be seen from Fig. 12, in which those wall
20 sections 14cc are shown schematically in dashed lines. The second chamber 42 is formed not only by the space between the membrane 26 and the separating wall 40, but also by a space which is delimited on the one hand by the wall 4a of the first housing part 4 and on the other hand by the wall
25 section 24 and also the middle section 14c and the second end section 14b of the wall 14 of the sleeve-shaped body 12. Thus, the second chamber 42 also extends along the outside of the sleeve-shaped body 12 to the second end section 14b of its wall 14, which is sealingly attached to
30 the wall 4a of the first housing part 4 in the region of its free end 4b. The overpressure initially arising in the second chamber 42 as a result of the movement of the membrane 26 from its first end position to its second end

position has the result that the air in the second chamber 42 is displaced in the direction of the arrows B shown in Figures 11 to 13 and then strikes the outside of the middle section 14c of the wall 14 of the sleeve-shaped body 12.

5 There the air then produces a compressive force that acts transversely from the outside on the middle section 14c of the wall 14 of the sleeve-shaped body 12 in the direction of the arrows C shown in Figures 11 to 13. This compressive force brings about the already previously mentioned
10 reduction in the distance between the opposing wall sections 14cc in the region of the middle section 14c of the wall 14 of the sleeve-shaped body 12 and thus in this region a narrowing of the cavity 12a of the sleeve-shaped body 12, as shown schematically in Fig. 12 in dashed lines.
15 Accordingly, the movement of the membrane 26 from its (according to Fig. 12 lower) first end position to its (according to Fig. 12 upper) second end position results not only in a stretching, but at the same time also a narrowing of the sleeve-shaped body 12.

20 When the membrane 26 moves in the opposite direction from its (according to Fig. 12 upper) second end position to its (according to Fig. 12 lower) end position, a negative pressure initially arises in the second chamber 42, which ensures an opposite air flow counter to the orientation of
25 the arrows B and C shown in Figures 11 to 13 and thus away from the middle section 14c of the wall 14 of the sleeve-shaped body 12. As a result, the opposing wall sections 14cc of the middle section 14c of the wall 14 of the sleeve-shaped body 12 are acted on by a pulling force which
30 ensures that by increasing their distance from one another, these wall sections 14cc return to their substantially straight starting position shown in solid lines in Figures

9 to 13 and the narrowing of the cavity 12a of the sleeve-shaped body 12 is eliminated. Thus, in this step, in addition to the shortening of its length, at the same time the middle section 14c of the wall 14 of the sleeve-shaped body 12 is also returned to its original, substantially straight starting position by increasing the distance between its wall sections 14cc and the resulting eliminating of the narrowing.

Accordingly, with the stimulation device 2" according to the third preferred embodiment shown in Figures 9 to 13, the stimulation effect can be further increased in that not only the first end section 14a of the wall 14 of the sleeve-shaped body 12 and thus its first end is acted on in the longitudinal direction of the sleeve-shaped body 12 alternately by a pulling force and a compressive force in order to change the length of the sleeve-shaped body 12 and temporarily stretch it, but also the sleeve-shaped body 12 is acted on in the region of the middle section 14c of its wall 14 alternately by a pulling force and a compressive force acting transversely to its longitudinal direction in order to change the cross-section of the sleeve-shaped body 12 and thereby temporarily produce a narrowing. It follows from this that in the stimulation device 2" according to the third preferred embodiment, the overpressure or negative pressure produced by the membrane 26 outside the first chamber 28 in the second chamber 42 is used skilfully for a further stimulation effect by temporarily narrowing the sleeve-shaped body 12.

Patentkrav**1. Stimulationsapparat med**

et muffeformigt legeme (12), der er dannet af en i det mindste delvis fleksibel væg (14), der har et første endearsnit (14a) med en første ende (14aa), der danner en første ende af det muffeformige legeme (12) og et fjernt fra det første endearsnit (14a) liggende andet endearsnit (14b) med en anden ende (14bb), der danner en anden ende af det muffeformige legeme (12), i det væsentlige ligger over for den første ende (14aa), er anbragt i en afstand fra den første ende (14aa) og indeholder en åbning (8) til indføring af en til stimulation følsom legemsdel i det muffeformige legeme (12),

en slagindretning (26, 30, 32, 34), der er udformet til at slå imod det første endearsnit (14a) af det muffeformige legemes (12) væg (14) med en med tiden foranderlig, især oscillerende første kraft, der ændrer afstanden mellem den første ende af det muffeformige legeme (12) og den anden ende af det muffeformige legeme (12), skiftevis som trækraft til relativ forlængelse af afstanden mellem den første ende og den anden ende af det muffeformige legeme (12) og som trykkraft til relativ formindskelse af afstanden mellem den første ende og den anden ende af det muffeformige legeme (12), og

et første kammer (28), der er tilvejebragt uden for det muffeformige legeme (12), og hvis væg har et første afsnit, der i det mindste delvis dannes af det første endearsnit (14a) af det muffeformige legemes (12) væg (14),

kendetegnet ved, at

slagindretningen (26, 30, 32, 34) er udformet til for at trykke på det første endearsnit (14a) af det muffeformige legemes (12) væg (14) med den første kraft som trækraft i det første kammer (28) at frembringe et undertryk til forlængelse af afstanden mellem den første ende og den anden ende af det muffeformige legeme (12) og for at trykke på det første endearsnit (14a) af det muffeformige legemes (12) væg (14) med den første kraft som trykkraft i det første kammer (28) at frembringe et overtryk.

2. Apparat ifølge krav 1,

i hvilket det muffeformige legeme (12) har en langstrakt form mellem sin første ende (14aa) og sin anden ende, og slagindretningen (26, 30, 32, 34) er udformet til at orientere den første kraft omtrent i det muffeformige legemes (12) længderetning.

3. Apparat ifølge krav 1 eller 2,**kendetegnet ved, at**

kammerets (28) væg har et i det mindste delvis fleksibelt andet afsnit (26), og slagindretningen (26, 30, 32, 34) har en drivindretning (30, 32, 34), der er udformet til at bevæge det andet afsnit (26) af kammerets (28) væg frem og tilbage mellem en første stilling og en anden stilling, idet især det andet afsnit (26) af kammerets (28) væg (14) ligger over for dets første afsnit og er anbragt fjernt fra dets første afsnit.

4. Apparat ifølge krav 2 og 3,

kendetegnet ved, at drivindretningen (30, 32, 34) er udformet til at bevæge det andet afsnit (26) af kammerets (28) væg (14) omtrent i det muffeformige legemes (12) længderetning.

5. Apparat ifølge krav 3 eller 4,

kendetegnet ved, at det andet afsnit (26) af kammerets (28) væg har en membran.

6. Apparat ifølge mindst et af de foregående krav med et hus (4, 6), der har en væg (4a, 6a) og optager det muffeformige legeme (12) og slagindretningen (26, 30, 32, 34),

kendetegnet ved, at det andet endeafsnit (14b) af det muffeformige legemes (12) væg (14) er fastgjort til husets (4, 6) væg (6b).

7. Apparat ifølge mindst et af de foregående krav,

kendetegnet ved, at kammeret (28) har en ud i omgivelserne førende åbning (46), der kan lukkes,

idet

åbningen (46) fortrinsvis indeholder en tilbageslagsventil, der lukker ved undertryk i kammeret (28) og åbner ved overtryk i kammeret (28).

5 **8.** Apparat ifølge mindst et af de foregående krav,

kendetegnet ved, at

kammerets (28) væg har et tredie afsnit (24), og det muffeformige legemes (12) væg (14) i dets første endeafsnits (14a) område eller stødende op til dette er fastgjort på det tredie afsnit (24) af kammerets (28) væg.

10

9. Apparat ifølge krav 3 og 8,

kendetegnet ved, at det tredie afsnit (24) af kammerets (28) væg er anbragt mellem dets første afsnit (14a) og dets andet afsnit (26).

15 **10.** Apparat ifølge krav 8 eller 9,

kendetegnet ved, at der på ydersiden af det muffeformige legemes (12) væg (14) i dets første endeafsnits (14a) område eller stødende op til dette er udformet en udadtil fremstående krave (16), der er fastgjort til det tredie afsnit (24) af kammerets (28) væg.

20

11. Apparat ifølge mindst et af de foregående krav

med et hus (4, 6), der optager det muffeformige legeme (12) og slagindretningen (26, 30, 32, 34) og har en første husdel (4) og en på den første husdel (4) aftageligt anbragt andet husdel (6),

25 **kendetegnet ved, at**

den første husdel (4) optager det muffeformige legeme (12) med det andet endeafsnit (14b) af sin væg (14) og er anbragt på den anden husdel (6) i området ved det første endeafsnit (14a) af det muffeformige legemes (12) væg (14) eller stødende op til dets første endeafsnit (14a).

30

12. Apparat ifølge krav 1 eller 2,

i hvilket det muffeformige legemes (12) væg (14) har et mellem det første endeafsnit (14a) og det andet endeafsnit (14b) tilvejebragt mellemafsnit (14c) med vægafsnit, der ligger over for hinanden i en afstand, der
35 definerer et åbningstværsnit af det muffeformige legeme (12),

kendetegnet ved, at

slagindretningen (26, 30, 32, 34) endvidere er udformet til at slå imod mellemafsnittet (14c) af det muffeformige legemes (12) væg (14) med en med tiden foranderlig, især oscillerende anden kraft, der ændrer afstanden mellem de over for hinanden liggende vægafsnit (14cc) af mellemafsnittet (14c) af det muffeformige legemes (12) væg (14), og skiftevis som trykkraft til relativ formindskelse af afstanden mellem de over for hinanden liggende vægafsnit (14cc) og som trækraft til relativ forøgelse af afstanden mellem de over for hinanden liggende vægafsnit (14cc), der uden for det muffeformige legeme (12) og de første kammer (28) er tilvejebragt et andet kammer (42), hvis væg (14) har et første afsnit, der i det mindste delvis dannes af mellemafsnittet (14c) af det muffeformige legemes (12) væg (14), og slagindretningen (26, 30, 32, 34) yderligere er udformet til, for at trykke på mellemafsnittet (14c) af det muffeformige legemes (12) væg (14) med den anden kraft som trykkraft at frembringe et overtryk i det andet kammer (42) og for at trykke på mellemafsnittet (14c) af det muffeformige legemes (12) væg (14) med den anden kraft som trækraft at frembringe et undertryk i det andet kammer (42).

20

13. Apparat ifølge krav 12,

kendetegnet ved, at slagindretningen (26, 30, 32, 34) er udformet til i det væsentlige samtidig at slå imod det første endeafsnit (14a) af det muffeformige legemes (12) væg (14) med den første kraft som trækraft og mellemafsnittet (14c) af det muffeformige legemes (12) væg (14) med den anden kraft som trykkraft og/eller i det væsentlige samtidig at slå imod det første endeafsnit (14a) af det muffeformige legemes (12) væg (14) med den første kraft som trykkraft og mellemafsnittet (14c) af det muffeformige legemes (12) væg (14) med den anden kraft som trækraft.

30

14. Apparat ifølge krav 12 eller 13,

i hvilket det muffeformige legeme (12) har en langstrakt form mellem sin første ende og sin anden ende, og slagindretningen (26, 30, 32, 34) er udformet til at orientere den anden kraft omtrent på tværs af det muffeformige legemes (12) længderetning.

35

15. Apparat ifølge mindst et af kravene 12 til 14,
kendetegnet ved, at forholdet mellem den første kraft og den anden kraft er dimensioneret således, at det af det muffeformige legeme (12) begrænsede
5 hulrums (12a) rumfang i det væsentlige forbliver uforandret.
16. Apparat ifølge et af kravene 12 til 15,
kendetegnet ved, at differensen mellem undertrykket og et normaltryk omtrent svarer til differensen mellem overtrykket og normaltrykket.
- 10 17. Apparat ifølge et af kravene 12 til 16,
kendetegnet ved, at
væggen (14) i det første kammer (28) har et i det mindste delvis fleksibelt
andet afsnit (26),
15 væggen i det andet kammer (42) har et andet afsnit (26), der dannes af
det andet afsnit (26) af væggen i det første kammer (28), og
slagindretningen (26, 30, 32, 34) har en drivindretning (30, 32, 34), der er
udformet til at bevæge det andet afsnit (26) af væggen det første kammer
(28) frem og tilbage mellem en første stilling og en anden stilling,
20 idet
det andet afsnit (26) af væggen i det første kammer (28) fortrinsvis ligger
over for dets første afsnit (14a) og er anbragt fjernt fra dets første afsnit
(14a).
- 25 18. Apparat ifølge krav 14 og 17,
kendetegnet ved, at drivindretningen (30, 32, 34) er udformet til at bevæge det
andet afsnit (26) af væggen (14) i det første kammer (28) omtrent i det
muffeformige legemes (12) længderetning.
- 30 19. Apparat ifølge krav 17 eller 18,
kendetegnet ved, at det andet afsnit (26) af væggen i det første kammer (28)
har en membran.
20. Apparat ifølge mindst et af kravene 12 til 19

med et hus (4, 6), der har en væg (4a, 6a) og optager det muffeformige legeme (12) og slagindretningen (26, 30, 32, 34),

5 **kendetegnet ved, at** væggen i det andet kammer (42) har et tredie afsnit, der befinder sig i afstand fra dets første afsnit (14c) og dannes af et afsnit af husets (4, 6) væg (4a),
idet
det andet endearfsnit (14b) af det muffeformige legemes (12) væg (14) fortrinsvis er fastgjort til husets (4, 6) væg (4a) og især
danner en tætnende lukning af det andet kammer (42) ved husets (4, 6)
10 væg (4a, 6a).

21. Apparat ifølge mindst et af kravene 12 til 20,

kendetegnet ved, at det første kammer (28) har en ud i omgivelserne førende åbning (46), som kan lukkes,
15 som især indeholder en tilbageslagsventil, der lukker ved undertryk i det første kammer (28) og åbner ved overtryk i det første kammer (28).

22. Apparat ifølge mindst et af kravene 12 til 21,

kendetegnet ved, at
20 væggen i det første kammer (28) har et tredie afsnit (24) og det muffeformige legemes (12) væg (14) er fastgjort til det tredie afsnit (24) af væggen i det første kammer (28) i forbindelsesområdet mellem dets første endearfsnit (14a) og dets mellemafsnit (14c).

25 **23.** Apparat ifølge krav 17 og 22,

kendetegnet ved, at det tredie afsnit (24) af væggen i det første kammer (28) er anbragt mellem dets første afsnit (14a) og dets andet afsnit (26).

24. Apparat ifølge krav 22 eller 23,

30 **kendetegnet ved, at** der på ydersiden af det muffeformige legemes (12) væg (14) i forbindelsesområdet mellem dets første endearfsnit (14a) og dets mellemafsnit (14c) er dannet en udadtil fremstående krave (16), der er fastgjort til det tredie afsnit (24) af væggen i det første kammer (28).

25. Apparat ifølge mindst et af kravene 22 til 24,
kendetegnet ved, at væggen i det andet kammer (42) har et fjerde afsnit, der dannes af det tredje afsnit (24) af væggen i det første kammer (28).

5 **26.** Apparat ifølge mindst et af kravene 12 til 25

med et hus (4, 6), der optager det muffeformige legeme (12) og slagindretningen (26, 30, 32, 34) og har en første husdel (4) og en på den første husdel (4) aftageligt anbragt andet husdel (6),

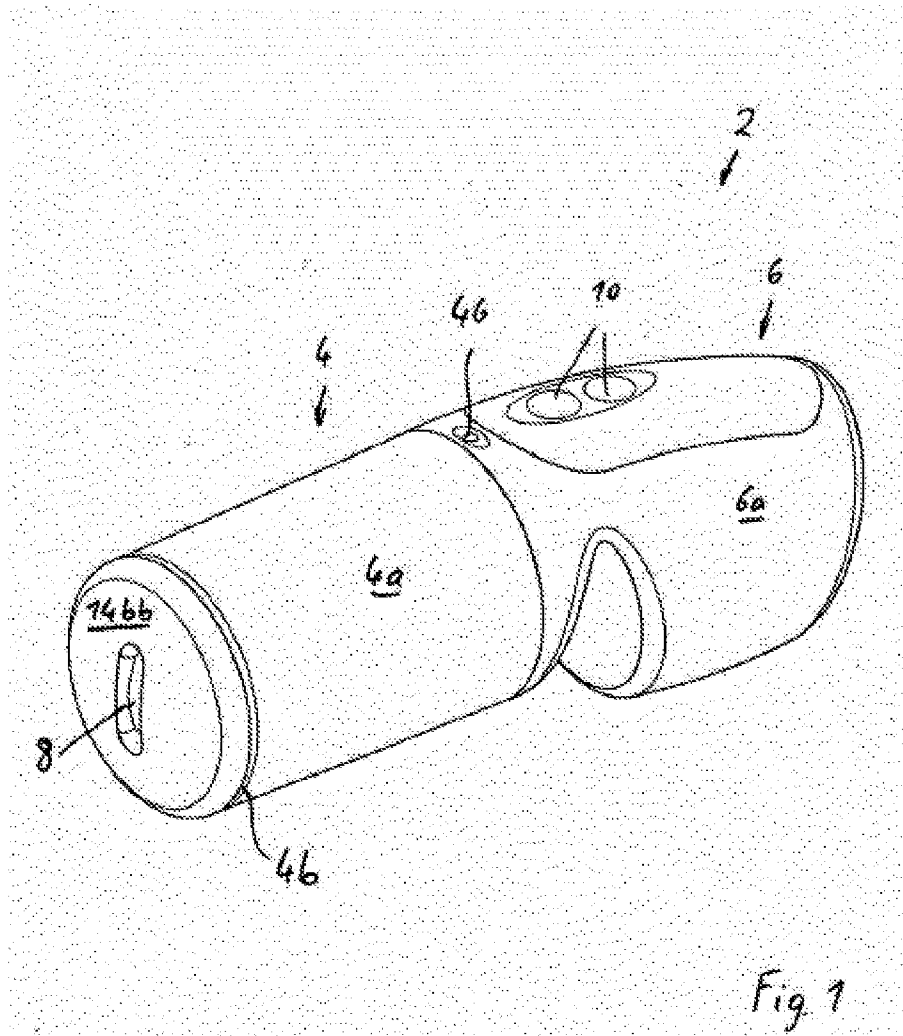
kendetegnet ved, at

10 den første husdel (4) optager det muffeformige legeme (12) i det væsentlige med mellemafsnittet (14c) og det andet endeafsnit (14b) af sin væg (14) og er anbragt på den anden husdel (6) i forbindelsesområdet mellem den første endeafsnit (14a) og mellemafsnittet (14c) af det muffeformige legemes (12) væg (14).

15

27. Apparat ifølge krav 22 og 26,

kendetegnet ved, at den anden husdel (6) er anbragt på den første husdel (4) i området ved det tredje afsnit (24) af væggen i det første kammer (28).



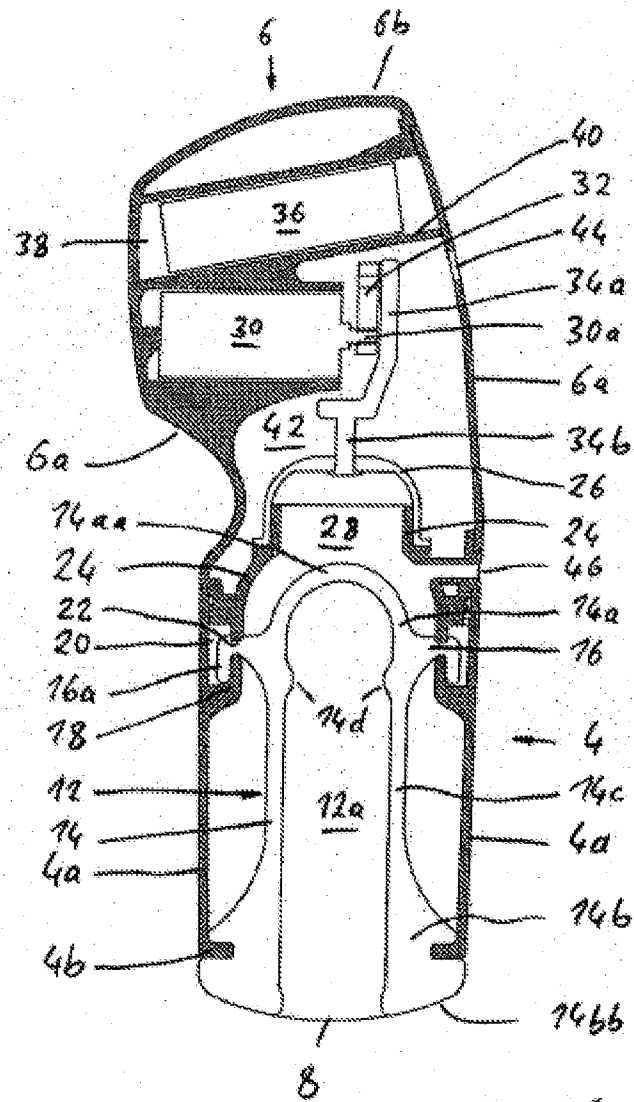
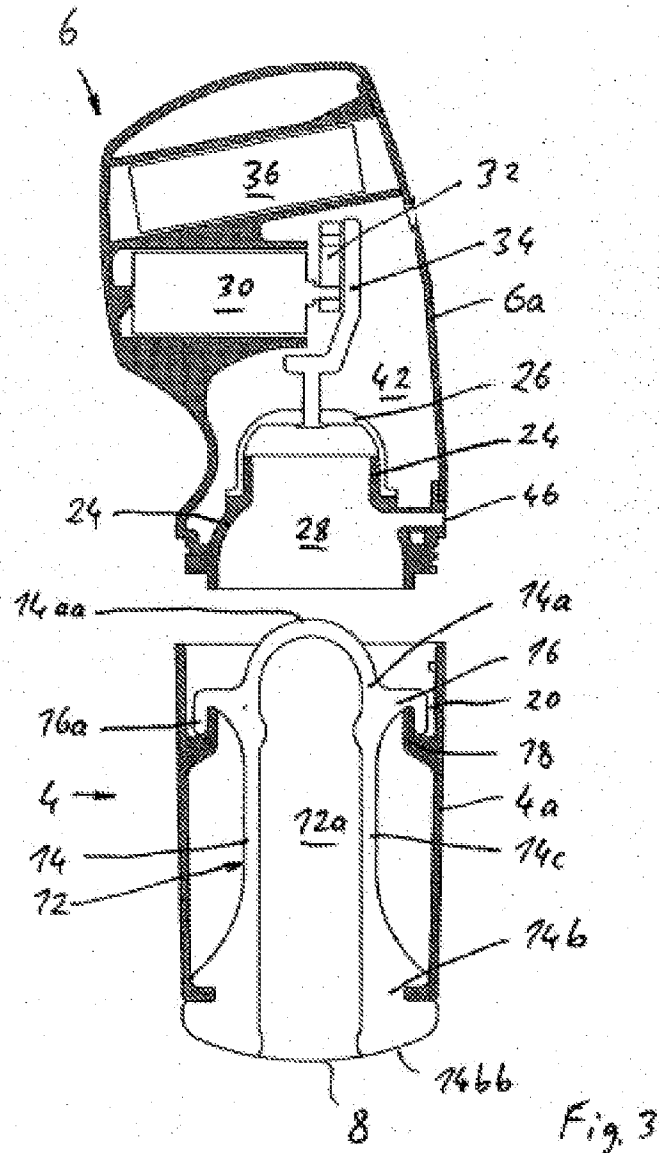


Fig 2.



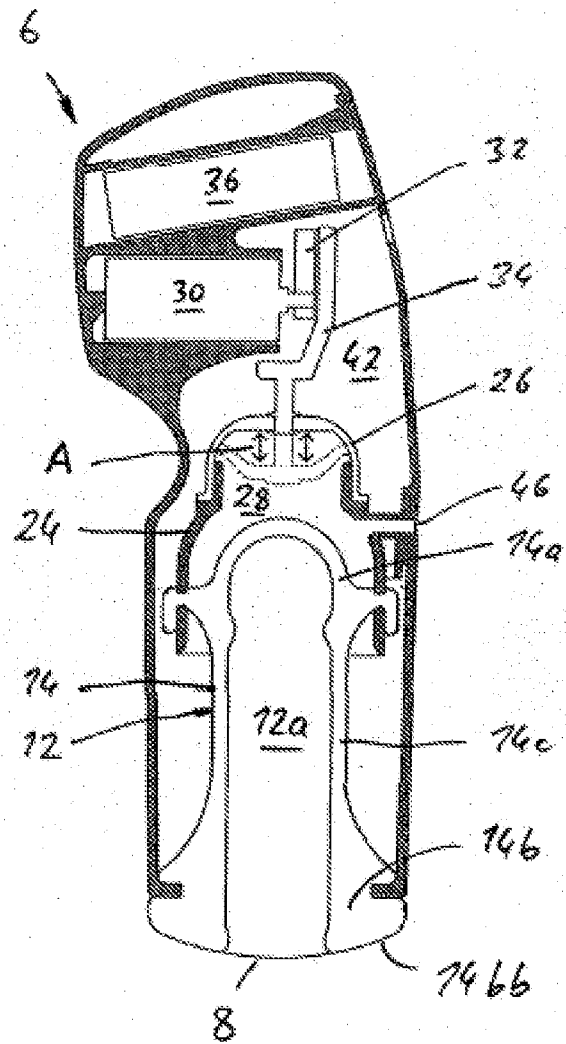


Fig 4

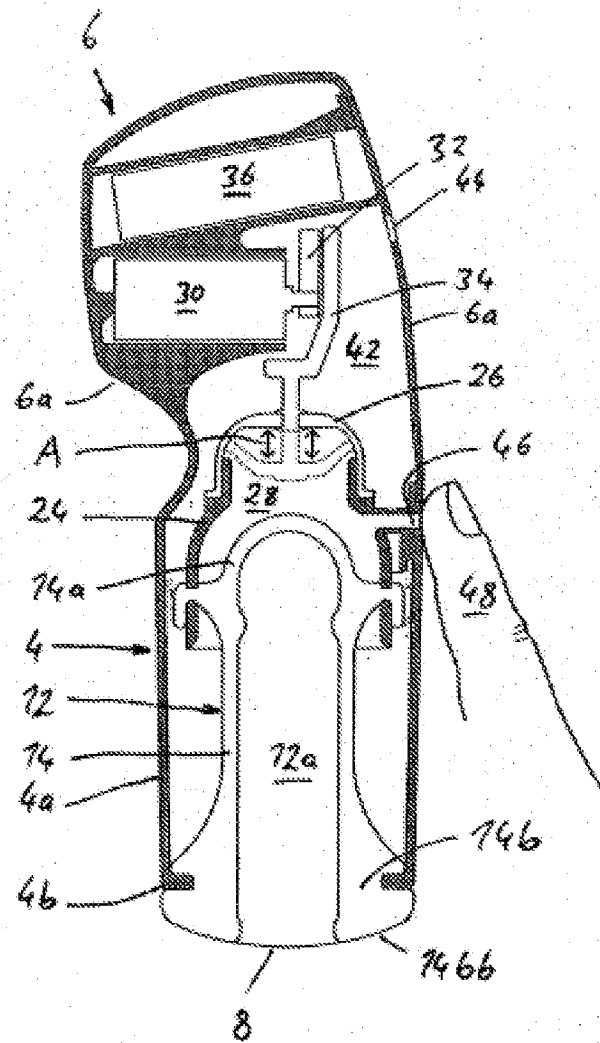


Fig 6

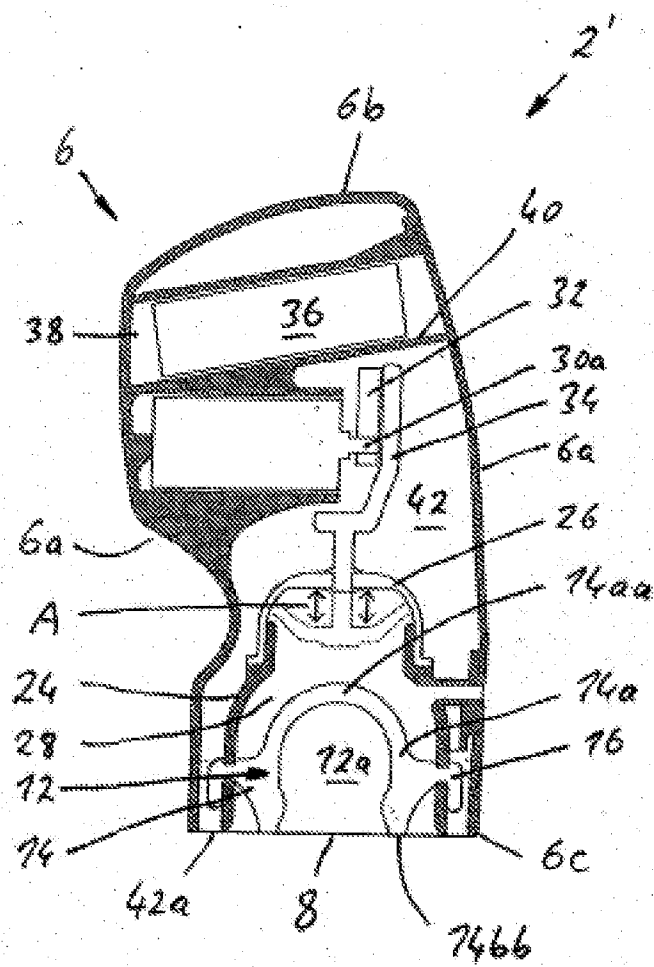


Fig. 7

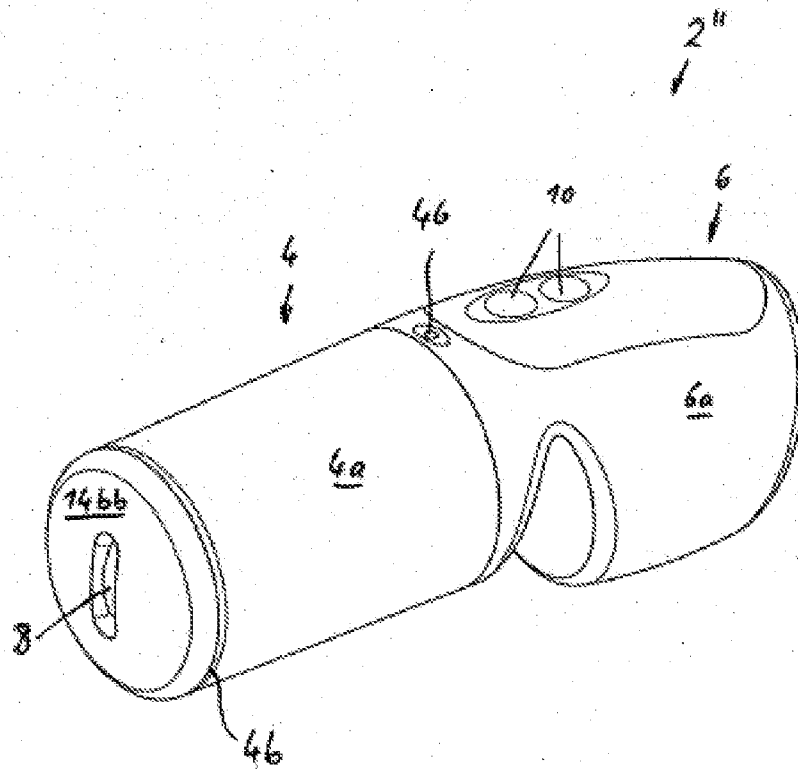


Fig. 8

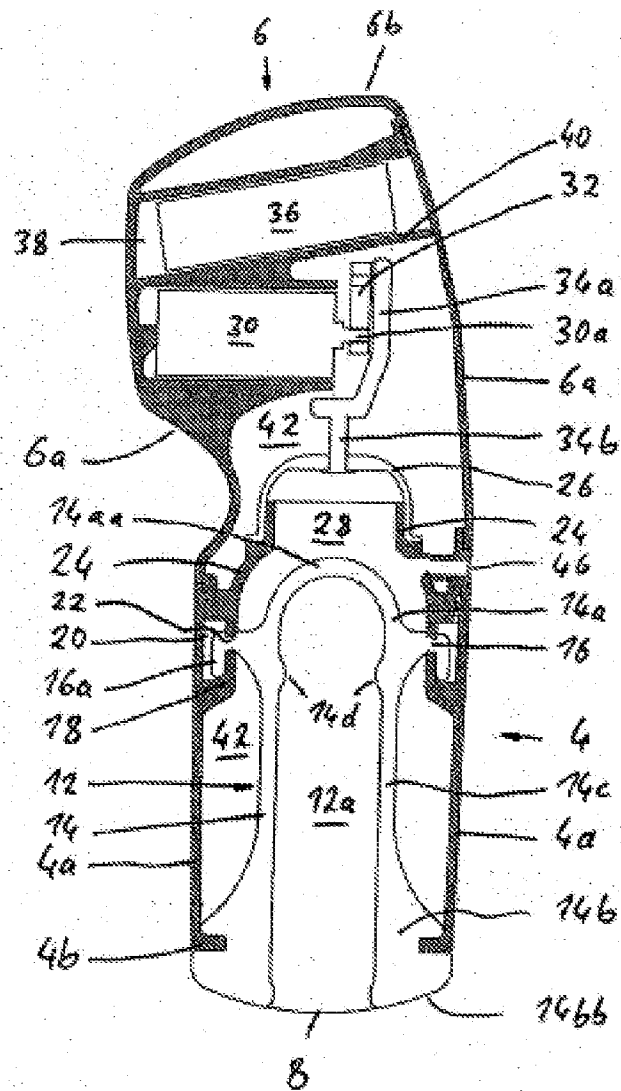


Fig. 9

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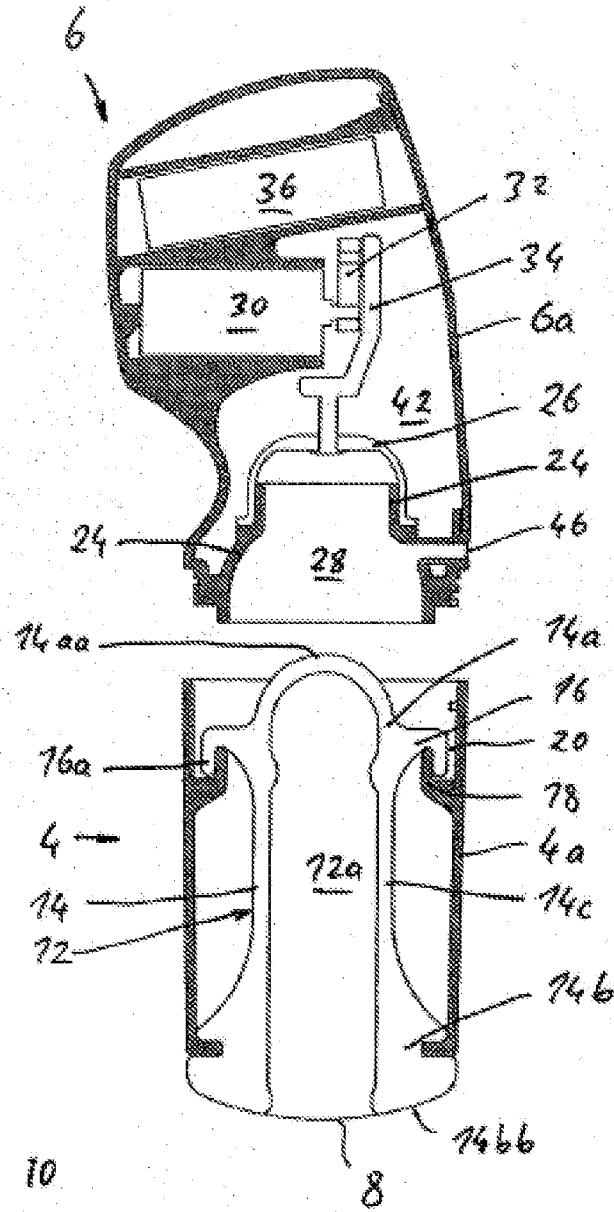


Fig. 10

