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(54) **COMPACT TWEEZER HEAD FOR EPILATION**

KOMPAKTER PINZETTENKOPF ZUR HAARENTFERNUNG

TÊTE DE PINCE COMPACTE POUR ÉPILATION

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EP 3 552 513 B1

Description

FIELD OF THE INVENTION

[0001] The invention relates to a motor-driven epilation head for an epilation device, in particular for plucking hairs of the human skin. The invention furthermore relates to an epilation device. Epilation devices are known from US 2010/076458 A1 and DE10 2004 0874 A1.

BACKGROUND OF THE INVENTION

[0002] Epilation devices serve for removing hairs, if possible including the roots thereof. Known epilation devices are designed in such a way, for example, that the hairs are clamped between adjacent clamping elements and plucked by means of a movement of the clamping elements relative to the skin. This typically requires that the clamping elements are closed in a predetermined position in each case in order to capture the hairs, moved into another predetermined position in a closed state together with the clamped hairs, and then reopened in order to release the plucked hairs. In order to implement this pattern of movement, the clamping elements may be arranged, for example, on a rotation cylinder that is set in rotation by means of an electric motor. The opening and closing of the clamping elements is controlled by means of a control mechanism that can be designed in various ways. Generally, the control mechanism has actuation elements that act on the clamping elements, such that the clamping elements are closed or opened.

[0003] There is one alternative concept for building epilation devices, wherein no actuation means are used. In these devices the epilation cylinder can be provided from a number of disks. The disks are arranged around an axis which generally forms an angle, such that, upon rotation the disks open on the one side and close on the other side. The closing action can be used for plucking hairs. These relatively simple devices can also employ several structures for grasping hair on a single disk. A epilation device of this type is disclosed in EP 1 852 033 A1.

[0004] A rotation cylinder of the type employing actuation elements is known, for example, from EP 547 386 A. The rotation cylinder that is disclosed there for an epilation device is designed in such a way that movable clamping elements are coupled to actuation elements. The clamping elements can be moved toward one another in order to carry out a plucking movement. In the process, one clamping element in each case moves toward a central clamping element from the left and from the right.

[0005] Furthermore, an epilation device is known from EP 1 203 544 A1 in which the actuation elements are designed in the form of rods and arranged around the shaft of the rotation cylinder. All of the rods are coupled to a single return spring in such a way that the clamping elements are pretensioned via the rods in the direction

toward the opened state. In order to close the clamping elements, the rods are actuated in such a way that the clamping elements are displaced in an axial direction by overcoming the spring force of the return spring. These are displaced by the action of the return spring while in the non-actuated state of the rods and the clamping elements are opened as a result.

[0006] The object of the invention is to equip an epilation device with a large number of clamping elements, while keeping the expenditure of time and effort involved in the epilation process reasonable. The invention also aims at attaining as thorough and painless an epilation process as possible. In doing so, the epilation should be effective both on skin with thick hair growth and with sparse hair growth.

[0007] This object is achieved by the combination of features in Claim 1.

SUMMARY OF THE INVENTION

[0008] The invention relates to an epilation head for an epilation device, in particular for plucking hair from human skin having

[0009] The epilation head according to the invention for an epilation device, particularly for plucking hairs of the human skin, has a rotation cylinder capable of rotating about a rotation axis. A multiplicity of plucking gaps is provided on the rotation cylinder for the purpose of plucking hairs. According to the present invention, an epilation head for an epilation device is provided, in particular for epilation head (3) for an epilation device (1), particularly for plucking hair from human skin, having a rotating cylinder (10) rotating around a rotational axis (36) comprising a first plucking unit (16) and a second plucking unit (18), wherein the first plucking unit (16) comprises a first movable clamping unit (20) and a first stationary clamping unit (22) and wherein the second plucking unit (18) comprises a second movable clamping unit (24) and a second stationary clamping unit (26), wherein the movable clamping unit and the stationary clamping unit form a closable plucking gap and wherein the first movable clamping unit (20) and the second movable clamping unit (22) are movable in a direction essentially parallel to the rotational axis (32) and can each be moved from an open position to a closed position with a push rod (40), characterized in that the first movable clamping unit (20) and the second movable clamping unit (22) are provided by a single component (30).

[0010] The invention additionally relates to an epilation device, in particular for plucking hairs of the human skin, comprising a handheld housing and the epilation head according to the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The invention will be explained in further detail by means of the exemplary embodiments shown in the drawings below, in which:

- Fig. 1 shows a side view of an exemplary embodiment of a typical epilation device which, however, is not designed in detail according to the invention,
- Fig. 2 shows a perspective view of a rotation cylinder according to the present invention,
- Fig. 3 shows a perspective view of a components of a rotation cylinder with clamping elements according to the present invention,
- Fig. 4 shows several views of a component useful for the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0012] According to the present invention the epilation head can comprise a first plucking unit and a second plucking unit. Practically, in most cases the epilation head will comprise more than two plucking units, for example at least three, four and five plucking units and up to 20, 30 or 40 plucking units. The plucking units comprise two clamping units which together form a closable plucking gap.

[0013] The plucking gap is closed by moving a movable clamping unit relative to a stationary clamping unit. Therefore, the epilation head will comprise as many movable clamping elements and stationary clamping elements as it comprises plucking units. The movable clamping units are movable in a direction essentially parallel to the rotational axis. Thereby, by rotating the epilation head, a plucking unit can be brought in skin contact and in a synchronized movement, a plucking unit is closed for grasping hair by moving the movable clamping element towards the stationary element.

[0014] The epilation head employs at least one actuation element for moving a movable clamping element from the open position to the closed position. The actuation element can be provided by a push rod. It is useful to associate one push rod with one movable clamping unit. In some embodiments of the present invention it could also be, that one push rod is used for the actuation of the first movable clamping element and the second movable clamping element.

[0015] In accordance with the present invention at least the first movable clamping element and the second movable element are provided by a single component. Providing at least the first movable clamping element and the second movable clamping element by a single component, in one aspect, can be done by providing the two elements from a unitary component. Alternatively, the two clamping elements can be provided from subcomponents which are firmly attached as to provide one component when in use. Such attachment will therefore typically happen in the manufacturing process. The attachment can be by mechanical or chemical means.

[0016] Providing two or more clamping elements in one

single component is associated with several advantages. In one aspect, in the manufacturing process, at least when assembling the epilation head, fewer components are to be handled. In another aspect, the epilation head can be provided in more compact form. The provision of several clamping elements in the form of several components, by contrast, requires that these several components are mechanically supported by appropriate means. These means must allow to, on the one hand, hold the component in place and on the other hand must allow for it to be movable. Achieving both, holding the component in place, and allowing it to move, can be better achieved if two or movable clamping units are provided by the same component.

[0017] It is also useful to have the element arranged at a different distance when seen vertical to the rotational axis. In this regard, it has been found useful that the first movable clamping element is arranged in a first plane vertical to the rotational axis and the second movable clamping element is arranged in a second plane vertical to the movable axis, wherein the two planes are shifted relative to the direction parallel to the rotational axis.

[0018] It is useful to provide the first movable clamping element and the second movable clamping element such they are offset in the direction of rotation. In other words, the first movable clamping element and the second movable clamping element are provided at different positions on the circumference of the rotating cylinder. Hence, the rotational axis appears under a different angle when seen from the first movable clamping element and when seen from the second movable clamping element. The respective angle is herein referred to as offset angle. It is useful that the offset angle is from 10° to 170°, or from 30° to 120°, such that the angular offset is from 10° to 170°, or from 30° to 120°.

[0019] It is also useful to provide a third plucking gap on the epilation head. The third plucking gap can be construed essentially as the first and the second plucking gap. Therefore, the third plucking gap will comprise a third movable clamping element and a third stationary clamping element, wherein the third movable clamping element and the third stationary clamping element form the closable plucking gap and wherein the first third movable clamping element is movable in a direction essentially parallel to the rotational axis and can be moved from an open position to a closed position with an actuation element wherein the third movable clamping element and the second movable clamping element are also provided by a single component. Again, and as generally in the context of the present invention, the actuation element can be provided as a push rod.

[0020] Clearly, it is also useful that the first and the second movable clamping element are provided by a single component. It is also useful, that the first, the second and the third movable clamping element are all provided by a single component. It can be useful to further have a fourth and/or a fifth movable clamping element provided by such a single component.

[0021] It is useful, that also the third clamping element is offset versus the first and/or the second clamping element in at least on direction. It is useful, in particular, that the second movable clamping element and the third movable clamping element are offset in the direction of rotation. Moreover, it is useful that the third movable clamping element lies in a third plane vertical to the rotational axis, the third plane being shifted versus the first plane and the second plane along the rotational axis.

[0022] There is many useful forms and materials for providing the single component, which in turn provides the movable clamping elements. It is useful to provide the single component from metal.

[0023] It is also useful to provide it such that it comprises a central disk. The central disk can be provided with radially extending arms, which in turn provide the movable clamping elements (or are at least comprised by the movable clamping elements). It is useful that the central disk comprises a central duct, which can receive the rotational axis.

[0024] Moreover, it is useful to provide bridge elements between two movable clamping elements. Hence, the bridge elements can be provided between neighboring radially extending arms. These bridge elements increase the mechanical stability of the single component. A portion of the bridge element can also provide a portion of the first or second or third clamping unit.

[0025] It is useful to provide the stationary clamping elements such that there are not movable relatively to the rotational cylinder.

[0026] The movement of the moveable clamping elements can be achieved by providing these elements such that they are movable relative to other parts of the single component. Alternatively or additionally, the single component can be provided such that it is movable as a whole.

[0027] It is useful to provide these stationary clamping elements from plastic. The stationary clamping elements are normally provided as part of the cylindrical role. In particular if the cylindrical role is provided from a multitude of discs, each disc comprising one or more stationary clamping element.

[0028] A number of discs can be placed on an axis, such that the discs form a cylinder. According to the present invention, the single components comprising movable clamping units can be placed between such discs to form the rotating cylinder of the present invention. Hence, a rotating cylinder according to the present invention will comprise a multitude of discs and a multitude of single components comprising movable clamping units. Normally, one component comprising movable clamping units is sandwiched between two discs.

[0029] For low cost easy manufacturing, it is preferred that all discs are of identical shape. This is a particular cost advantage if the discs are formed in a molding process. In accordance with the present invention it is possible to provide an efficient rotating cylinder, comprising discs of only one shape. Often it is beneficial to place the discs on the central axis with different orientation, e.g.

half the discs on the first half of the cylinder, e.g. the left half and half the discs on a second half of the cylinder, e.g. the right half, the dies on the second half being turned by 180° about an axis perpendicular to the central axis of the cylinder.

[0030] While the actuation element can be used to move the movable clamping elements from their closed position to an open position, it is often useful to use the actuation elements only for moving the movable clamping elements to the closed position. Other means can than be provided to move the movable clamping elements to the open position. Useful means are springs. For example a spiral spring can be employed for this purpose.

[0031] Fig. 1 shows a schematic plane view of a typical epilation device 1. The epilation device comprises housing 2 and epilation head 3. The epilation device 1 can be switched on or off using switch for situated in a central position on housing 2. The epilation head 3 encases an epilation cylinder 5 represented by prior art cylinder.

[0032] Fig. 2 shows an epilation cylinder which can be used with an epilation device as shown in Fig. 1. The epilation cylinder 10 comprises side discs 12a and 12b on either side.

[0033] The side discs 12 hold a multitude of discs in place which are stucked to provide, together with the side discs 12, the rotation cylinder 10. The rotation cylinder offers a multitude of plucking gaps for plucking human hair. These plucking gaps comprise first plucking gap 16 and second plucking gap 18.

[0034] Fig. 3 shows a similar view of an epilation cylinder corresponding to epilation cylinder 10 of Fig. 2. However, in Fig. 3 the cylinder is shown with most discs removed, such that only one side disc 12 and one disc 14 are in place.

[0035] As can be seen in Fig. 3, the first plucking gap 16 is provided by first movable clamping element 20 and cooperating first stationary clamping element 22. Likewise, second plucking gap 18 ist provided by second movable clamping element 24 and by second stationary clamping element 26. Moreover third moving clamping element 28 is visible.

[0036] According to the present invention, the first movable clamping element 20, the second movable clamping element 24, and the third movable clamping element 28 are all provided from one single component, component 30. The discs 14 of the rotation cylinder 10 are provided on central axis 32. Also component 30 is provided on this axis 32. Spring 34, also provided on axis 32, is arranged between disc 14 and component 30.

[0037] In operation the epilation cylinder 10 is moved relative to pressure plate 36. This pressure plate comprises a series of cams. Counterpressure is provided by yoke spring 38. This mechanical principal allows to selectively operate push rods, such as push rod 40a and 40b. The respective push rods exert pressure on the movable clamping elements. Push rod 40a can exert pressure on the first movable clamping element 20. Push rod

40b can exert pressure on the second movable clamping element 24. Once the pressure is released and the respective push rods are retracted, spring 34 moves the movable clamping element into their non-plucking or open position. In this position the respective plucking gap is open, meaning the movable clamping element and the stationary clamping element do not touch. In this position hair to be removed can be guided into the respective plucking gaps.

[0038] Fig. 4 shows in view a, perspective view b and further side view c the component providing the movable clamping elements. Component 30 can provide three clamping elements, the first movable clamping element 20, the second movable clamping element 24 and the third movable clamping element 28. Component 30 comprises a central disc 42. Central disc 42 comprises a central duct 44, which can receive axis 32.

[0039] The central disc 42 connects to the different clamping elements by legs 46. To support the feeding of hair to the plucking gaps, the movable clamping elements can comprise guide noses 48, as shown. Each guide nose normally forms an angle with the plucking face of the movable clamping elements.

[0040] As can be seen from view a the different movable clamping elements are arranged on different plans relative to the axis of movement which is parallel with axis 32. The first movable clamping element 20 is arranged on plane E₁ which is offset versus the second movable clamping element 24, which is arranged on second plane E₂. The third movable clamping element 28 is arranged on third plane E₃, which is offset versus the first plane E₁ and the second plane E₂. The direction of this offset is parallel to the direction of rotation.

[0041] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

List of reference signs

[0042]

- 1 epilation device
- 2 housing
- 3 epilation head
- 4 switch
- 5 epilation cylinder (prior art)
- 10 rotation/epilation cylinder
- 12 side disc, flange
- 14 disc
- 16 first plucking gap
- 18 second plucking gap
- 20 first movable clamping element
- 22 first stationary clamping element
- 24 second movable clamping element

- 26 second stationary clamping element
- 28 third movable clamping element
- 30 component
- 32 axis
- 5 34 spring
- 36 pressure plate
- 38 yoke spring
- 40 push rod
- 42 disc
- 10 44 duct
- 46 leg
- 48 guide nose
- E1 first plane
- E2 second plane
- 15 E3 third plane

Claims

- 20 1. An epilation head (3) for an epilation device (1) particularly for plucking hair from human skin, having a rotating cylinder (10) rotating around a rotational axis (36) comprising a first plucking unit (16) and a second plucking unit (18), wherein the first plucking unit (16) comprises a first movable clamping unit (20) and a first stationary clamping unit (22) and wherein the second plucking unit (18) comprises a second movable clamping unit (24) and a second stationary clamping unit (26), wherein the movable clamping unit and the stationary clamping unit form a closable plucking gap and wherein the first movable clamping unit (20) and the second movable clamping unit (22) are movable in a direction essentially parallel to the rotational axis (32) and can each be moved from an open position to a closed position with a push rod (40), **characterized in that** the first movable clamping unit (20) and the second movable clamping unit (22) are provided by a single component (30) and wherein the first movable clamping unit (20) is arranged in a first plane vertical to the rotational axis and the second movable clamping element (26) is arranged in a second plane vertical to the rotational axis, wherein the second plane is shifted relative to the first plane in a direction parallel to the rotational axis.
- 45 2. The epilation head (3) according to Claim 1, in which the first movable clamping element (20) and the second movable clamping element (22) are offset in the direction of rotation.
- 50 3. The epilation head (3) according to any one of the preceding claims, in which further comprises a third plucking gap, comprising a third movable clamping element (28) and a third stationary clamping element, wherein the third movable clamping unit and the third stationary clamping unit form a closable plucking gap and wherein the third movable clamp-
- 55

ing element (28) is movable in a direction essentially parallel to the rotational axis (32) and can be moved from an open position to a closed position with a push rod (40) and wherein the third movable clamping element (28) and the second movable clamping element (22) are also provided by a single component (30).

4. Epilation head (3) according to claim 3, wherein the third movable clamping element (28) lies in a third plane vertical to the rotational axis, the third plane being shifted versus the first plane and the second plane along the rotational axis (32).
5. Epilation head (3) according to any one of the preceding claims, wherein the single component comprises a central duct (44), which can receive the rotational axis (32).
6. Epilation head (3) according to any one of the preceding claims, wherein the single component is made of metal.
7. Epilation head (3) according to any one of the preceding claims, wherein the single component comprises a central plate and wherein the movable clamping units are provided as readily extending legs (46).
8. Epilation head (3) according to the preceding claims, wherein a bridge element is provided between at least two movable clamping elements.
9. Epilation head (3) according to any one of the preceding claims, in which the stationary counter elements are not movable relative to the rotational cylinder.
10. Epilation head (3) according to any one of the preceding claims, wherein the stationary clamping elements are provided from plastic.
11. Epilation head (3) according to any one of the preceding claims, in which the movable clamping units can be moved from the closed position to an open position by a spring (34).
12. Epilation device (1) comprising an epilation head (3) which is attached to a housing and which can be motor operated and which comprises an epilation head (10) according to any one of the preceding claims.

Patentansprüche

1. Epilationskopf (3) für ein Epilationsgerät (1), insbesondere zum Auszupfen von Haaren aus menschi-

cher Haut, mit einem sich um eine Drehachse (36) drehenden Drehzylinder (10), der eine erste Zupfeinheit (16) und eine zweite Zupfeinheit (18) aufweist, wobei die erste Zupfeinheit (16) eine erste bewegliche Klemmeinheit (20) und eine erste stationäre Klemmeinheit (22) umfasst und wobei die zweite Zupfeinheit (18) eine zweite bewegliche Klemmeinheit (24) und eine zweite stationäre Klemmeinheit (26) umfasst, wobei die bewegliche Klemmeinheit und die stationäre Klemmeinheit einen verschließbaren Zupfspalt bilden und wobei die erste bewegliche Klemmeinheit (20) und die zweite bewegliche Klemmeinheit (22) in einer Richtung im Wesentlichen parallel zu der Drehachse (32) beweglich sind und jeweils mit einer Schubstange (40) von einer offenen Position in eine geschlossene Position bewegt werden können, **dadurch gekennzeichnet, dass** die erste bewegliche Klemmeinheit (20) und die zweite bewegliche Klemmeinheit (22) durch ein einziges Bauteil (30) bereitgestellt werden und wobei die erste bewegliche Klemmeinheit (20) in einer ersten Ebene senkrecht zur Drehachse und das zweite bewegliche Klemmelement (26) in einer zweiten Ebene senkrecht zur Drehachse angeordnet ist, wobei die zweite Ebene in Bezug zu der ersten Ebene in einer Richtung parallel zu der Drehachse verschoben ist.

2. Epilationskopf (3) nach Anspruch 1, wobei das erste bewegliche Klemmelement (20) und das zweite bewegliche Klemmelement (22) in der Drehrichtung versetzt sind.
3. Epilationskopf (3) nach einem der vorstehenden Ansprüche, der ferner einen dritten Zupfspalt umfasst, der ein drittes bewegliches Klemmelement (28) und ein drittes stationäres Klemmelement umfasst, wobei die dritte bewegliche Klemmeinheit und die dritte stationäre Klemmeinheit einen verschließbaren Zupfspalt bilden und wobei das dritte bewegliche Klemmelement (28) in einer Richtung im Wesentlichen parallel zur Drehachse (32) verbunden ist und mit einer Schubstange (40) von einer offenen Position in eine geschlossene Position bewegt werden kann und wobei das dritte bewegliche Klemmelement (28) und das zweite bewegliche Klemmelement (22) ebenfalls durch ein einziges Bauteil (30) bereitgestellt werden.
4. Epilationskopf (3) nach Anspruch 3, wobei das dritte bewegliche Klemmelement (28) in einer dritten Ebene senkrecht zur Drehachse liegt, wobei die dritte Ebene gegenüber der ersten Ebene und der zweiten Ebene entlang der Drehachse (32) verschoben ist.
5. Epilationskopf (3) nach einem der vorstehenden Ansprüche, wobei die einzelne Komponente einen zentralen Kanal (44) umfasst, der die Drehachse (32)

aufnehmen kann.

6. Epilationskopf (3) nach einem der vorstehenden Ansprüche, wobei die einzelne Komponente aus Metall hergestellt ist. 5
7. Epilationskopf (3) nach einem der vorstehenden Ansprüche, wobei die einzelne Komponente eine zentrale Platte umfasst und wobei die beweglichen Klemmeinheiten als sich leicht erstreckende Schenkel (46) bereitgestellt sind. 10
8. Epilationskopf (3) nach den vorstehenden Ansprüchen, wobei ein Brückenelement zwischen mindestens zwei beweglichen Klemmelementen bereitgestellt ist. 15
9. Epilationskopf (3) nach einem der vorstehenden Ansprüche, wobei die stationären Gegenelemente in Bezug zu dem Drehzylinder nicht beweglich sind. 20
10. Epilationskopf (3) nach einem der vorangehenden Ansprüche, bei dem die stationären Klemmelemente aus Kunststoff hergestellt sind. 25
11. Epilationskopf (3) nach einem der vorstehenden Ansprüche, wobei die beweglichen Klemmeinheiten durch eine Feder (34) aus der geschlossenen Position in eine offene Position bewegt werden können. 30
12. Epilationsgerät (1), das einen Epilationskopf (3) umfasst, der an einem Gehäuse befestigt ist und der motorisch betrieben werden kann und der einen Epilationskopf (10) nach einem der vorstehenden Ansprüche umfasst. 35

Revendications

1. Tête d'épilation (3) pour un dispositif d'épilation (1) particulièrement pour arracher les poils de la peau humaine, ayant un cylindre rotatif (10) tournant autour d'un axe de rotation (36) comprenant une première unité d'arrachage (16) et une deuxième unité d'arrachage (18), dans laquelle la première unité d'arrachage (16) comprend une première unité de serrage mobile (20) et une première unité de serrage stationnaire (22) et dans laquelle la deuxième unité d'arrachage (18) comprend une deuxième unité de serrage mobile (24) et une deuxième unité de serrage stationnaire (26), dans laquelle l'unité de serrage mobile et l'unité de serrage stationnaire forment un espace d'arrachage fermable et dans laquelle la première unité de serrage mobile (20) et la deuxième unité de serrage mobile (22) sont mobiles dans une direction sensiblement parallèle à l'axe de rotation (32) et peuvent chacune être déplacées d'une position ouverte à une position fermée avec une tige 40

poussoir (40), **caractérisée en ce que** la première unité de serrage mobile (20) et la deuxième unité de serrage mobile (22) sont fournies par un composant unique (30) et dans laquelle la première unité de serrage mobile (20) est agencée dans un premier plan vertical par rapport à l'axe de rotation et le deuxième élément de serrage mobile (26) est agencé dans un deuxième plan vertical par rapport à l'axe de rotation, dans laquelle le deuxième plan est décalé par rapport au premier plan dans une direction parallèle à l'axe de rotation.

2. Tête d'épilation (3) selon la revendication 1, dans laquelle le premier élément de serrage mobile (20) et le deuxième élément de serrage mobile (22) sont décalés dans la direction de rotation.
3. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle elle comprend en outre un troisième espace d'arrachage, comprenant un troisième élément de serrage mobile (28) et un troisième élément de serrage stationnaire, dans laquelle la troisième unité de serrage mobile et la troisième unité de serrage stationnaire forment un espace d'arrachage fermable et dans laquelle le troisième élément de serrage mobile (28) est mobile dans une direction sensiblement parallèle à l'axe de rotation (32) et peut être déplacé d'une position ouverte à une position fermée avec une tige poussoir (40) et dans laquelle le troisième élément de serrage mobile (28) et le deuxième élément de serrage mobile (22) sont également fournis par un composant unique (30).
4. Tête d'épilation (3) selon la revendication 3, dans laquelle le troisième élément de serrage mobile (28) se trouve dans un troisième plan vertical par rapport à l'axe de rotation, le troisième plan étant décalé comparativement au premier plan et au deuxième plan le long de l'axe de rotation (32).
5. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle le composant unique comprend un conduit central (44), qui peut recevoir l'axe de rotation (32).
6. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle le composant unique est constitué de métal.
7. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle le composant unique comprend une plaque centrale et dans laquelle les unités de serrage mobiles sont fournies en tant que pattes s'étendant aisément (46).
8. Tête d'épilation (3) selon les revendications précédentes, dans laquelle un élément de pont est fourni

entre au moins deux éléments de serrage mobiles.

9. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle les contre-éléments stationnaires ne sont pas mobiles par rapport au cylindre de rotation. 5
10. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle les éléments de serrage stationnaires sont fournis à partir de matières plastiques. 10
11. Tête d'épilation (3) selon l'une quelconque des revendications précédentes, dans laquelle les unités de serrage mobiles peuvent être déplacées de la position fermée à une position ouverte par un ressort (34). 15
12. Dispositif d'épilation (1) comprenant une tête d'épilation (3) qui est fixée à un logement et qui peut être actionné par moteur et qui comprend une tête d'épilation (10) selon l'une quelconque des revendications précédentes. 20

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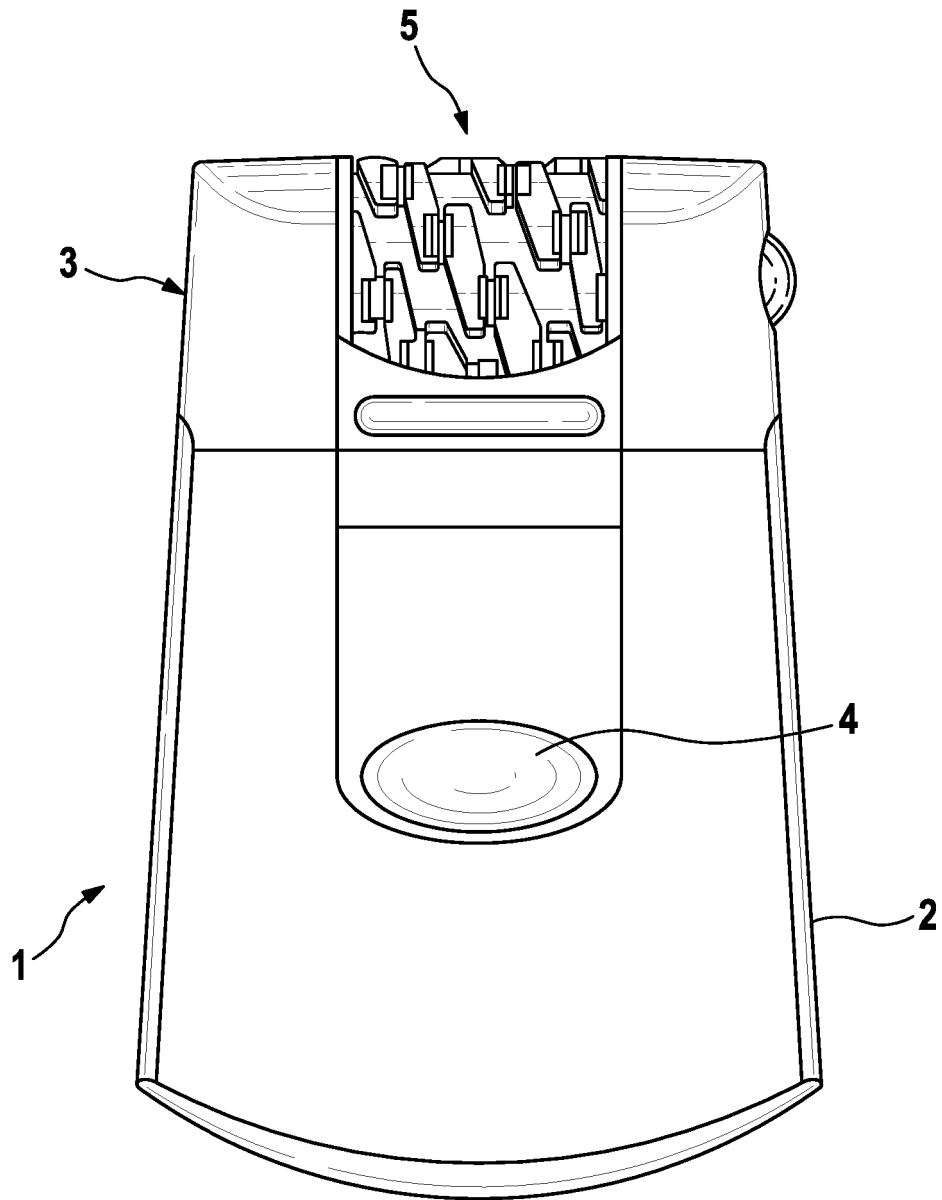


Fig. 1

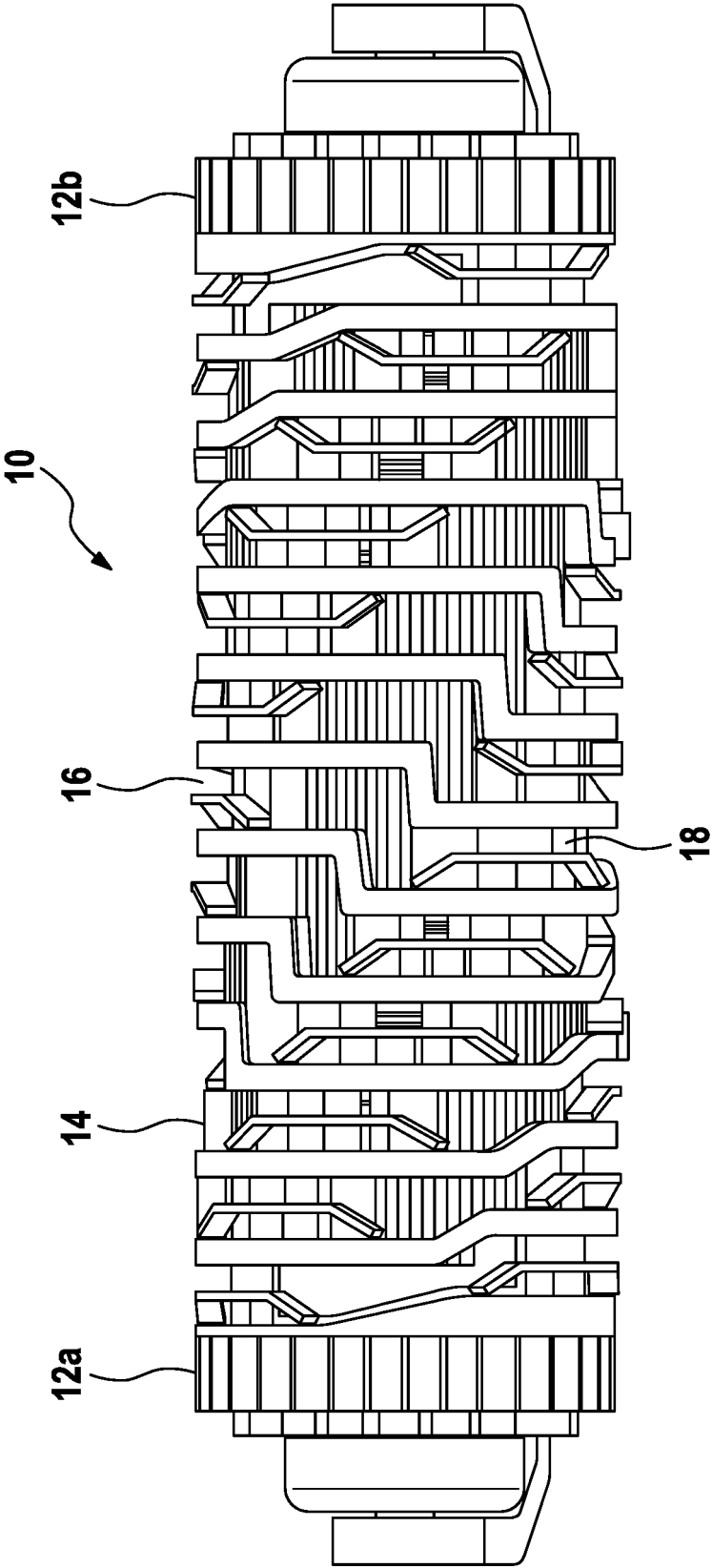


Fig. 2

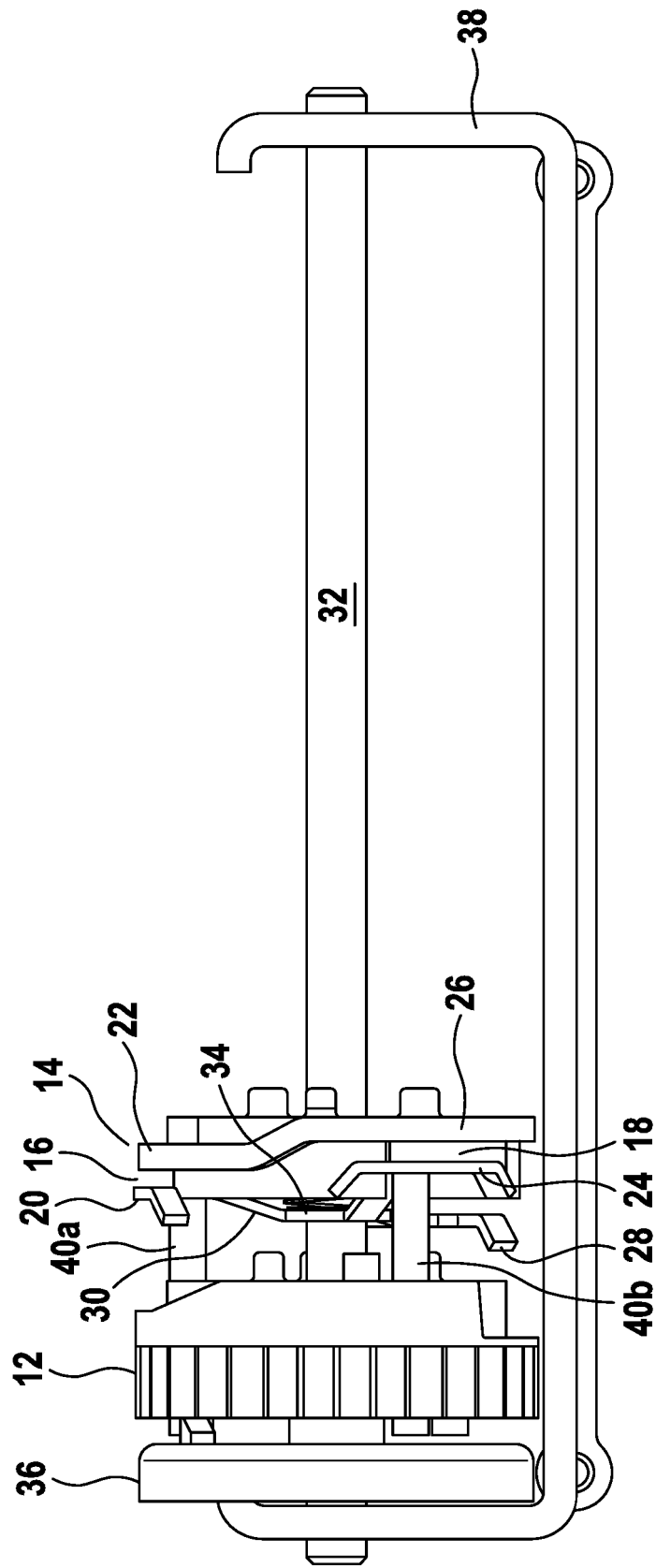
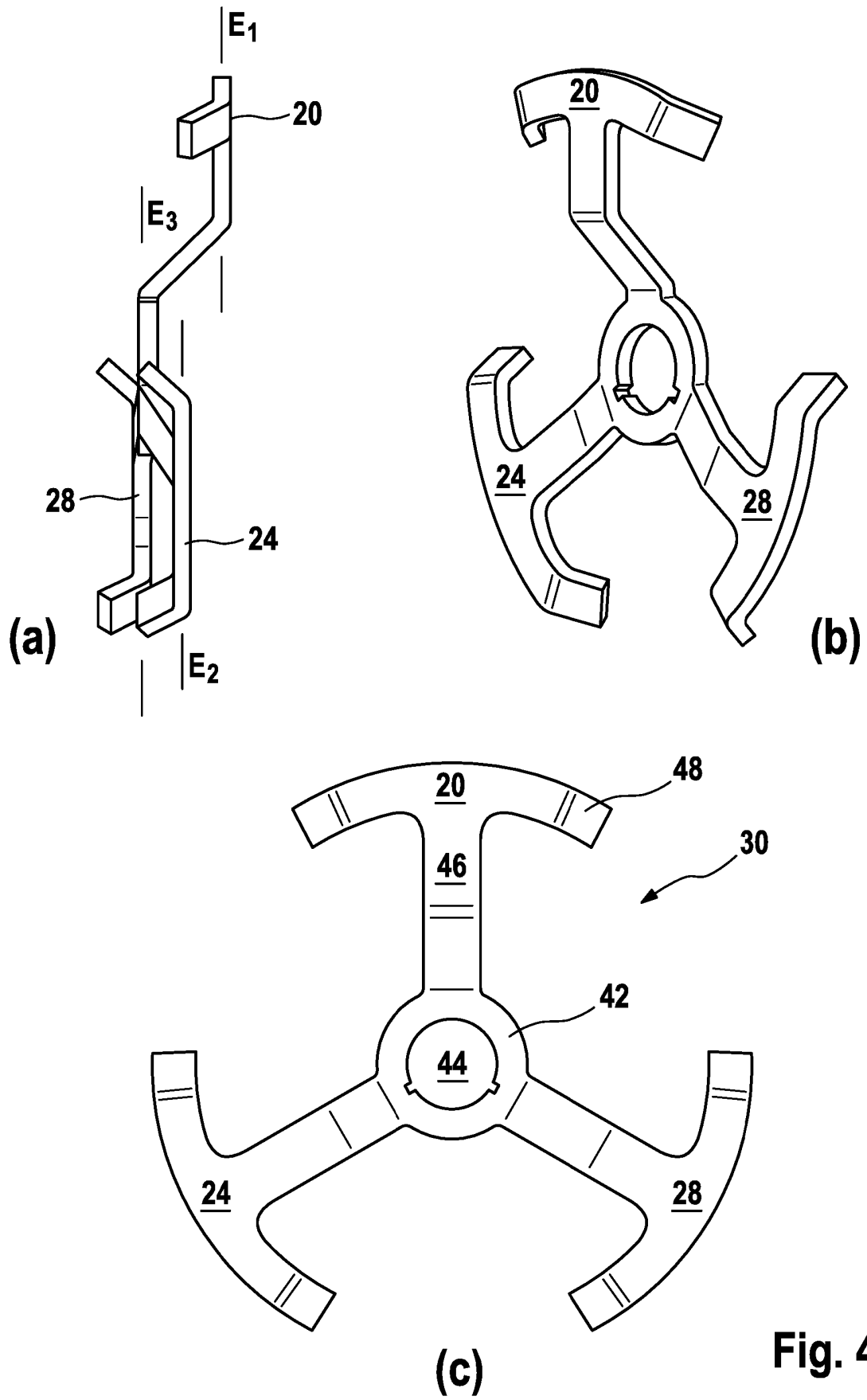


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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