



Europäisches Patentamt
European Patent Office
Office européen des brevets



0 264 851 B1

Publication number:

EUROPEAN PATENT SPECIFICATION

- (45) Date of publication of patent specification: **13.04.94** (51) Int. Cl.⁵: **A61H 9/00**
(21) Application number: **87115164.3**
(22) Date of filing: **16.10.87**

(54) **Vacuum skin cleaner.**

- (30) Priority: **18.10.86 JP 247850/86**
(43) Date of publication of application:
27.04.88 Bulletin 88/17
(45) Publication of the grant of the patent:
13.04.94 Bulletin 94/15
(64) Designated Contracting States:
AT BE CH DE ES FR GB IT LI LU NL SE
(56) References cited:
CH-A- 286 671
GB-A- 274 107

- (73) Proprietor: **AZZ INTERNATIONAL CO., LTD.**
Mido Urban-Life No. 711
55-1, Kawaramachi 5-chome
Higashi-ku Osaka(JP)
(72) Inventor: **Yamamoto, Masuo**
205-228, No
Habikino-shi
Osaka(JP)
(74) Representative: **Reinhard, Skuhra, Weise**
Postfach 44 01 51
D-80750 München (DE)

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

The invention relates to a vacuum skin cleaner according to the head portion of claim 1. Such vacuum skin cleaner is provided for sucking out various wastes, such as metabolic wastes, cosmetic residues, dust etc., accumulated within the human skin pores.

As is well known, it is required not only to remove an aged horny layer but also to enhance metabolism for producing a new horny layer and to improve secretion of sebum, in order to always maintain the human skin in good condition. Particularly, the sebum, which is secreted through the skin pores, is known to be superior in skin protection and refinement to any artificial skin conditioners.

During daily life or as a result of makeup, various wastes, such as metabolic wastes, cosmetic residues, dust and so on, may accumulate in and clog up the skin pores to impede sebum secretion. Further, such wastes can also hinder skin respiration (dermal respiration) to reduce metabolism in addition to causing annoying pimples, blackheads and rashes. In view of skin care, it is thus absolutely necessary to remove the pore clogging wastes by some method.

Face washing with known face cleansers is considered very effective in temporarily keeping the face clean. However, such face washing is insufficient in that it fails to remove various wastes which have already accumulated in the skin pores. Further, the face cleansers have a vital disadvantage of washing away the secreted sebum itself.

A vacuum skin cleaner has become commercially available which comprises a negative pressure generator connected to an applicator cap. The negative pressure generator incorporates a vacuum pump driven by an electric motor.

In operation, the applicator cap which is put under vacuum is pressed against the human skin to forcibly suck out pore clogging wastes and to simulate the skin for enhancing metabolism. Such suction cleaning is now widely adopted particularly in beauty parlors or salons.

However, since the conventional vacuum skin cleaner operates electrically, it is disadvantageous in the following four respects.

In the first place, the conventional cleaner is not operable safely where water is used because the user may receive an accidental electric shock. This means that suction skin cleaning cannot be conducted during or immediately after washing the face or taking a bath. The electric cleaner, even if completely sealed against water, will still have a problem of short service life in addition to involving a high production cost.

In fact, suction cleaning can be done easily when the skin is wet with water for smooth contact

with the applicator cap. Particularly, when the skin is warm as a result of taking a bath, the skin pores become fully open to facilitate waste removal. However, it is impossible to use the conventional cleaner at such an appropriate time.

In the second place, the electric vacuum skin cleaner provides poor adjustability of the suction force obtained. More specifically, the electric motor driving the cleaner provides only a "ON" or "OFF" state or at most stepwise suction adjustment (e.g. "LOW" and "HIGH"). Thus, it is impossible with the conventional cleaner to achieve minute suction adjustment depending on various requirements (e.g. particular condition or portion of the skin, user's taste, etc.).

In the third place, it is difficult with the conventional cleaner to wash away the wastes which have collected on the applicator cap and/or in the suction passage. Thus, the cleaner may get unacceptably dirty or sometimes inoperative due to clogging up of the suction passage after repeated use.

Finally, it is uncomfortable to use the conventional cleaner because of motor vibration and noises.

A vacuum skin cleaner comprising a negative pressure generator, an applicator cap, a grip member and a closable vacuum relief port in accordance with the preamble of claim 1 is known from CH-A-286671. The vacuum relief port of said design opens into the interior of the space of the grip and is closable indirectly by a spring-biased lever. This lever is used only to select between the open and closed conditions of the vacuum relief port for full interruption or full application of the vacuum developed within the applicator cap.

Therefore, it is an object of the invention to provide a vacuum skin cleaner for improved handling and steplessly adjusting suction force.

This object is obtained by the features of the characterizing portion of claim 1. Further advantageous embodiments are described in subclaims 2 to 12, respectively.

The claimed invention is advantageous in that not only the vacuum within the applicator cap is immediately interrupted and restored by using the vacuum relief port, but also the vacuum within the applicator can be steplessly adjusted by partially uncovering or opening the vacuum relief port to various degrees. This provides a very convenient handling, and advantageously enables the utilization of said vacuum relief port for stepless adjustment also at different rates of water flow from said tap water faucet, thus increasing the overall adjustable range.

The invention will now be described further, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a view in vertical section of a vacuum skin cleaner embodying the invention;

Figure 2 is a sectional view taken on lines II-II in Figure 1;

Figure 3 is a plan view showing an example of an applicator cap;

Figure 4 is a view in vertical section of another vacuum skin cleaner embodying the invention;

Figure 5 is a perspective view of still another vacuum skin cleaner embodying the invention; and

Figure 6 is a sectional view taken on lines VI-VI in Figure 5.

Throughout the accompanying drawings, like parts are referred to by the same reference numerals and characters to avoid duplication of explanation.

Referring now to Figure 1 of the accompanying drawings, a vacuum skin cleaner according to a first embodiment of the invention comprises a mounting attachment 2 detachably connected to a tap water faucet 1, and a negative pressure generator 3 which in turn is detachably connected to the attachment 2.

The mounting attachment 2 includes an upper member 4 connectable to the faucet 1. More specifically, the upper member 4 has an enlarged ring portion 4a surrounding the discharge end of the faucet 1, and a cylindrical screw portion 4b extending downward from the ring portion 4a and formed with external threads 7. A plurality (e.g. four) of equiangularly spaced set screws 6 extend radially inward through the ring portion 4a into contact with the faucet discharge end for fixing the upper member 4 to the faucet 1. The screw portion 4b internally supports a sealing ring plate 8 below the faucet discharge end.

It should be appreciated that the upper member 4 can be fixed to a faucet discharge end of any cross section by independently advancing the set screws 6 into contact with the faucet discharge end.

The attachment 2 further includes a lower member 5 screwed to the upper member 4. More particularly, the lower member 5 has a cylindrical screw portion 5a which is formed with internal threads 9 for screw engagement with the screw portion 4b of the upper member 4, and a cylindrical connector portion 5c which is smaller in diameter than the screw portion 5a and extends downward therefrom for connection to the negative pressure generator 3.

The connector portion 5c has, as an integral upward extension thereof, a seal pressing portion 5b which is smaller in diameter than the cylindrical screw portion 4b of the upper member 4. Thus, upon screwing of the lower member 5 onto the upper member 4, the seal pressing portion 5b

presses the sealing ring plate 8 against the discharge end of the faucet 1 to provide water-tightness for the attachment 2 itself and for the connection between the faucet 1 and the attachment 2.

Further, the connector portion 5c is formed with an integral annular projection 10 and a annular groove 11a below the annular projection 10 for receiving an annular seal ring 11.

The negative pressure generator 3 internally defines a water passage 12 and has an upper cylindrical fitting portion 3a which is releasably mounted to the connector portion 5c of the lower attachment member 5 by means of a lock mechanism 13.

As best illustrated in Figure 2, the lock mechanism 13 comprises a pair of semicircular stopper segments 14 which together form a substantially annular body and are urged toward each other by a pair of springs 13a. Each stopper segment 14 has end faces 14a which are opposed to and spaced from the corresponding end faces 14a of the other stopper segment 14 to define a pair of V-shaped gaps. Both stopper segments 14 respectively have upper inner circumferential edges 14b which are chamfered to form, in combination, a substantially conical surface.

The lock mechanism 13 further includes a pair of release buttons 13b which radially extend through the cylindrical fitting portion 3a of the negative pressure generator 3 at a pair of diametrically opposite positions thereof. Each button 13b has a wedge head 13c which fits into a correspondingly V-shaped gap between the two stopper segments 14. Thus, when the buttons 13b are advanced by finger pressure, the stopper segments 14 are forcibly moved away from each other against the urging force of the springs 13a due to wedging effect between the tapered head 13c of the button 13b and the gap forming end faces 14a of the stopper segments 14. When the buttons 13b are freed from pressure, on the other hand, the stopper segments 14 are automatically displaced toward each other by the restoring force of the springs 13a with the resultant retraction of the buttons 13b. The retracting movement of each button 13b is restrained by a pin 13d which fits in an elongated slot 13e formed in the button 13b.

For mounting the negative pressure generator 3 to the attachment 2, the upper cylindrical portion 3a of the generator 3 is forcibly fitted from below onto the connector portion 5c of the attachment lower member 5. Upon contact of the stopper segments 14 with the annular projection 10 of the attachment lower member 5, the chamfered edges 14b of the stopper segments 14 function to move the segments 14 away from each other against the biasing force of the springs 13a, thereby permitting the segments 14 to ride over and engage with the

annular projection 10. At this time, the seal ring 11 comes into sealing contact with the inner circumferential surface of the upper cylindrical portion 3a to provide water-tightness between the attachment 2 and the negative pressure generator 3.

For removing the generator 3 from the attachment 2, the release buttons 13b are pushed to move the stopper segments 14 away from each other, and the generator 3 is pulled downward.

The water passage 12 formed within the negative pressure generator 3 is provided in the form of a well known venturi the diameter of which increases progressively in opposite directions from its smallest diameter portion or throat 12a. The venturi passage 12 is formed at the smallest diameter portion 12 with an annular slit 12b which communicates with a laterally extending suction nose 15 having an inlet connection end 15a.

According to the preferred embodiment illustrated in Figure 1, the venturi passage 12 is provided at its inlet end with a flow rectifying member 16 which has a plurality (only one shown) of inclined through-bores 16a. The rectifying member 16 imparts a whirling motion to the flowing water to maximize vacuum production at the smallest diameter portion 12a. Obviously, the rectifying member 16 may be modified to have a plurality of screw blades (not shown) instead of the inclined through-bores 16a.

The inlet end 15a of the suction nose 15 is connected to an outlet end 18a of a grip member 18 by a flexible hose 17. The grip member 18 has an air passage 18b extending therethrough and is formed at its inlet end with a tapered mounting hole 20. The grip member 18 is further provided with a vacuum relief port 21 which communicates with an intermediate portion of the air passage 18b.

The grip member 18 has such a shape as to provide ready gripping and is used to exchangeably mount an applicator cap 19 having an opening mouth 19a for contact with the human skin. More specifically, the cap 19 has a tapered projection 19b which is fitted into the tapered mounting hole 20 of the grip member 18.

According to the example illustrated in Figure 3, the opening mouth 19a of the cap 19 is oval for facilitated application to portions of the human skin around the nose for example. However, the cap 19 may be replaced by another which is differently dimensioned and shaped depending on a particular portion or portions of the human skin to which it is applied. It should be noted in this connection that a suction force per unit area does not vary despite a change in the overall area of the cap mouth 19a.

The negative generator 3 has a water discharge end 3b which is connected via a flexible hose 22 to a projecting base portion 23a of a washing attachment 23 which, according to the

example illustrated in Figure 1, is in the form of a cone. The conical washing attachment 23 defines a water outlet opening 24. It should be noted that the washing attachment 23 is connected to a discharge end 22a of the hose 22 only at the time of an washing operation to be described later but not at the time of suction cleaning.

In operation, the faucet 1 is turned on to supply tap water which flows through the flow rectifying member 16 and then through the venturi passage 12 to ultimately discharge through the hose 22 with the washing attachment 23 detached. Upon passage through the venturi throat 12a, the water flows at a maximum speed to develop a maximum dynamic pressure while providing a medium static pressure according to the Bernoulli law. Since the static pressure at the discharge end 22a of the hose 22 is equal to an atmospheric pressure (zero gauge pressure), the static pressure at the venturi throat 12a becomes negative.

A user grasps the grip member 18 with the opening mouth 19 of the applicator cap 19 pressed against her (or his) intended facial spot and then closes the vacuum relief port 21 by a finger tip. As a result, the negative pressure at the venturi throat 12a is also applied to the particular facial spot enclosed by the cap opening mouth 19a to conduct desired suction cleaning of the spot.

Such suction cleaning may be effected over a wide range by moving the applicator cap 19 from one spot to another on the user's face. Further, it is also possible to clean the entire face by selectively using various applicator caps.

The negative pressure applied to the user's face may be steplessly adjusted by varying the flow rate of the tap water passing through the negative pressure generator 3 or by partially opening the vacuum relief port 21 to different degrees. The vacuum relief port 21 may be fully opened to interrupt the suction cleaning operation.

For practical purpose, it is recommended to use the skin cleaner of the invention at the time of or immediately after taking a bath. This is because the skin pores become fully open under heat to allow ready discharge, by suction cleaning, of various wastes (metabolic wastes, cosmetic residues, dust, etc.) which have accumulated within the pores.

The wastes collected by the applicator cap 19 may be washed away by directing toward the cap 19 the water discharged through the hose 22. For this purpose, the washing attachment 23, which has a water passage 23b of reduced cross section, may be connected to the hose 22 to provide a more vigorous jet of water adapted for washing. It should be noted in this connection that a suitable amount of air is introduced through the suction nose 15 into the water discharged through the

washing attachment 23 during such washing, and the introduced air forms minute bubbles which ultimately break with resultant production of ultrasonic waves to enhance washing effect.

Further, the washing attachment 23 may be pressed against the user's face after the above described suction cleaning to conduct washing thereof with comfortable massaging effect with results in accelerated blood circulation and metabolism. In this case, the conical washing attachment 23 also has an advantage of preventing water splash during such face washing.

Figure 4 illustrates a second embodiment of the invention in which a negative pressure generator 3' is connected to a tap water faucet 1 by means of a vertically extending flexible hose 25. More specifically, the generator 3' has an upper closure member 3c integrally formed with an upward connector projection 3d which is connected to the lower end of the hose 25, whereas the upper end of the hose 25 is connected to the discharge end of the faucet 1 by means of an expandable clamp member 2'. Otherwise, the second embodiment is substantially identical in function and configuration to the first embodiment illustrated in Figure 1.

According to a third embodiment of the invention illustrated in Figures 5 and 6, a negative pressure generator 3'' is accommodated in a casing 26 which serves as a grip member. The generator 3'' has a water inlet connector 30 which is connected to one end of a relatively long flexible hose 27. The other end of the hose 27 is connected to the discharge end of a faucet 1 by means of an expandable clamp member 2''.

As better illustrated in Figure 6, the negative pressure generator 3'' internally has a water passage 12'' which is designed to produce a negative pressure at a minimum cross-sectional portion 12a''. The portion 12a'' communicates with a suction nose 15'' extending forward to a foremost wall 29 of the casing 26 for directly receiving a tapered projection 19b of an applicator cap 19. The portion 12a'' further communicates with a rearwardly extending vacuum relief port 21'' which is closable by a finger.

The lower end of the negative pressure generator 3'' or the water passage 12'' is connected to a flexible hose 28 which in turn may be connected to a washing attachment (not shown) which is similar to the one illustrated in Figure 1.

The vacuum skin cleaner according to the invention requires no electric parts (motors, etc.), so that it can be operated very safely and washed clean with water after operation. Further, need for water supply makes the skin cleaner of the invention particularly advantageous for use in a bath room (during or after taking a bath) where vacuum

skin cleaning is considered most effective. Still further, the simplicity in construction of the skin cleaner reduces the possibility of malfunction and ensures a long service.

The invention may be further varied in many ways. For instance, the releasable lock mechanism 13 (Figure 1) may be provided in the form of spring-biased balls or like elements which engage with and disengage from the annular projection 10 of the attachment lower member 5b in response to push and pull on the negative pressure generator 3, consequently obviating the buttons 13b. Further, the water discharge hose 22 (or 28) and the washing attachment 23 may be obviated.

Claims

1. A vacuum skin cleaner comprising: a negative pressure generator (3, 3', 3'') having an internal water passage (12, 12'') and a suction passage (15, 15''), said water passage (12, 12'') being connected at one end to a tap water faucet (1) and having a discharge opening at the other end, said water passage (12, 12'') further having a cross-sectionally reduced intermediate portion (12a, 12a''); an applicator cap (19) communicating with said suction passage (15, 15'') and having an open mouth (19a) for contact with the human skin; a grip member (18, 26) for holding said applicator cap (19); and a closable vacuum relief port (21, 21'') provided at said grip portion (18, 26) for communication with said applicator cap (19); characterized in that said vacuum relief port (21, 21'') opens directly into the exterior and is directly closable by a finger.
2. The vacuum skin cleaner according to claim 1, wherein said applicator cap (19) is connected to said suction passage (15) by means of a hose (17).
3. The vacuum skin cleaner according to claim 2, wherein said applicator cap (19) is exchangeably mounted to said grip member (18) which has an air passage (18b) communicating with said hose (17).
4. The vacuum skin cleaner according to claim 3, wherein said vacuum relief port (21) communicates with said air passage (18b) of said grip member (18).
5. The vacuum skin cleaner according to any one of claims 1 to 4, wherein said discharge opening of said water passage (12) is connected to a detachable washing attachment (23) by means of a hose (22).

6. The vacuum skin cleaner according to any one of claims 1 to 5, wherein said negative pressure generator (3) is removably connected to said faucet (1) by means of a mounting attachment (2), a first annular seal (8) being interposed between said attachment and said faucet, a second annular seal (11) being interposed between said attachment and said generator.
7. The vacuum skin cleaner according to claim 6, wherein said mounting attachment (2) has an upper portion (4) removably fixed to said faucet (1) by a plurality of radially extending set screws (6), said mounting attachment further having a lower portion (5) removably fitted into said negative pressure generator (3).
8. The vacuum skin cleaner according to claim 7, wherein said lower portion (5) of said mounting attachment (2) is formed with an annular projection (10), a releasable lock mechanism (13) being provided between said attachment and said negative pressure generator (3) to engage with and disengage from said annular projection.
9. The vacuum skin cleaner according to claim 8, wherein said lock mechanism (13) comprises spring-biased engaging elements (14) which are radially movable for engagement with and disengagement from said annular projection (10) of said attachment lower portion (4).
10. The vacuum skin cleaner according to claim 1, wherein said negative pressure generator (3', 3'') is connected to said faucet (1) by means of a hose (25, 27).
11. The vacuum skin cleaner according to claim 1, wherein said grip member (26) serves as a casing for accommodating said negative pressure generator (3''), and said suction passage (15'') is in the form of a projecting suction nose for directly receiving said applicator cap (19).
12. The vacuum skin cleaner according to any one of claims 1 to 10, wherein said water passage (12) is in the form of a venturi passage progressively increasing in cross section from a venturi throat at which said cross-sectionally reduced portion (12a) is located.

Patentansprüche

1. Mit Unterdruck arbeitendes Hautreinigungsgerät, bestehend aus: einem Unterdruckerzeuger

(3, 3', 3'') mit einem inneren Wasserdurchlauf (12, 12'') und einem Ansaugkanal (15, 15''), wobei der Wasserdurchlauf (12, 12'') an einem Ende an einen Wasserhahn (1) für Leitungswasser angeschlossen ist und am anderen Ende eine Abflußöffnung besitzt, und der Wasserdurchlauf (12, 12'') außerdem einen im Querschnitt reduzierten mittleren Abschnitt (12a, 12a'') besitzt; eine Ansatzkappe (19) in Verbindung mit dem Ansaugkanal (15, 15'') und mit einem offenen Mundstück (19a) zur Berührung mit der menschlichen Haut; einem Griffelement (18, 26) zum Festhalten der Ansatzkappe (19); und mit einer am Griffabschnitt (18, 26) zur Verbindung mit der Ansatzkappe (19) vorgesehenen verschließbaren Unterdruckbelüftungsöffnung (21, 21''); dadurch gekennzeichnet, daß die Unterdruckbelüftungsöffnung (21, 21'') direkt nach außen öffnet und direkt durch einen Finger verschließbar ist.

2. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 1, wobei die Ansatzkappe (19) mit dem Ansaugkanal (15) durch einen Schlauch (17) verbunden ist.
3. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 2, wobei die Ansatzkappe (19) austauschbar auf dem eine Luftdurchführung (18b) in Verbindung mit dem Schlauch (17) besitzenden Griffelement (18) befestigt ist.
4. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 3, wobei die Unterdruckbelüftungsöffnung (21) in Verbindung mit der Luftdurchführung (18b) des Griffelements (18) steht.
5. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß wenigstens einem der vorhergehenden Ansprüche, wobei die Abflußöffnung des Wasserdurchlaufes (12) an eine lösbare Waschansatz (23) durch einen Schlauch (22) angeschlossen ist.
6. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß wenigstens einem der vorhergehenden Ansprüche, wobei der Unterdruckerzeuger (3) entferntbar an den Wasserhahn (1) mittels eines Montageansatzes (2) angeschlossen ist, wobei ein erster Dichtring (8) zwischen dem Ansatz und dem Wasserhahn und ein zweiter Dichtring (11) zwischen dem Ansatz und dem Unterdruckerzeuger angeordnet ist.
7. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 6, wobei der Montageansatz (2) einen durch zahlreiche sich radial er-

streckende Stellschrauben (6) entfernbar an dem Wasserhahn (1) befestigten oberen Abschnitt (4) besitzt, und der Montageansatz zusätzlich einen entfernbar auf den Unterdruckerzeuger (3) aufgesetzten unteren Abschnitt (5) aufweist.

8. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 7, wobei der untere Abschnitt (5) der Befestigungsanbringung (2) mit einem ringförmigen Vorsprung (10) gebildet ist, und ein lösbarer Schließmechanismus (13) zwischen der Anbringung und dem Unterdruckerzeuger (3) zur Beaufschlagung mit und zur Trennung von dem Ringvorsprung vorgesehen ist.

9. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 8, wobei der Schließmechanismus (13) durch Federspannung beaufschlagende Elemente (14) enthält, die radial zur Beaufschlagung mit und zur Trennung von dem Ringvorsprung (10) des unteren Ansatzabschnittes (4) bewegbar sind.

10. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 1, wobei der Unterdruckerzeuger (3', 3'') mit dem Wasserhahn (1) durch einen Schlauch (25, 27) verbunden ist.

11. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß Anspruch 1, wobei das Griffelement (26) als Gehäuse zur Aufnahme des Unterdruckerzeugers (3'') dient, und der Ansaugkanal (15'') die Form einer vorstehenden Ansaugnase zur direkten Aufnahme der Ansatzkappe (19) hat.

12. Mit Unterdruck arbeitendes Hautreinigungsgerät gemäß wenigstens einem der Ansprüche 1 bis 10, wobei der Wasserdurchlauf (12) die Form eines Venturirohrs aufweist, das im Querschnitt von einer Venturiverengung zunimmt, an der sich der querschnittsreduzierte Abschnitt (12a) befindet.

Revendications

1. Dispositif de nettoyage de la peau à dépression, comprenant des moyens de production de pression négative (3, 3', 3''), comportant un passage d'eau (12, 12'') intérieur et un passage d'aspiration (15, 15''), le passage d'eau (12, 12'') étant relié à une extrémité à un robinet d'eau courante (1) et comportant un orifice d'évacuation à l'autre extrémité, ce passage d'eau (12, 12'') comportant en outre une partie intermédiaire (12a, 12a'') à section transversale

réduite ; un capuchon applicateur (19), communiquant avec le passage d'aspiration (15, 15'') et comportant une embouchure ouverte (19a) destinée à venir au contact de la peau d'un individu ; une pièce de préhension (18, 26), servant à maintenir le capuchon applicateur (19) ; et un orifice de suppression de vide (21, 21'') qui est agencé de façon à pouvoir être obturé et est disposé sur la pièce de préhension (18, 26) de façon à pouvoir communiquer avec le capuchon applicateur (19), caractérisé en ce que l'orifice de suppression de vide (21, 21'') débouche directement à l'extérieur et peut être directement obturé au moyen d'un doigt.

2. Dispositif de nettoyage de la peau à dépression suivant la revendication 1, dans lequel le capuchon applicateur (19) est relié au passage d'aspiration (15) au moyen d'un tuyau souple (17).

3. Dispositif de nettoyage de la peau à dépression suivant la revendication 2, dans lequel le capuchon applicateur (19) est monté, de façon à pouvoir être échangé, sur la pièce de préhension (18) qui comporte un passage d'air (18b) communiquant avec le tuyau souple (17).

4. Dispositif de nettoyage de la peau à dépression suivant la revendication 3, dans lequel l'orifice de suppression de vide (21) communique avec le passage d'air (18b) de la pièce de préhension (18).

5. Dispositif de nettoyage de la peau à dépression suivant l'une quelconque des revendications 1 à 4, dans lequel l'orifice d'évacuation du passage d'eau (12) est relié, au moyen d'un tuyau souple (22), à un élément auxiliaire de lavage (23) agencé de façon à pouvoir être séparé.

6. Dispositif de nettoyage de la peau à dépression suivant l'une quelconque des revendications 1 à 5, dans lequel les moyens de production de pression négative (3) sont reliés d'une manière amovible au robinet (1) au moyen d'une pièce auxiliaire de montage (2), une première garniture annulaire d'étanchéité (8) étant interposée entre cette pièce auxiliaire et le robinet et une seconde garniture annulaire d'étanchéité (11) étant interposée entre la pièce auxiliaire et les moyens de production de pression négative.

7. Dispositif de nettoyage de la peau à dépression suivant la revendication 6, dans lequel la

pièce auxiliaire de montage (2) comporte une partie supérieure (4) fixée d'une manière amovible au robinet (1) au moyen de plusieurs vis de fixation (6) s'étendant radialement, la pièce auxiliaire de montage comportant en outre une partie inférieure (5) emboîtée d'une manière amovible dans les moyens de production de pression négative (3).

8. Dispositif de nettoyage de la peau à dépression suivant la revendication 7, dans lequel la partie inférieure (5) de la pièce auxiliaire de montage (2) comporte une partie en saillie annulaire (10), un mécanisme de verrouillage (13) libérable étant disposé entre cette pièce auxiliaire et les moyens de production de pression négative (3) de façon à venir en prise et hors de prise avec la partie en saillie annulaire.
9. Dispositif de nettoyage de la peau à dépression suivant la revendication 8, dans lequel le mécanisme de verrouillage (13) comprend des éléments de venue en prise (14) à ressort qui sont mobiles radialement de façon à pouvoir venir en prise et hors de prise avec la partie en saillie annulaire (10) de la partie inférieure (4) de la pièce auxiliaire.
10. Dispositif de nettoyage de la peau à dépression suivant la revendication 1, dans lequel les moyens de production de pression négative (3', 3'') sont reliés au robinet (1) au moyen d'un tuyau souple (25, 27).
11. Dispositif de nettoyage de la peau à dépression suivant la revendication 1, dans lequel la pièce de préhension (26) sert de boîtier pour loger les moyens de production de pression négative (3'') et le passage d'aspiration (15'') se présente sous la forme d'un nez d'aspiration en saillie qui est destiné à recevoir directement le capuchon applicateur (19).
12. Dispositif de nettoyage de la peau à dépression suivant l'une quelconque des revendications 1 à 10, dans lequel le passage d'eau (12) se présente sous la forme d'un passage de Venturi dont la section transversale augmente progressivement à partir d'un col de Venturi auquel est située la partie (12a) à section transversale réduite.

FIG. 1

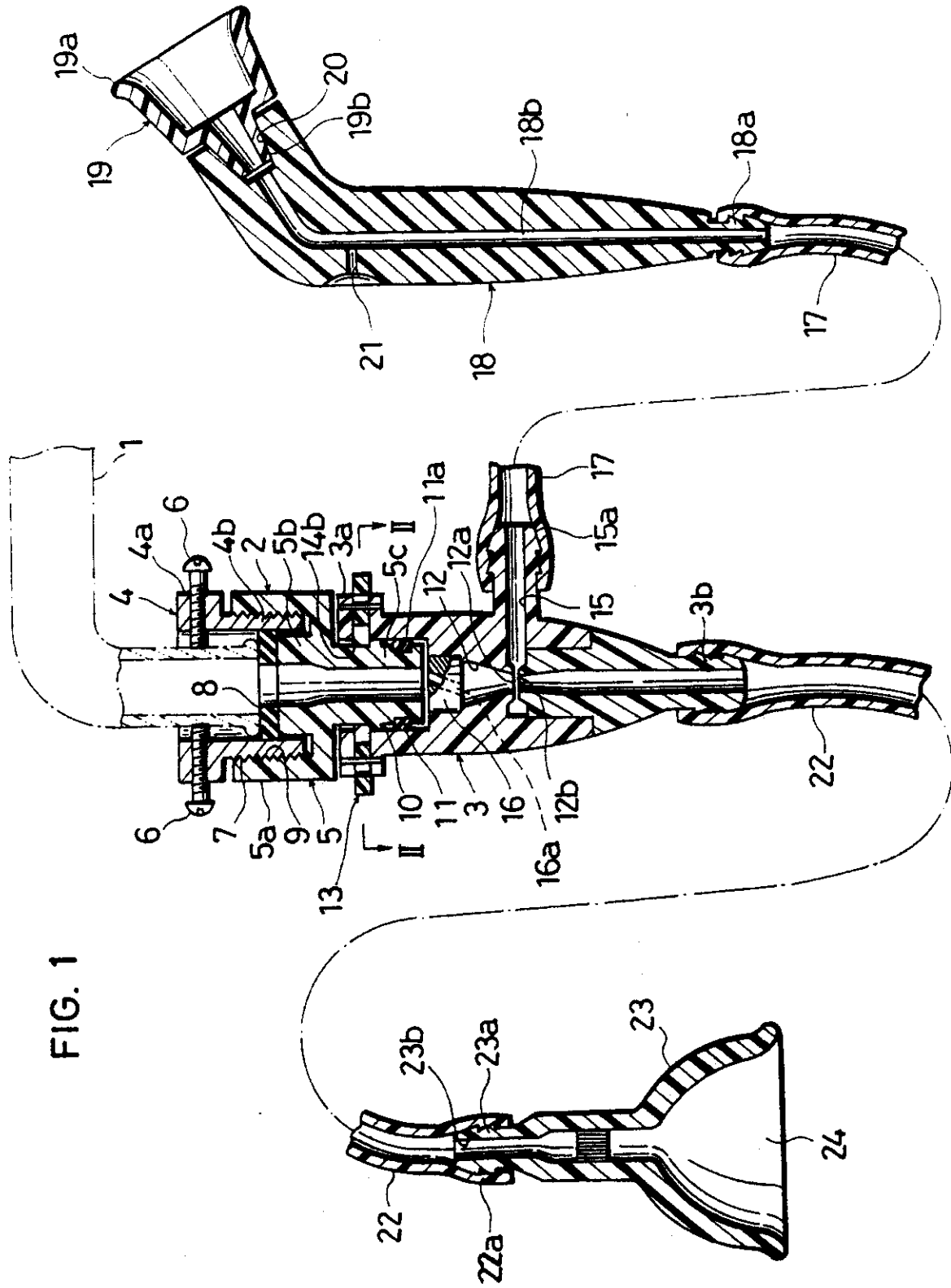


FIG. 2

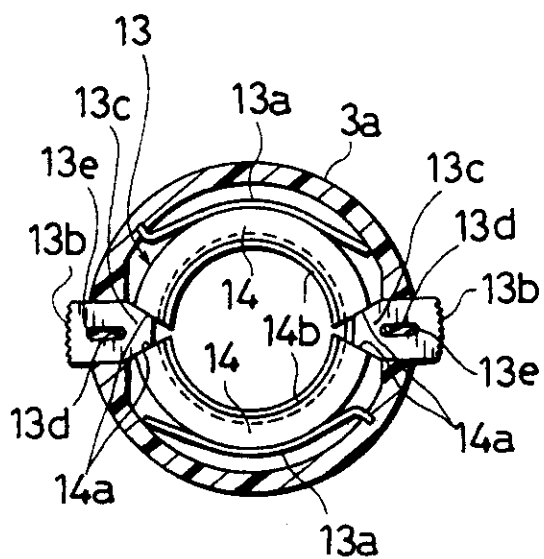


FIG. 3

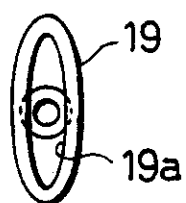


FIG. 4

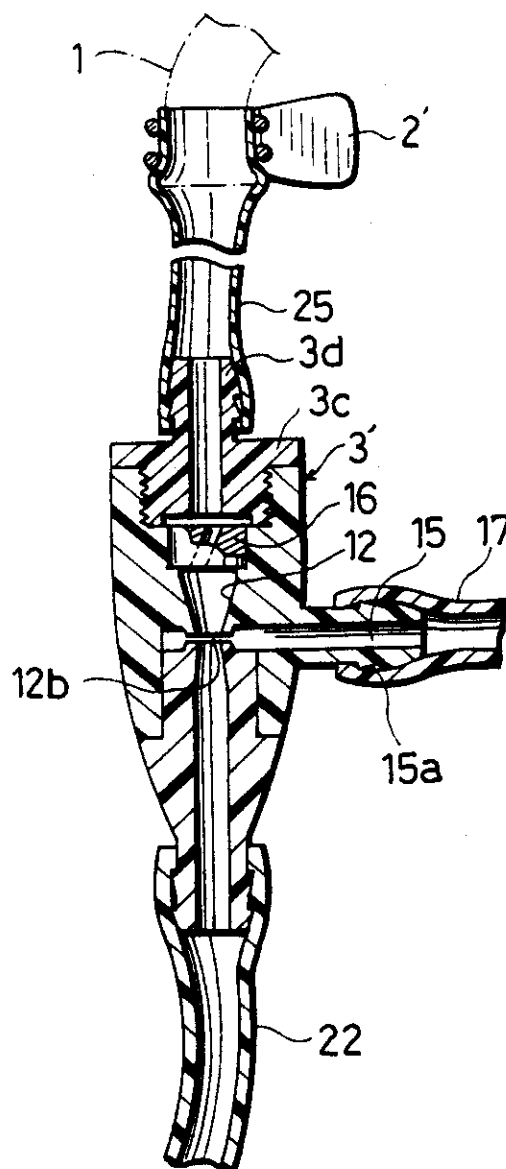


FIG. 5

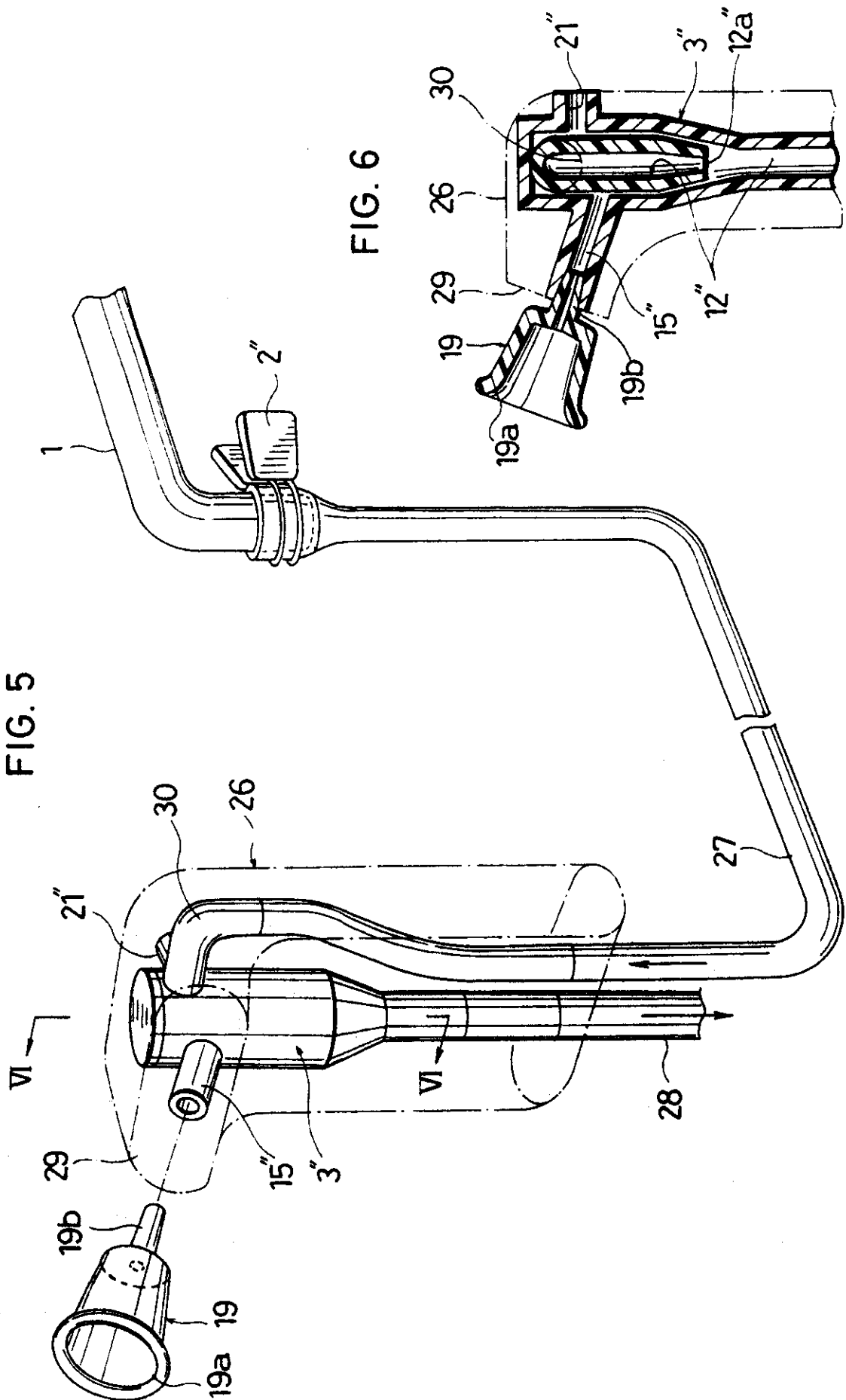
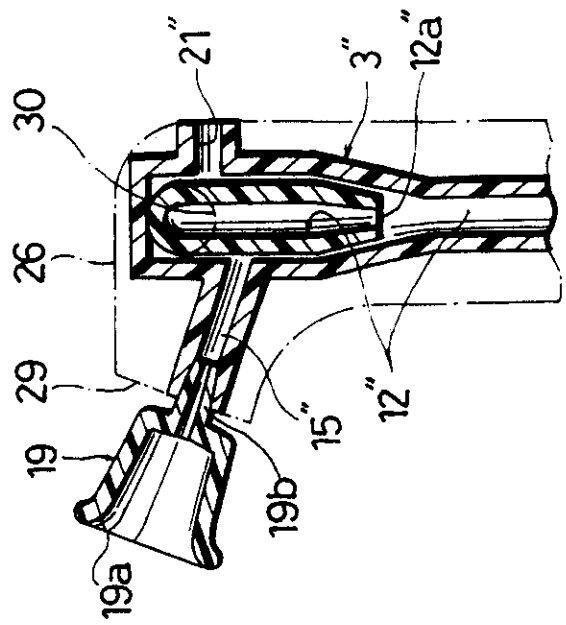


FIG. 6



REGISTER ENTRY FOR EP0264851

European Application No EP87115164.3 filing date 16.10.1987

Priority claimed:

18.10.1986 in Japan - doc: 352478508

Designated States BE CH DE ES FR GB IT LI LU NL SE AT

Title VACUUM SKIN CLEANER

Applicant/Proprietor

AZZ INTERNATIONAL CO., LTD., Mido Urban-Life No. 711 55-1, Kawaramachi
5-chome, Higashi-ku Osaka, Japan [ADP No. 50686443001]

Inventor

MASUO YAMAMOTO, 205-228, No Habikino-shi, Osaka, Japan
[ADP No. 55621635001]

Classified to

A5R
A61H

Address for Service

MARKS & CLERK, 57-60 Lincoln's Inn Fields, LONDON, WC2A 3LS, United
Kingdom [ADP No. 00000018001]

EPO Representative

WEISE SKUHRA REINHARD, Leopoldstrasse 51, D-8000 München 40, Federal
Republic of Germany [ADP No. 50516483001]

Publication No EP0264851 dated 27.04.1988

Publication in English

Examination requested 16.10.1987

Patent Granted with effect from 13.04.1994 (Section 25(1)) with title VACUUM
SKIN CLEANER.

24.07.1989 EPO: Search report published on 23.08.1989

Entry Type 25.11 Staff ID. Auth ID. EPT

08.10.1993 MARKS & CLERK, 57-60 Lincoln's Inn Fields, LONDON, WC2A 3LS, United
Kingdom [ADP No. 00000018001]

registered as address for service

Entry Type 8.11 Staff ID. ER1 Auth ID. AA

11.03.1994 Notification from EPO of change of EPO Representative details from
WEISE SKUHRA REINHARD, Leopoldstrasse 51, D-8000 München 40,
Federal Republic of Germany [ADP No. 50516483001]
to

WEISE SKUHRA REINHARD, Postfach 44 01 51, D-80750 München, Federal
Republic of Germany [ADP No. 50516483001]

Entry Type 25.14 Staff ID. RD06 Auth ID. EPT

**** END OF REGISTER ENTRY ****

OA80-01
EP

OPTICS - PATENTS

17/08/94 16:42:50
PAGE: 1

RENEWAL DETAILS

PUBLICATION NUMBER

EP0264851

PROPRIETOR(S)

AZZ INTERNATIONAL CO., LTD., Mido Urban-Life No. 711 55-1,
Kawaramachi 5-chome, Higashi-ku Osaka, Japan

DATE FILED

16.10.1987

DATE GRANTED

13.04.1994

DATE NEXT RENEWAL DUE

16.10.1994

DATE NOT IN FORCE

DATE OF LAST RENEWAL

YEAR OF LAST RENEWAL

00

STATUS

PATENT IN FORCE