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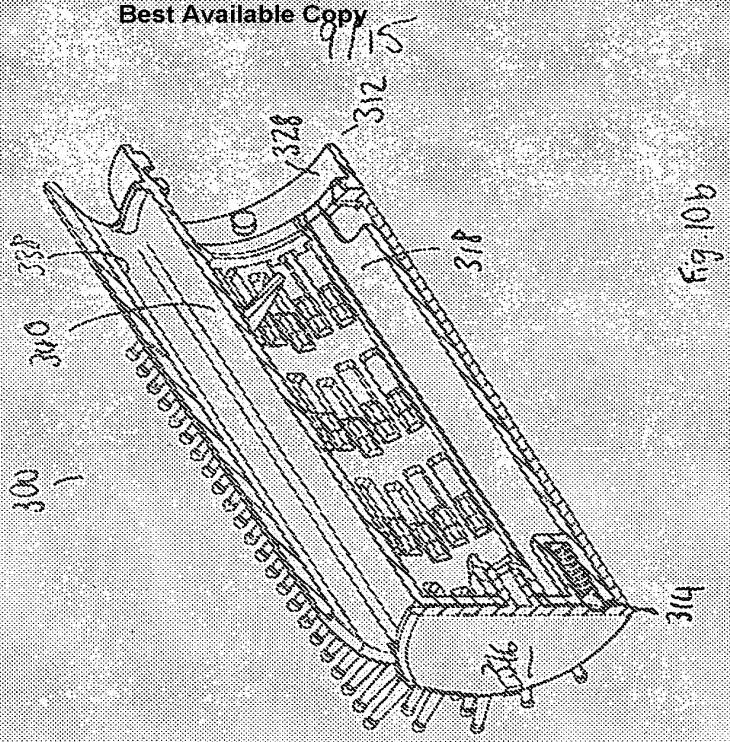


Fig. 10b

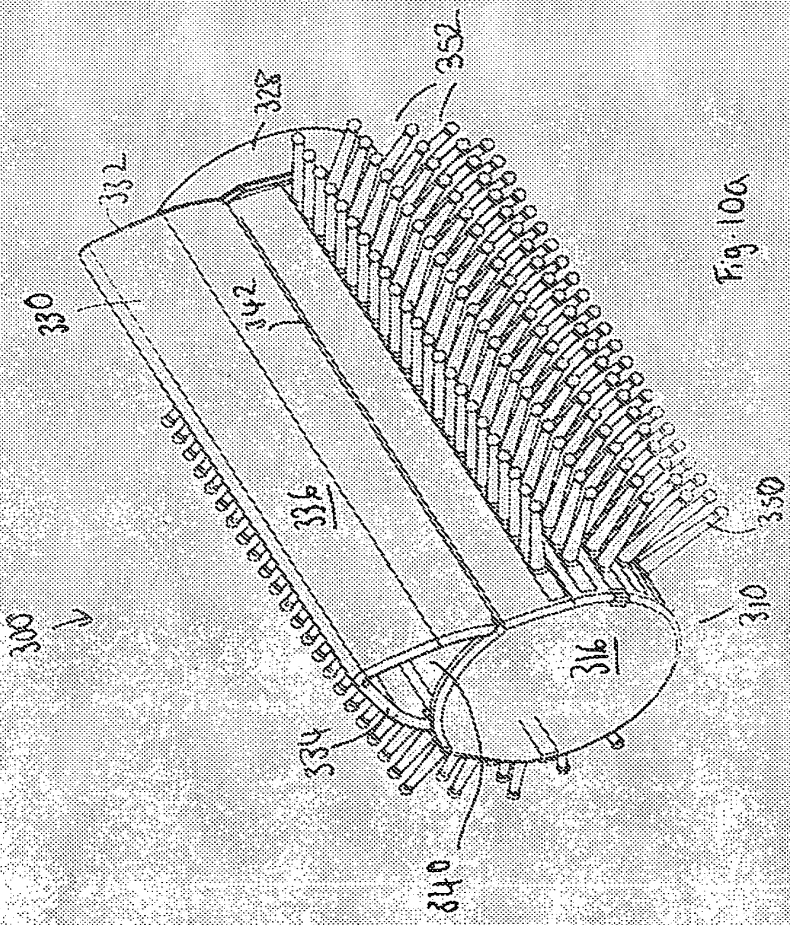


Fig. 10c

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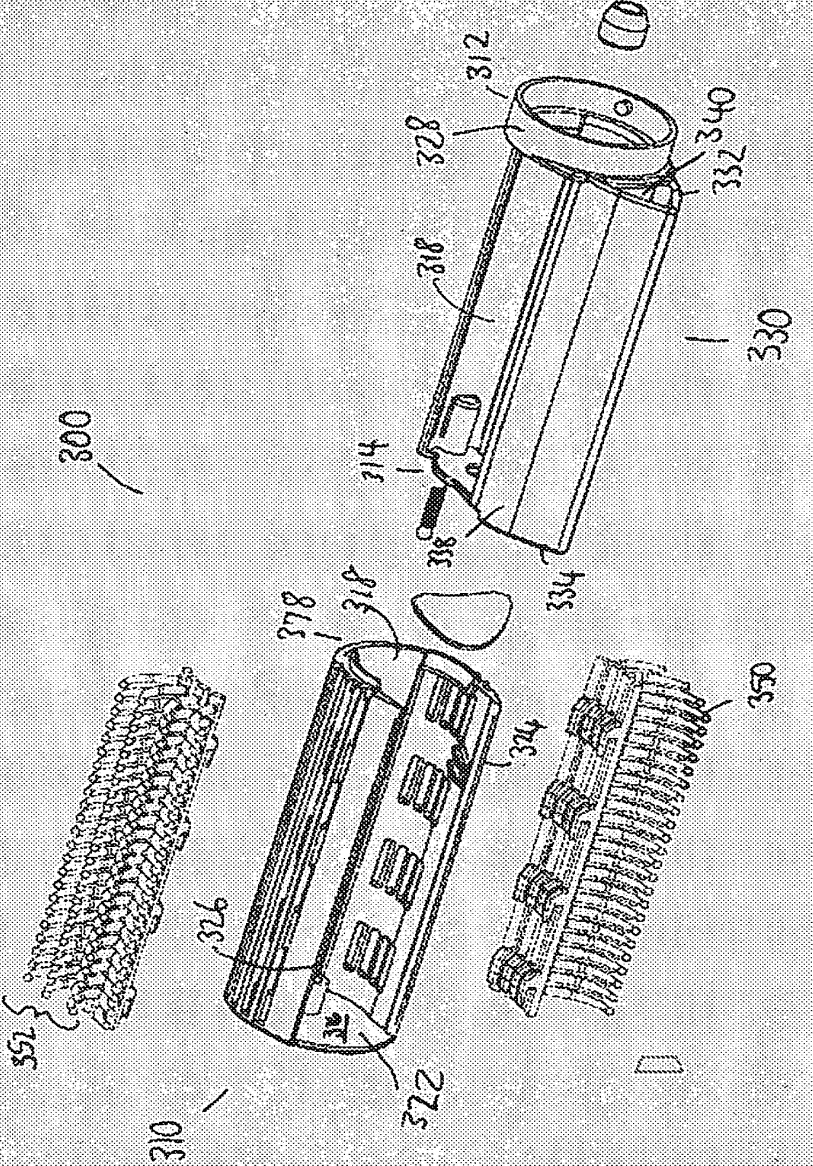


Fig. 11a

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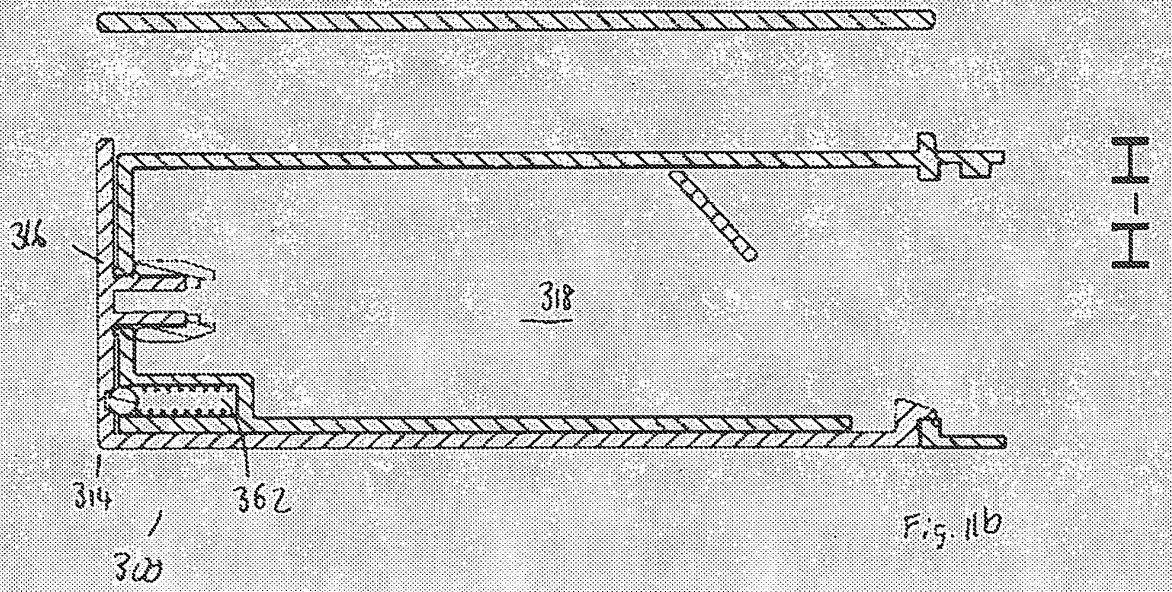


Fig 11b

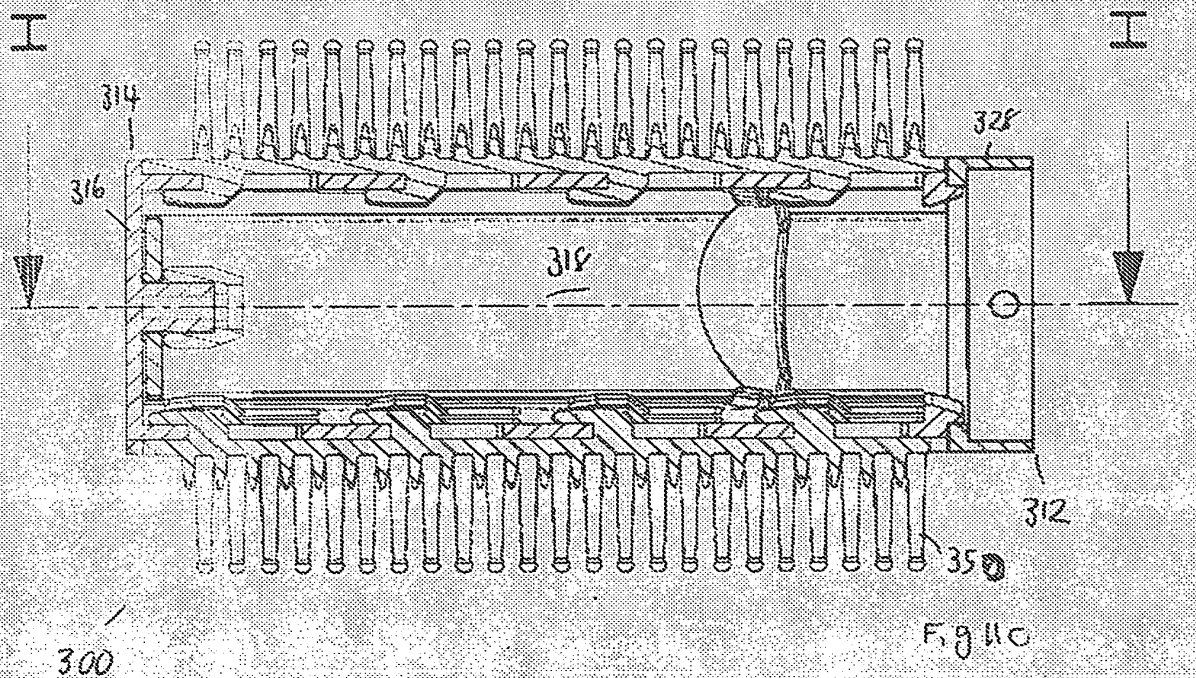


Fig 11c

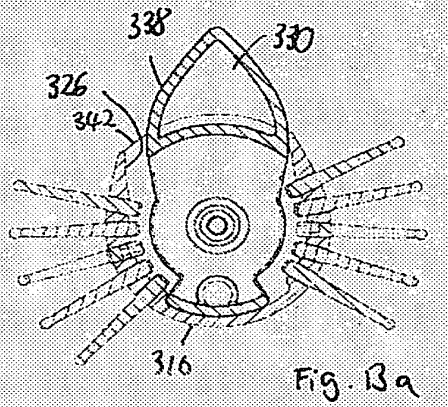


Fig. 13a

K-K

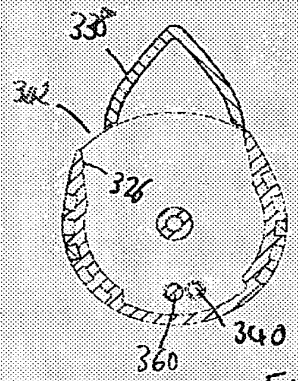


Fig. 13b

J-J

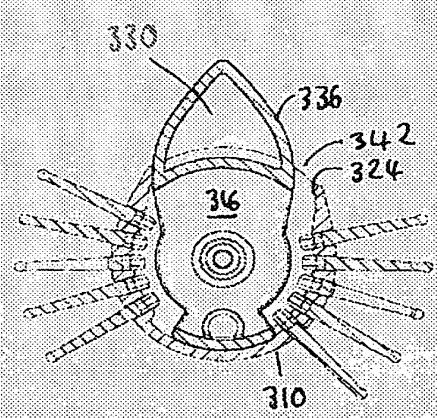


Fig. 12a

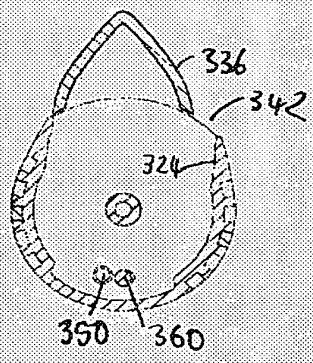


Fig. 12b

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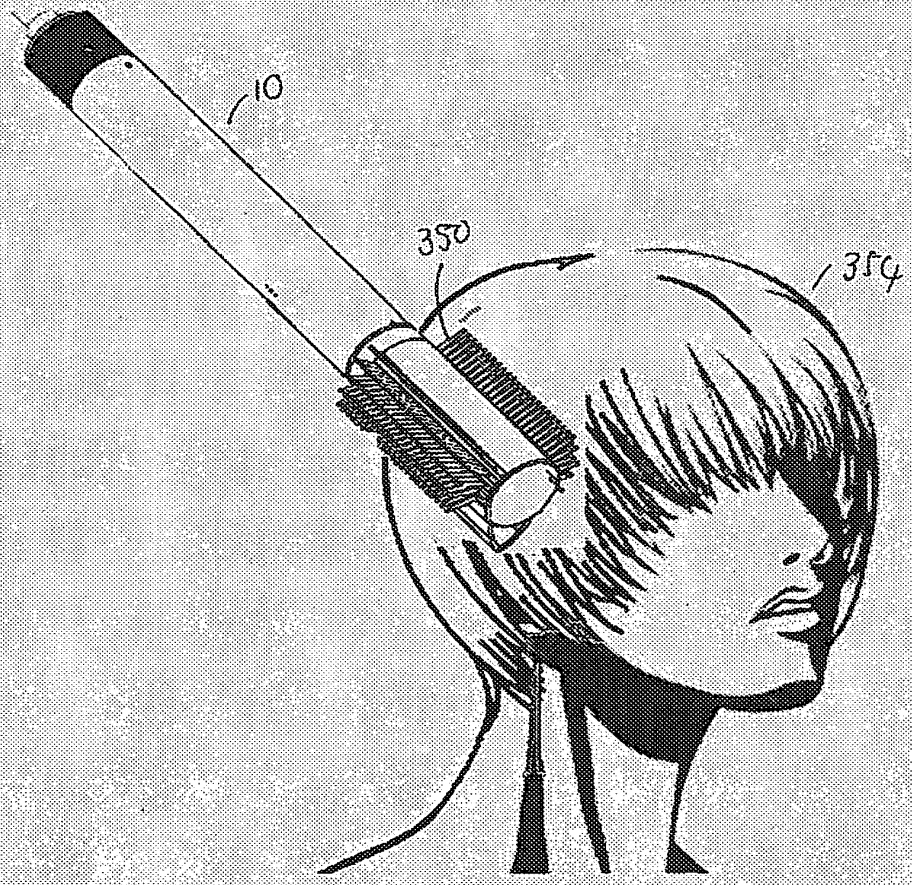


Fig. 14

Best Available Copy

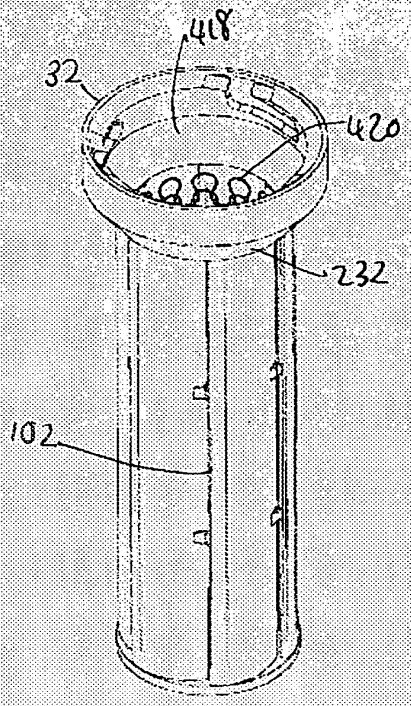


Fig. 15a

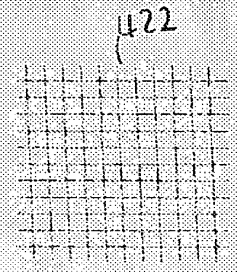


Fig. 16a

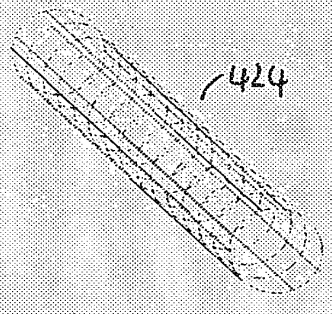


Fig. 16b

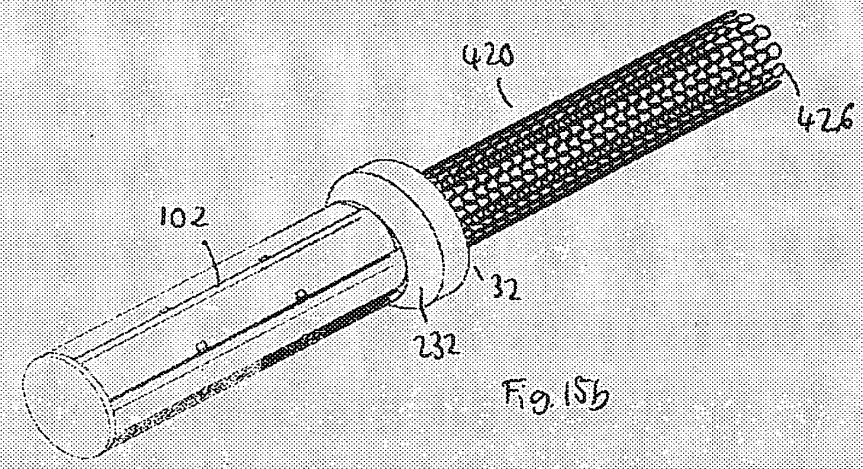


Fig. 15b

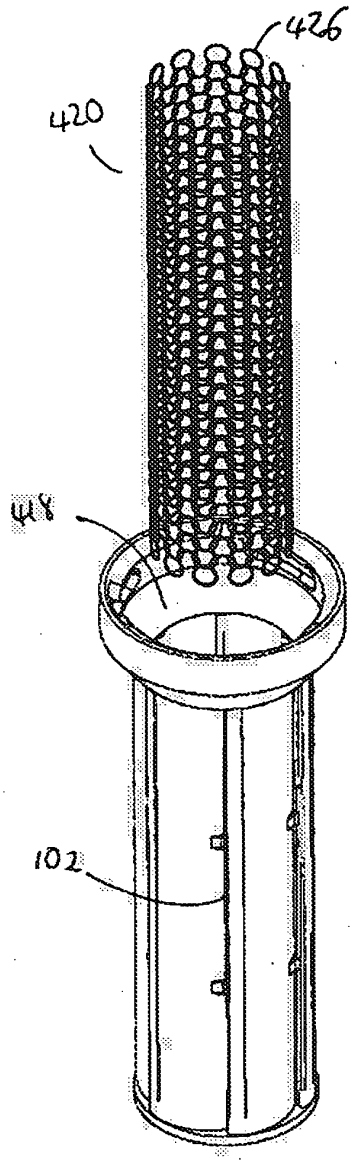


Fig. 15c

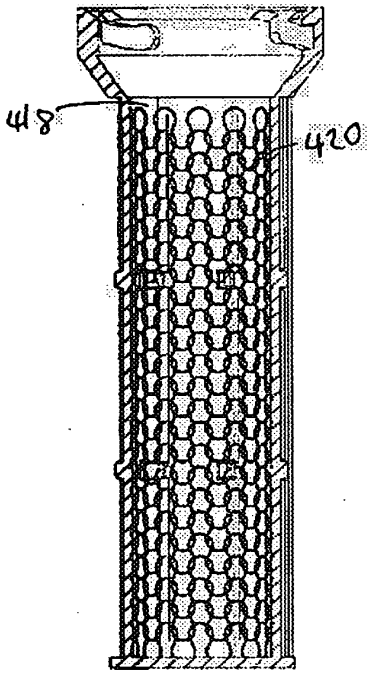


Fig. 15d

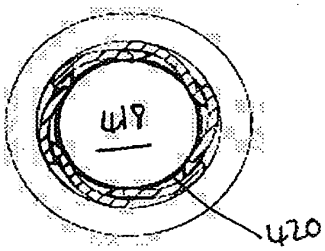


Fig. 15e

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MAY 19 2015
PATENT & TRADEMARK OFFICE

Docket No.: 424662093300
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 | Confirmation No.: 9085

Filed: March 12, 2015 | Art Unit: 3744

For: ATTACHMENT FOR A HAND HELD APPLIANCE | Examiner: Not Yet Assigned

CLAIM FOR PRIORITY AND SUBMISSION OF DOCUMENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Madam:

Applicants hereby claim priority under 35 U.S.C. § 119 based on the following prior foreign applications filed in the following foreign country on the date indicated:

Country	Application No.	Date
GB	1404982.9	March 20, 2014
GB	1404985.2	March 20, 2014

In support of this claim, a certified copy of the said original foreign application is filed herewith.

Dated: May 19, 2015

Respectfully submitted,

By _____
Christopher Gloria
Registration No.:71,907
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
(703) 760-7389

va-450886

OPAP AKIMA-3
MAY 19 2015
PATENT & TRADEMARK OFFICE

USED IN LIEU OF PTO/SB/21 (07-09)

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	2

Application Number	14/656,357
Filing Date	March 12, 2015
First Named Inventor	Alasdair Michael MACLAINE
Art Unit	3744
Examiner Name	Not Yet Assigned
Attorney Docket Number	424662093300

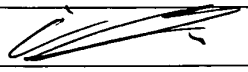
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- [ ] Petition
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- [ ] Power of Attorney, Revocation Change of Correspondence Address
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- [ ] CD, Number of CD(s) _____
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- [ ] After Allowance Communication to TC
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Claim for Priority and Submission of Document (1 page)
Return Receipt postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MORRISON & FOERSTER LLP		
Signature			
Printed name	Christopher Gloria		
Date	May 19, 2015	Reg. No.	71,907

va-450941

PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	ATTACHMENT FOR A HAND HELD APPLIANCE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/656,357 filed on March 12, 2015 .

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

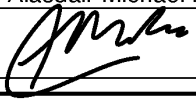
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LEGAL NAME OF INVENTOR

Inventor: Alasdair Michael MACLAINE Date (Optional) : 9th April 2015

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

Docket No.: 424662093300
Client Reference No.: USP1314B

va-446397

Electronic Acknowledgement Receipt

EFS ID:	22605136
Application Number:	14656357
International Application Number:	
Confirmation Number:	9085
Title of Invention:	ATTACHMENT FOR A HAND HELD APPLIANCE
First Named Inventor/Applicant Name:	Alasdair Michael MACLAINE
Customer Number:	25227
Filer:	Bradley J. Meier/Donna Bernecker
Filer Authorized By:	Bradley J. Meier
Attorney Docket Number:	424662093300
Receipt Date:	11-JUN-2015
Filing Date:	12-MAR-2015
Time Stamp:	16:12:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	Declaration_424662093300.pdf	38349 0ca97c8c46698d665f0c45f952637a3a1094f522	no	1

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	14/656,357
Filing Date	March 12, 2015
First Named Inventor	Alasdair Michael MACLAINE
Art Unit	3776
Examiner Name	Not Yet Assigned
Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-3,981,313	09-21-1976	Burke et al.	
	2.	US-2008/0041406	02-21-2008	Le	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	3.	JP-62-41606	02-23-1987	Matsushita Electric Works Ltd.	Figs. Only	
	4.	WO-92/14378	09-03-1992	Braun Aktiengesellschaft (Karl-Heinz LANGE et al.)	Machine Translation	X
	5.	WO-98/27842	07-02-1998	Philips Electronics N.V. (Huub EHLHARDT et al.)		

Examiner Signature		Date Considered	

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	6.	International Search Report and Written Opinion mailed May 8, 2015, directed to International Application No. PCT/GB2015/050659; 12 pages	

Examiner Signature		Date Considered	

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va-456651

⑲日本国特許庁（JP）　⑪特許出願公開

⑫公開特許公報（A）　昭62－41606

⑤1Int.Cl.⁴	識別記号	庁内整理番号	⑬公開　昭和62年(1987)2月23日
A 46 B 5/00		8206－3B	
15/00		8206－3B	

審査請求　未請求　発明の数 1　（全4頁）

⑤4発明の名称　ヘアーブラシ

⑳特　願　昭60－180124

㉒出　願　昭60(1985)8月15日

⑦2発 明 者　豊海　百合貢　門真市大字門真1048番地　松下電工株式会社内

⑦1出 願 人　松下電工株式会社　門真市大字門真1048番地

⑦4代 理 人　弁理士　松本　武彦

明　細　書

1. 発明の名称

ヘアーブラシ

2. 特許請求の範囲

(1) ブリッスルとグリップ部に導電性材料からなる部分が備えられているとともに、両部分が電気的に接続されてなるヘアーブラシ。

(2) ブリッスル、ブリッスル台、グリップ部が導電性材料で一体に形成されてなる特許請求の範囲第1項記載のヘアーブラシ。

(3) ブリッスルの先端とその芯材が導電性材料からなっていて、芯材が前記材料よりも摩擦係数の低い材料でモールドされてなる特許請求の範囲第1項または第2項記載のヘアーブラシ。

(4) 導電性材料が導電性ゴムである特許請求の範囲第1項から第3項までのいずれかに記載のヘアーブラシ。

3. 発明の詳細な説明

〔技術分野〕

この発明はヘアーブラシに関する。

〔背景技術〕

従来のヘアーブラシのブリッスルは、ブラッシング時のすき性を向上させるため、豚毛、ナイロン、ＰＢＴなどで形成しているが、このような材料でブリッスルを形成すると、ブラッシングすることに伴って毛髪に静電気が発生して帯電が起きるため、良好なブラッシングやウェーブを作ることが困難となる問題があった。

〔発明の目的〕

このような問題をなくすため、この発明は、ブラッシングによる帯電が防止されて、良好なブラッシングやウェーブを作ることができるヘアーブラシを提供することを目的とする。

〔発明の開示〕

前記目的を達成するため、この発明は、ブリッスルとグリップ部に導電性材料からなる部分が備えられているとともに、両部分が電気的に接続されてなるヘアーブラシをその要旨とする。

以下に、この発明を、実施例をあらわした図面に基づいて詳しく説明する。

SharkNinja Ex. 1002
Page 212 of 1998

第１図および第２図は、ドライヤタイプでない通常の簡易型ヘアーブラシについての実施例をあらわしており、プラスチックや木などによってブラシ台１とグリップ芯２とが一体に形成されたものの外周を、多数のブリッスル３が設けられたブリッスル台４とグリップ部５とを一体に形成したもので被包して固着したものにおいて、これらブリッスル３を含むブリッスル台４とグリップ部５とを、導電性ゴムで形成してなる。この導電性ゴムとしては、たとえば、体積抵抗率が約10^{3}～$10^{10}\Omega$－cm程度の帯電防止効果のあるものが採用される。

前記のように構成されたヘアーブラシは、ブリッスル３とグリップ部５が導電性材料からなるとともに、両部分が導電性材料からなるブリッスル台４を介して電気的に接続されているので、ブラッシングに伴って発生する静電気がブリッスル３からブリッスル台４とグリップ部５を通して人体へとアースされて逃がされ、これによりブリッスル３に帯電するおそれがなくなる。また、実施例のように導電性ゴムを用いると、その弾性により頭皮への当たりも軟らかくなる。

第３図ないし第５図はヘアードライヤタイプについての実施例をあらわしている。第３図のＡ部を拡大して断面であらわした第４図にみるように、円筒形のブラシ台１は導電性のプラスチックで形成されていて、そのブラシ台１の外周を被包するブリッスル台４が前記10^{3}～$10^{10}\Omega$－cm程度の帯電防止用導電性ゴムで形成され、このブリッスル台４の外周に、ブリッスル頭６までを導電性ゴムとしたブリッスル芯材７を突出させてある。各ブリッスル芯材７の外周は、前記導電性ゴムよりもすべりやすい低摩擦係数の材料、たとえば、ナイロンとかＰＢＴなどで先細状に被覆されている。この場合、ブリッスル頭６だけは露出させてある。なお、ブリッスル台４の外周には、巻胴１７が巻き付けられている。

また、第５図にみるように、本体ハウジング側には、ヒーター８、雑音防止・温度制御用などの回路部品９、整流器１０、モータ１１および吸引ファン１２などが設けられ、これらが主ハウジングカバー１３で全体的に覆われている。主ハウジングカバーの材料としては、ＡＢＳ、ＰＣなど一般的な電気絶縁性のプラスチックが用いられているが、その外周を覆うため特別に設けられたグリップ部（グリップカバー）５の材料としては、導電性のプラスチックが用いられている。このグリップ部５と前記ブラシ台１とは、軸方向に互いに接して電気的に接続されている。

なお、第５図矢印は熱風導出孔１５からの熱風の流れをそれぞれあらわしている。また、１８，１９はスイッチ、２０は口金をあらわしている。

前記実施例では、ブリッスル頭６とブリッスル芯材７が導電性ゴムであり、ブラシ台４とグリップ部５が導電性プラスチックであるので、帯電防止効果が発揮されることはもちろん、ブリッスル頭６がゴム質として露出しているので、地肌に当たっても痛くなく、また、ブリッスル芯材７をナイロン、ＰＢＴなどの外皮で被覆してあるので、弾性力が増大するとともにすべりやすくなってブラッシング効果が向上する。

なお、第５図の実施例では、グリップ部５を所定のグリップ範囲全体にわたるように長くしてあるが、その半分長さとか、グリップされる要部のみに設けてもよい。

〔発明の効果〕

以上説明したように、この発明によれば、ブリッスルとグリップ部に導電性材料からなる部分が備えられているとともに、両部分が電気的に接続されてなるヘアーブラシとされているので、ブラッシングに伴う帯電が防止されて、良好なブラッシングとウェーブ作りが行える点で有利である。

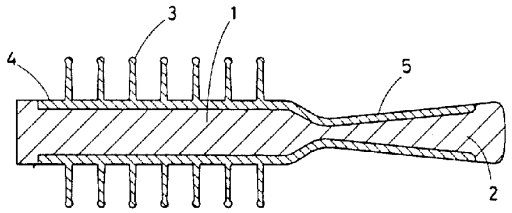
4. 図面の簡単な説明

第１図はこの発明の一実施例をあらわした簡易型ヘアーブラシの縦断面図、第２図はその外観斜視図、第３図はドライヤ型ヘアーブラシについての他の実施例をあらわした外観図、第４図は第３図のＡ部拡大断面図、第５図はハウジング部の拡大断面図である。

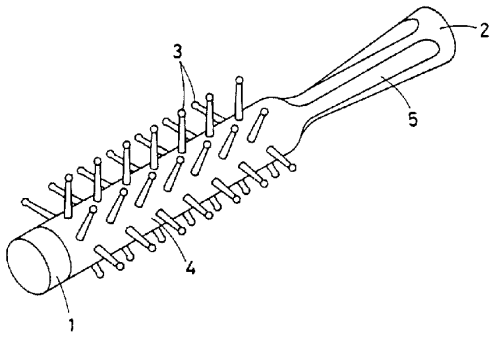
３…ブリッスル　５…グリップ部

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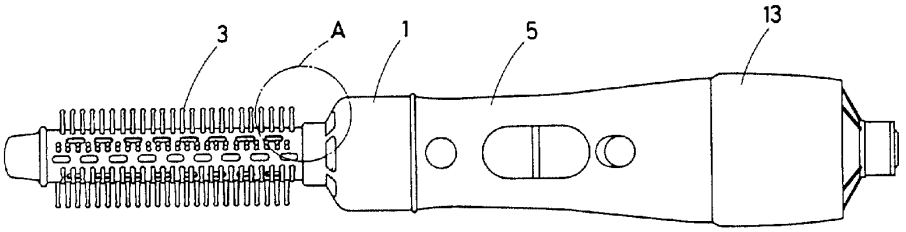
第 1 図



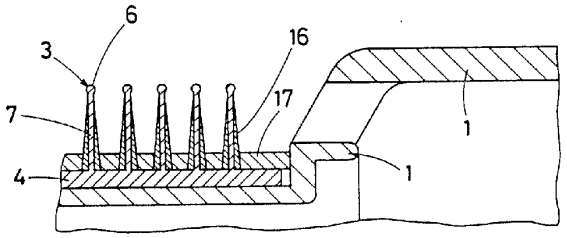
第 2 図



第 3 図

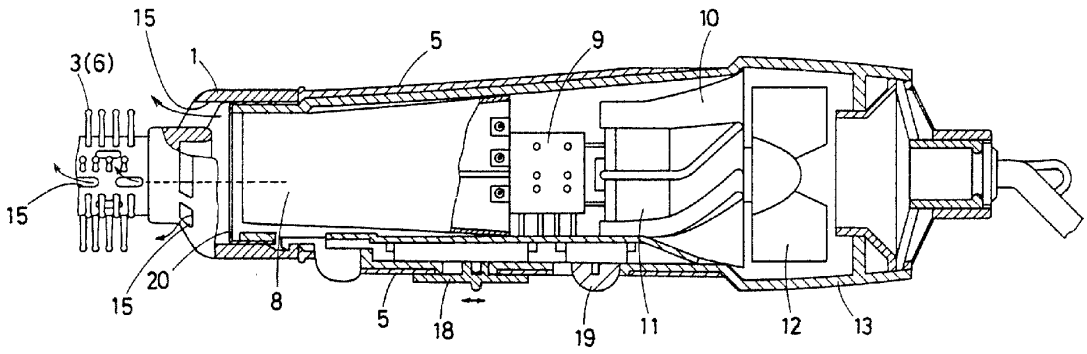


第 4 図



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第 5 図



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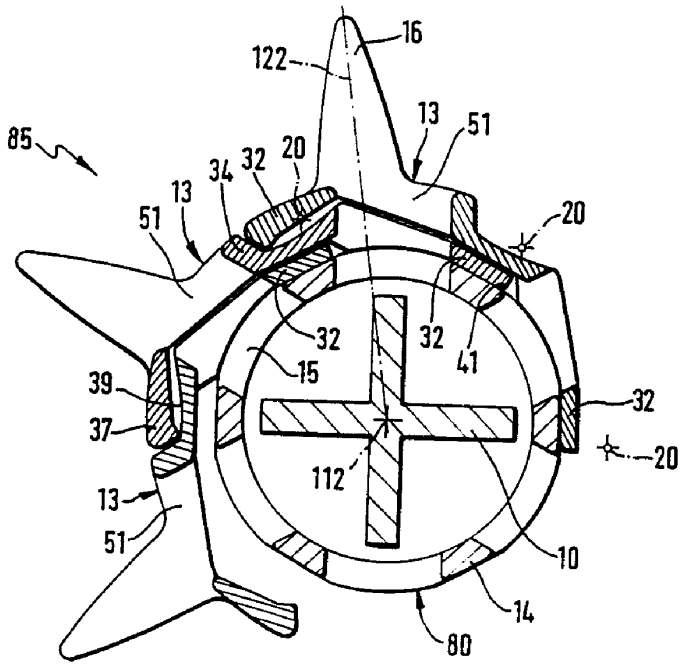
ABSTRACT WO9214378

There is disclosed a hair curler for an apparatus for hair care, said curler having a carrier (80) on which are provided means for guiding a plurality of ridges (13).

The edges (13) can be brought by control means in different positions, to form a hair curler of a variable outer diameter.

Each ridge (13) has on its longitudinal extent a recess (39) with which are assembled by form, in each position of edges, sections of an edge disposed in the vicinity.

Another measure to increase the stability of the hair curler consists of arranging the edges (13) axially movable on the carrier element (80).



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DESCRIPTION WO9214378

Haarpf1egegerät

The invention relates to the general field of hair care appliances, by which devices or

Accessories are meant for shaping and drying of the scalp hair of the user.

The group of hair care devices include, for example hair dryers, Roundst ler, Harm air drying hoods, warm air dry brush, self-powered, gas-powered curling irons or

Curling tongs and curling irons or electrically operated

Curling tongs.

Additional units are, for example resolutions hairdryer and hot air brushes, such as diffusers, air-moving additional brushes with different diameters or curler that can be heatable, for example by means of hot air or by means of a separate state unit.

The invention is based on a winding body for hair care comprising a support member provided on

the means for guidance of several to a longitudinal axis of the support element arranged webs, the webs by means of actuating means can be brought into different positions in order to form a body with different external diameter.

Such winding body, for example, in DE 2529026 Al or

US 3583409 A discloses.

The electric steam styling tongs DE 2529026 Al comprises a hollow cylindrical winding body with a plurality of semicircular tube segments, which are arranged as Spreizlamellen rotatably on the outer wall of the heating tube.

The slats should not be designed as a short circular arc sections, but a semicircle at the optimum solution, ie 180 ° be bent.

However, as a more detailed analysis of Figures 1 and 2 of this patent shows a form locking abutment adjacent slats is tioning in any head, that is in all adjustable diameters of the W ckelkörpers not possible.

By drawing incorrectness, the blades of Figure 2 are significantly shorter than that of Figure 1, but only to give the appearance that the known Vetch for each diameter kδrper a closed shape.

For use as a warm air flowed through brush this Wickelkδrper is not suitable.

Moreover, by the known wound body a not very good approximation of a circular cross-section - achieved - for each diameter.

This known configuration has only a low stability with respect to radially acting forces, as they constantly occur during Haaraufrollen and hair forms in practice.

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A deformation of the winding body during use represents a significant impairment of the value in use.

The curler US 3583409 A consists of several circular segments, which are arranged on the lever arms with an inside, axially movable support element are connected.

Due to the special arrangement of an axial movement of the carrier member causes a radial movement of the individual segments.

Although this arrangement may be appropriate in curlers, however, is not suitable for other applications, for example as air flowed through top for hot air dry brush and the like.

Firstly, the operation of this spreading mechanism requires a free access to the interior of the hair curler, on the other hand provide the axially movable support element and the lever arms a substantial flow resistance in air-flow brush is so that their effectiveness decreases.

Finally, this curler between the individual segments according to the set diameter more or less slots are available due to the structural design, the air-flow brush is in any case extremely disadvantageous since exiting the luftdurchstrδmten brush airflow serve as an independent on the selected diameter of the Wickelkδrpers essentially should.

Although the inner wall of the curler of the known US patent may be disguised by an elastic layer, so that the slots are closed between the individual segments, but raises this elastic layer due to the resulting high demands on ductility at different diameters problems of durability ,

Furthermore, the known curlers can be adjusted only in two stable positions of different diameters.

A continuous or quasi-continuous adjustment of intermediate positions is not possible.

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The invention addresses the problem of providing a bobbin, which is also suitable for use in hot-air devices, such as a curling brush.

The winding body is large standard structurally simple, especially made of plastic injection molded parts to be produced, "have sufficient stability even with large axial dimensions and a closed for each diameter, a circular cylinder jacket approximate shape.

This object is achieved by a winding body having the features mentioned, in which each web has a recess over its longitudinal extent with which the sections are of an adjacently arranged in the web of each positioning of the webs in a form-fitting connection.

By this measure a closed shape of the winding body for each diameter is ensured in an advantageous manner, as well as a sufficient stability is given by the positive connection of adjacent webs.

Finally, the positive connection of the webs of the bobbin provides the prerequisite that the winding body has a least approximately kreiszylinderför strength outer casing for each diameter by a corresponding profiling and shaping of the webs.

The fact that the lands at both the support element are added to pivot bearing is provided for a simple, structural design of the W ckelkörpers.

The space between the bearing positions is free, and therefore represents no increase in the flow resistance of the winding body.

Characterized in that a pivot bearing is provided as bearing formed with open bearing pans, wherein at least one pin of the webs is supported on a circular segment-shaped section of the carrier element, as well as an annular wall of the actuating means, in an extremely advantageous manner the possibility is created to hold together the wound body only by means of snap connections.

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The measure to arrange an axis of rotation of the individual webs in the region of an end portion of a respective web, has the advantage that the webs can be supported on the carrier element additionally.

Extremely advantageous is the embodiment in that the rotation axis is arranged radially offset outside of the profile of the web.

Thereby, the requirement is provided that in the case of bristles, the bristles of the webs protrude largely radially for each diameter of the winding body from Wickelkδrper.

Characterized in that each web edge comprises a pin in the region of a central portion which engages a respective guide curve of the actuating means, which in turn is rotatably mounted on the carrier element, of the webs is provided for the adjustment of different diameters of the winding body for an extremely easy adjustment.

A particularly advantageous embodiment of the known bobbin, which is already adapted by itself to solve the stability problems of known bobbin, consists in that each web is axially slidable with respect to the longitudinal axis of the support element by an amount a.

This enables each support web by means of additional measures related to radially acting external forces on the winding body.

For setting a different diameter of the winding body, the individual webs are achieved by an axial displacement of a force acting in the radial direction form-locking connection to be pivoted to a position of a different diameter.

After completion of the swing operation, the webs are transported back to the axial starting position and again held form-fitting manner by means of radial support.

A particularly advantageous embodiment of these means for the radial support of the bars is set axially the webs via latching means of the adjusting means.

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This according to an advantageous development, a rotation of the webs is performed by means of axial displacement and subsequent rotation of the adjusting means.

Characterized in that the adjusting means are at one end the other end is provided on the carrier element and support means for radial fixing of the bars to the support member, the ribs are at both ends fixed positively in the radial direction for each diameter of the winding body, whereby the stability of the bobbin is increased in an extremely advantageous manner.

A particularly advantageous embodiment of the support means is to provide at each web has a set of teeth arranged in a radial direction, which engages in an edge of a tube portion.

In an extremely advantageous manner each ridge consists of three essentially curved mutually arranged longitudinal bars that are connected by cross-members.

This creates the possibility on the one of the webs of a certain profiling, which allows that the winding body for each diameter has a substantially circular cylindrical outer jacket.

Secondly, there is the possibility of the air outlet between the transverse webs, so that the roller body can be found as an attachment device for a hot air generator application as Hot Air Brush.

This application is advantageously assisted by the fact that the carrier element comprises a tubular section with circumferential apertures, which cooperate with openings formed between the transverse webs, for the purpose of the air outlet.

Characterized in that the transverse webs are provided with extensions borstenför strength, it is possible to use the Wickelkör as by brush.

Characterized in that an outer side of a longitudinal strip of a ridge having an arcuate recess in such a way that in each radial position of the webs an edge, in particular a front edge of the longitudinal bar of an immediately adjacent web form-locking has to the recess, there are two advantages.

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Firstly, each web support over the entire longitudinal extent from on an adjacent web, resulting in an unexpectedly high stability of the whole wound body.

On the other hand is prevented by this measure that possibly flowing through the winding body warm air flows to a greater extent through between the webs would otherwise arise with larger diameters of Wickelkδrpers columns.

The air flowing through the winding body Warm air can be used for any diameter of the winding body only through the openings that are provided lls gegebenenf between the transverse webs, leave.

This measure is already guaranteed the best possible, that the flow resistance of a formed as Hot Air Brush Wiekel remains constant örpers for each diameter in about.

Advantageously, the bottom of a longitudinal bar to adapt to the profile of the top of the other longitudinal bar.

This ensures that adjacent webs in the case of closure of small and the smallest diameter of Wickelkδrpers be able to put together flush.

Advantageous in terms of stability, it that a longitudinal edge of the further longitudinal bar is supported on the outer surface of the tubular section in any position of the webs.

The fact that the support element at least six webs are stored, the calyx-like each other!

ying, being in the position of the smallest diameter, the longitudinal strips of adjacent lands and the openings in the tubular portion and in the region of the transverse webs adjacent webs superimposed!

iegend come to cover, a particularly favorable execution of the winding body regarding the use is specified as a hot air brush.

Is the smallest possible diameter of the bobbin set, the air flowing into the tubular portion of air can through the openings provided therein and through the superimposed!

ying lands whose openings come up with the openings in the tubular portion to cover, unhindered.

The flow resistance is minimal for the smallest diameter of the winding body.

With increasing diameter of the winding body, the longitudinal strips move more and more in front of the openings in the tubular portion, thereby increasing the flow resistance for the leaking out of the winding body warm air to a certain extent.

This measure guarantees in an extremely advantageous manner that the air flow through the winding body is unaffected by each set diameter of the bobbin substantially.

The drying capacity of a vehicle equipped with such a winding body warm air device for hair care is thus largely independent of each set diameter of Wickelkδrpers and can, if present, precisely with those foreseen at the device switching means for varying the speed of a fan motor and to vary the power of an electric or gas-fired heating be set.

Advantageous in terms of simple adjustability of the diameter of the winding body there, that the adjusting means zweidi ensionale guide curves which run spiraüg in a plane perpendicular to the central longitudinal axis plane.

Extremely advantageous to measure the webs of the carrier element in runner systems proves, in a bobbin with the known characteristics at both take.

This results in a structurally particularly simple design, in extremely stable wound body is specified.

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In particular, the design of the support element and the information needed to manufacture injection molding tools to simplify.

Advantageously, the thrust guides are designed as chambers in which sections of the webs are guided form-fitting manner.

Very particularly advantageously suitable for solving the problem of the stabilization of the ridges over their entire length, is the fact that the guide of the webs at an acute angle, in particular at an angle between 10 ° and 80 °, preferably in an angle?

from about 45 ° takes place to the longitudinal central axis.

Thus, the webs are moved in setting of a changed diameter of the winding body not only in the radial direction with respect to the central longitudinal axis of the support element, but also in the axial direction.

The webs are at least in sections guided on an inclined plane, which serves as an abutment with respect to radially acting external impact when using the bobbin.

To this end, at both ends of the support member or inclined surfaces

Formed soils on which guide surfaces of the webs are supported with corresponding bevels.

The individual webs can be supported highly beneficial by ensuring that the tubular portion of the support element further oblique surfaces are formed which correspond to correspondingly shaped guide surfaces of the webs.

Depending on the need and purpose can be formed on the tubular portion, one or more of such bevels that örpers used for additional support of the lands in any position of the webs of wrapping.

By this measure, a particularly stable wound body is created, while still providing the interior of the

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Wickelkδrpers is free of other components, so that unhindered example, air or

Warm air can flow into the winding body.

Characterized in that the adjusting center!

having three-dimensional guide curves, extend in a direction perpendicular to the longitudinal center line plane spiral and with respect to the axial direction of the central longitudinal axis helical rising, a particularly advantageous embodiment of the drive curves of the actuating means is given.

Since the pitch of the helix and the pitch of the helix on the inclined surface guidance of the webs is tailored to the individual webs can be very sure you bring virtually without significant effort, in the desired position.

Characterized in that the adjusting means leitkurvenseitig has a frustoconical recess on the flat webs of corresponding pitch on the supporting element is supported rotatably, an especially advantageous mounting of the actuating means is provided on the carrier element.

To be extremely advantageous and already suitable per se for the known winding body, the conformation of pins at one end of the webs turns, said pins each engage in a guide curve of the actuating means, so that the ribs in both the radial and in the axial result of the actuation of the actuating means direction are positively guided with respect to the longitudinal central axis.

Due to the flexibility of the webs in the axial direction, this can be supported or backed up on inclined planes or similar means for each diameter of the bobbin with respect radial, external stress.

Furthermore, it is advantageous that the other end of the webs an angled nose is integrally formed in the region of the guide surface, which is overlapped by a portion, so that the ribs are positively guided in a channel.

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Firstly, in this way a simple installability of the webs on the supporting element is ensured, on the other, the webs are thus also on the side facing away from the Stel Littel positively guided.

The fact that each web comprises two longitudinal strips, which are connected by transverse webs is ensured with advantage that form the ridges for each diameter of Wickelkδrpers a closed shell of circular cylindrical in shape about.

By this, provided between the transverse webs openings may entering the winding body hot air from this again escape.

For this purpose the support element or a tubular section thereof is advantageously provided with peripheral openings, which cooperate with openings formed between the transverse webs.

Characterized in that the transverse webs have bristle-shaped extensions, is a use of the wound body as a brush or

Hot Air Brush ensures variable diameter.

Especially advantageous is the measure, a longitudinal turns!

eiste the web with a nutformigen recess to provide, into which at least portions of a further longitudinal strip of an adjacent ridge positively in each radial positioning of the webs.

On one hand, thereby the stability of the entire Wiekelkörpers is increased, since each web is supported on or in or on an adjacent land, on the other hand is thereby avoided that introduced into the wound body or air

Can leak warm air between the individual webs by any column.

Thus, can flow only through the provided between the transverse webs of the individual webs openings the warm air so that the air flow rate independently of the set diameter remains

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substantially constant through the warm air charged with winding body.

Characterized in that an edge area of the longitudinal strips comb-like openings which correspond to the openings between the transverse webs of adjacent longitudinal strips, the flow resistance is even with the smallest set diameter of the Wickelkδrpers, wherein the longitudinal strips of a web projecting into the region of the transverse webs of an adjacent web, not increases and thus does not change the air flow rate.

A particularly advantageous embodiment, which is characterized by its simple design, is that the longitudinal strip at least in an axial section in a groove-shaped recess, the bottom of which forms an inclined plane, and extending a form fit on an inclined plane and a corresponding

Sloping surface forming web on the support element is supported.

Thus, the individual webs can be performed outside of the end advantageous to the support member and supported.

Characterized in that the adjusting means is secured therein by means of a cap and integrally formed spring arms on the supporting body by clipping, results in a particularly easy assembly of the winding body.

It is advantageous also to place a button in a central recess of the cap, which causes the spread of a spring element which engages in an annular groove of a pilzfδrmigen area of the supporting body.

By this measure, a simple, releasable coupling between the winding body and supporting body is specified.

The Wickelkorper can be removed by simply pressing the button so readily, for example for cleaning or replacement with another wound body from the support body.

Advantageously, this is winding body with a variably adjustable diameter application as curlers,

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brush attachment of a hot-air hair-care appliance or hair treatment portion of an electric or gas-powered curling iron use.

Further advantages of the invention will become apparent from the following description of the embodiments and the figures.

Shown are:

FIG. 1 shows a conventional, well-known hot-air hair-care appliance, type AS 13, manufacturer Braun AG,

Fig. 2 is a longitudinal section through the head of the winding body of a first embodiment,

Fig. 3 is a continuation of the section of FIG. 2 by the foot of the winding body,

Is a longitudinal section corresponding to FIG. 2, but rotated FIG. 4 by approximately 90 °,

Fig. 5 shows a cross section through the head of the winding body according to VV of Fig. 4, wherein the adjusting means is shown partially broken away, Fig. 6 a longitudinal section through the foot of the winding örpers, opposite the section of FIG. 3 is rotated by 30 °,

7 shows a cross section through the winding body of the first embodiment with the smallest possible diameter,

Fig. 8 shows a cross section through the Wickelkδrper according to FIG. 7 with the largest adjustable diameter,

Fig. 9 is a longitudinal section through the head of the Wickelkδrpers according to a second embodiment,

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FIG. 10 is a continuation of the section shown in FIG. 9 by the foot of the winding body,

Fig. 11 is a cross-section according to XI-XI of Fig. 10,

Fig. 12 is a cross section through the winding body of the second embodiment according to XII-XII of Fig. 10, each two webs are shown in the position of the smallest and largest diameter,

Fig. 13 is a plan view of the head end of the carrier element means at remote Stel,

Fig. 14 is a cross section through a single web in accordance with the Interf XIV-XIV of FIG.

10

FIG. 15 is a plan view of the parking edium with three-dimensional guide curves.

In Fig. 1, a known hot-air-driven hair-care appliance is illustrated, for which the wound body as described in the article is further advantageously used.

However, the application is not limited to hot air driven hair care appliances, but extends to any winding body for hair care.

The hot-air device comprises two housing parts 62 which receive inside an engine 66 and a heater 64 for producing hot air, via a power cord 68 which electrically powered units to the power supply can be connected.

The connection of the power cord 68 with the housing is rotatable about 74 contacts.

A voltage selector 78 allows the use of the device to power supply systems with different voltage.

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By means of a slide switch 84 is provided in the housing a switch 82 operable, so that the device can be handled in different operating states.

The housing parts 62 comprise a cylindrical projection of a mandrel 10, which protrudes from the head side of the chassis.

At the base of the mandrel is a coupling ring 72 which is under the tension of a compression spring 76 is disposed.

The mandrel 10 serves for rotatably supporting a brush 85 which is secured axially by means of a knob 50 on the mandrel 10.

When switched on, the motor drives 66 to a not shown fan, so that an air current is produced which can be heated by the heater 64.

At the base of the mandrel 10 of the air flow exits through openings provided therein and flows through the brush 85th

By the brush 85 in the peripheral side openings provided emerges from this air flow and comes into contact with the rolled or wound on the brush hair 85, to form and to dry this.

By means of the coupling ring 72 is the brush 85 can be unlocked and can be easier to handle on the mandrel 10 to rotate freely.

For the purpose of decreasing the brush 85, the knob 50 can be removed by rotation.

Thus, the brush can be cleaned, if necessary 85 or replace it with another brush 85 different diameter to form larger or smaller curls.

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In the figures 2-8 a first embodiment of a variable diameter Wickelkδrpers is shown in different views.

The winding body is placed on the mandrel 10 of the hot air care unit and on a pilzformigen portion 52 of the mandrel 10 is fixed by means of a spreading spring 53.

These expanding spring 53 can be opened by integrally formed on the button 50 inclines 40, so that the Wickelkδrper from the mandrel 10 is detachable.

The knob 50 is axially displaced in a cap 30.

The bevels 40 of the knob 50 will expire in two guide webs 60, are guided in the grooves 70 (FIG. 5) of a support element 80.

With this structure, the lock, the brush 85 is secured axially and can rotate freely on the mandrel 10, if it is not fixed radially by a clutch ring 72 (Fig. 1).

The Wickelkδrper consists of the support member 80 to which the head end, a flange 17 is integrally formed.

The flange 17 serves for the rotatable mounting of the webs 13 which are optionally provided with integrally molded bristles 16.

As can be seen particularly in FIG. 5, the storage of the webs 13 by integrally molded pins 18, 19 is formed, which interact with kreisseg entförmigen areas 21 on the flange 17.

This storage is completed by integrally formed tabs 26 on the pins 18 which cooperate with a circumferential topffδrmigen on a inner wall of the adjusting ring designed as actuating means 23 groove 27.

Above the flange 17 is a splined profile 22 (Fig. 2, 3) is attached which cooperates with a

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corresponding profile 23 on the control edium.

The actuator 23 has on its side facing the webs 13 corresponding to the number of guide curves 24, in which the webs 13 on the ends integrally formed pins 25 (Fig. 4) or

Steering arms are out.

The pins 18, 19 of the webs 13 are increased by the dimension A with respect to the circular-segment-shaped portions 21 of the flange 17.

By the cooperation of the nose 26 and the groove 27, the webs 13 in the axial direction are positively connected to the actuating means 23 and can be moved by the dimension A in the axial direction together with this.

If the control means 23 displaced against the action of a spring 28, is disengaged so the profile of the 22nd

The actuator 23 may now be rotated as far as this allow the rails 24 towards the pin.

In a tubular portion 14 of the carrier element 80 has a plurality of apertures 15 are circumferentially provided, from which optionally warm air can escape.

The winding body is altogether arranged concentrically to a central longitudinal axis 112 of the mandrel 10.

As shown in FIG. 3, the winding body is on the covers of the housing part 62 facing the end of a tubular portion 49.

At the end facing away from the winding body of the tubular region 49, the latter has a spur

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toothing 42 which serves to cooperate with a corresponding toothing on the housing and for preventing rotation of the winding body (corresponding coupling ring 72).

The tubular portion 49 is possibly the air flow of the hot air flow in the winding body and the storage of the webs 13 facing away from the open bearing sockets (pin 18, 19, 21 range) end.

To this end are integrally formed, torpedoför owned bearing 12 for the webs 13 via webs 11 with the tubular portion 49 in connection.

The pivot bearing 12 go to the central axis 112 integrally in the tubular portion 14 through which extends into the head area of the Wickelkδrpers.

The torpedoför strength bearing 12 take pin 46 of the webs 13, whereby the pins 46 are at small steering arms 13 of the webs integrally formed in one piece.

To vary the diameter of the winding body the actuating means 23 is moved against the action of the spring 28, so that the profile 22 is disengaged.

The collar 23 can be rotated to the extent this is permitted by the rails 24 with respect to the pin 25.

The division of the profile 22 is chosen such that a plurality of re-entry options for the profile 22 are present within said range of rotation.

In this way, the desired different Wickelkδrperdurchmesser can be set.

The axial displaceability of the webs 13 and the adjusting means 23 permits the webs 13 on the side facing away from the actuating means 23 can also be supported against radial stress.

This is accomplished with the aid of a set of teeth 29 (Fig. 3, 6) which is integrally formed laterally of the first geräteseit gene bristle 16 or the web 13, accomplished.

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This set of teeth 29 is adapted to the pitch of the profile 22 and engages with the respective adjustable bobbin diameters in an upper edge 48 of tube portion 49.

By this measure, the webs 13 are supported at both ends of Wickelkδrpers against radial, external loads in any adjustment of the diameter of the winding body and achieve a good stability.

In the illustration of Fig. 4, which shows a rotated by approximately 90 ° in the section plane with respect to FIG. 2, like parts are designated by like reference numerals.

In particular, it can be seen from this figure, that the spring 28 is supported in the inner bottom of the cap 30, the cap 30 by means of integrally formed spring arms 31 engages in the corresponding openings of the support element 80.

The mounting of the webs 13 in the head-side region of the Wickelkδrpers is further illustrated by the representation of FIG. 5, in the right part of the adjusting means 23 is not shown.

The open, in particular for a plug-in assembly of the webs 13 suitable socket bearing is formed by the integrally formed on the pin strips 18 and 19 and the circular-segment-shaped portion 21 on the flange 17.

An additional guide to get the pins 18 and 19 in that they rest against the annular inner wall of a recess in topffδrmigen adjusting means 23 or in an existing groove 27 there.

The pins 25 are guided in the guide curves 24 (left side of Figure 5), so that rotation of the actuating means 23 13 leads to a rotary motion of the webs to an apparent also from Fig. 7 and 8, the rotational axis 20.

In FIG. 6, the interaction of the teeth 29 will be explained with the edge 48 of the barrel portion 49 in a longitudinal section through the foot of the brush.

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When setting a changed diameter of Wickelkδrpers the webs 13, shifted by a dimension A, which roughly corresponds to the tooth depth of the teeth 29 toward the head end of Wickelkδrpers.

The teeth 29 then no longer intervenes in the edge 48, so that the webs 13 due to the rotational movement of the actuating means 23 around the rotation axis 20 can rotate freely.

After completion of the rotational movement of the webs 13 are pushed back axially by the action of the spring 28, wherein a different set of teeth 29 engages the edge 48.

The tooth pitch of the teeth 29 is matched to the profile 22 on the support element 80 and the locking means 23.

Thus, at the foot end of the bobbin each ridge 13 is positively fixed and secured against compounds due to radial loads.

From the figures 7, 8, the cross-sectional profile of the individual webs 13 and the arrangement of these webs 13 of the support element 80 is with respect to more apparent.

The webs 13 consist of a first longitudinal strip 32, which is connected via a number of cross-members 33 having a second longitudinal strip 34.

Between the transverse webs 33 air outlet openings are provided which correspond to the provided on the tubular portion 14 of the support element 80 openings 15.

The bottom 35 of the second longitudinal bar 34 has such a shape that this underside 35 rests form-fitting manner on the top of the first longitudinal bar 32 at the smallest adjustable diameter of the winding body.

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The outer side 36 is curve-shaped, so that in particular a convex recess 39 is present over the entire extent of the second longitudinal strip.

At this second longitudinal bar 34 is followed by further transverse webs 51, which may be partially or completely provided with bristles 16.

These transverse webs 51 provide the connection with the second longitudinal bar 34 with a third longitudinal strip 37 here, wherein between the transverse webs 51, openings are provided preferably in turn, corresponding to the openings between the cross-members 33 and the openings 15.

The longitudinal strips 32, 34 and 37 are arranged at an obtuse angle to each other so that each individual web 13, consisting of the longitudinal strips 32, 34 and 37 and the provided therebetween transverse webs 33 and 51, assumes an arcuate shape approximately.

The shape of the recess 39 is extremely advantageous in particular designed such that a front edge 38 of the longitudinal bar 37 abuts form-fit for each diameter of the wound body on the outer side 36 of the recess 39.

Characterized in that the rotational axis 20 of the webs 13 slightly radially offset outwardly beyond the longitudinal bar 32 is located, is achieved on the one hand, that the webs continuously support 13 in any rotational position with the longitudinal edge 41 of the longitudinal bar 32 on the tubular portion 14.

On the other hand this measure provides the positioning of the rotation axis 20 outside the profile of the ridges 13, the guarantee that the bristles 16 of the central longitudinal axis 112 oriented in any rotational position of the bars at least approximately radially with respect to.

In summary, 13 can be characterized as the profiling of the webs, that each web 13 is shaped so that irrespective of the rotary position of the webs 13 on the one hand form-locking between the longitudinal strip 32 and the tubular portion 14 and on the other hand form-locking between a leading edge 38 of the longitudinal bar 37 as well as the outside 36 of the recess 39 of an adjacent ridge 13 is.

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This provides a very stable bobbin is specified, which is highly resistant to radial loads.

Another criterion for the design of the recesses 39 is that this longitudinal strip 37 of an adjacent ridge 13 substantially completely absorbs in the case of the smallest set the diameter of the winding body, and in such a manner that the outer shell of the winding former, apart from the bristles 16, virtually assumes circular shape.

The openings between the cross-members 33 and 51 join the apertures 15 in the tubular portion 14 of the support element 80 in the case of the smallest set the diameter of the winding body practically to coincide, so that, by in this setting, the lowest Strδmungswiderstand for from the interior of the tubular portion 14, the openings outflowing hot air is.

If the diameter of the winding body is increased by rotation of the actuating means 23, then the longitudinal rib 32 pushes partially between the openings 15 of the tubular portion 14 and the opening between the transverse webs 51st

As demonstrated by practical experiments, it is ensured by this measure in a surprising manner that the air flow is virtually independent of the currently set diameter of the bobbin through the openings of the bobbin.

A putative explanation is that an increase in diameter of the winding body leads in itself to a lesser Strδmungswiderstand, this is but increased by partially immersing the longitudinal bar 32 in the outlet area of the hot air back to the original, present the smallest diameter value.

Similarly, the longitudinal strip 37 which partially pushes for increasing the diameter before the opening between the transverse webs 33 acts.

The outer casing of the bobbin takes for the largest adjustable diameter of approximately circular shape, if one disregards the indentations in the region of the recesses 39.

With respect to the determination of the rotation axis 20 should also be noted that it is fixed for a mean diameter of the winding body such that the connecting line between the rotational axis 20

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and the central longitudinal axis 112 forms about a right angle to the bristle axis 122.

In this case the bristles 16 are largely radial from the brush 85, regardless of the respective diameter of the bobbin decreases.

Overall, an extremely stable, extremely strong structure is created by this construction of the bobbin whose diameter is variable.

Largely independent of the setting of the respective diameter of the bobbin is the length of the bristles 16, its radial position with respect to the central longitudinal axis 112 of Wickelkδrpers.

In the case of the use of Wiekelkörpers as warm air flowed through brush and the air flow rate and thus the temperature is essentially independent from each set diameter.

The individual webs 13, which engage over each other in each rotational position, are mounted parallel to the central longitudinal axis 112 and form for the different diameters substantially lateral surfaces circular in shape, so that the deviation from the ideal circular shape is minimized.

The entire winding body is structurally designed such that it can be mounted only on snap-on connections and the items are produced by injection molding in high volume.

In Figures 9 to 15, another embodiment of the erf ndungsgemäßen bobbin is illustrated, with the first embodiment, similar parts are provided with identical reference numerals.

In the following, only the differences from the first embodiment will be explained in more detail.

Notwithstanding the two-dimensional guide curves 24 of the adjusting means 23 according to the first embodiment, the adjusting means 23 (Fig. 9, 15) in the present three-dimensional guide curves 24.

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The guide curves 24 extend one hand in a spiral to the central axis 112 perpendicular plane.

In particular, the guide curves 24 take the form of Archimedean spirals.

Moreover, the guide curves 24 and the bottom surfaces 56 in the axial direction (longitudinal center line 112) a helical course, with the slope of the guide curves 24 has been selected in the radial and axial direction equal to ge in the present embodiment.

However, it is equally possible to provide different gradients in radial and axial direction, the guides of the ridges 13 adapted accordingly.

An integrally formed on the webs 13, pin 25 is guided in the guide curve 24 along a path that runs on a central longitudinal axis 112 concentric conical surface, whose generatrix forms an angle of in particular 45 ° with the central longitudinal axis 112.

An equal angle to the central longitudinal axis 112 also exhibit on the webs 13 integrally formed guide surfaces 95, 96 and 97.

This Führungsfl surfaces 95, 96 and 97 act on each web 13 thereby together with corresponding Schrägfl surfaces 98, 99 as well as a bottom 94, which in turn are integrally formed on the support member 80.

These inclined surfaces 98, 99 and the bottom 94 also form an angle of approximately 45 ° with respect to the central longitudinal axis 112th

In order to adjust the diameter of the winding body the actuating means 23 is rotated, this being locked in different positions by means of a detent ball 54.

"Due to the engagement of the pin 25 of the webs 13 in the rails 24, the webs 13 are driven, and that includes on a track in this particular case an angle of 45" with the central longitudinal axis 112.

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According to the present embodiment, each ridge 13 is in fact supported the two end regions and in the central region against radially acting from the outside on the winding body forces in three areas.

Depending on the version of the bobbin and the intended use can be supplemented by other support sections omitted under certain circumstances the central support section or.

The actuator 23 has a kegelstumpfförmige, central recess 114, in whose inner circumferential surface the rails 24 are placed.

The circumferential surface of the recess 114 cooperates with webs 110 which are integrally formed on the support member 80.

These webs 110 have a slope of the conical surface of the recess corresponding slope 114 and used one hand to support and rotatably supporting the actuating means 23, on the other hand, the webs form 110 pairs chambers 92, in which the webs 13 or

Parts of the molded pin 25 in the radial direction, such as shown in Fig. 13 it can be seen, are guided.

If the diameter of the winding body made larger, the individual webs 13 are driven in radial and axial direction and moving in a path which forms an angle of about 45 ° with respect to the central longitudinal axis 112.

The angle of 45 "can of course also be varied in a range between 10 and 80 ° according to individual requirements.

If a smaller diameter of the Wickelkörpers set, causes the radial force acting from the guide curves 24 on the pin 25 inwardly towards the central longitudinal axis 112 power, that the webs 13 with the corresponding guide surfaces 95, 96 and 97 at an angle to slide inwardly and thus also of the

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bottom surface 56 of the guide curves 24 follow.

The support of the webs 13 at the central portion of the support element 80 and the tubular portion 14 can be seen in particular from FIG. 12.

Attached below on each web 13 in this section, an angle to the central longitudinal axis 112 extending guide surfaces 96 a integrally formed on the tubular portion 14 inclined surface extends 99 on which the web 13 after a change of the diameter of the winding body slides down as on an inclined plane and is pushed up ,

This inclined plane provides for each diameter of the winding body for a support of the webs 13 in the center region with respect to acting from outside on the webs 13 forces at each set diameter of the winding body.

At the base of the Wickelkδrpers, the carrier element 80, as illustrated particularly in Figure 10, 11 and 12 can be seen, six slit-like chambers 90 on whose bottom 94 also extends in the preferred angle of about 45 ° to the central longitudinal axis 112.

Each chamber 90 is formed by two integrally formed on the support member 80 side walls 44.

The webs 13 have end portions which are provided with guide surfaces 97, which are guided in the chambers 90.

To 13 forcibly feeds the webs in the radial direction, the ends of the webs 13 in the region of the guide surface 97 angularly projecting tabs 86 (see Fig. 11), which are out of print by a section 88 of the tubular portion 49.

By this measure, between the bottom 94 of the carrier element 80 and the portion 88 of the barrel portion 49 is a channel 116 formed in the nose 86 of the webs 13 is positively guided on a 45 "inclined path.

12 As can be seen from Fig., Secure small angled pin 58 of the barrel portion 49 at this support

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member 80 in that the pins 58 cooperate with grooves 59.

By this measure, an extremely easy installation of bridges 13 is ensured on the carrier element 80.

The individual webs 13, the in FIG. 12 or

Fig. 14 visible profiling.

A first longitudinal strip 102 is connected via transverse webs 118, which can be provided with bristles 16 optionally having a second longitudinal strip 106.

Between the transverse webs 118 openings are provided in the web 13 that correspond with corresponding openings 15 in the tubular section 14 so that, for example, hot air can escape from the winding body.

The longitudinal bar 106 comprises a substantially arrow-shaped form, wherein the arrow tip is connected to the transverse webs 118.

Edge side, the longitudinal bar is provided with slots 106 108, so that the edge region takes a comb-like shape about.

The longitudinal strip 106 is positively guided in a longitudinal groove formed as a recess 104 of longitudinal bar 102 an immediately adjacent web 13.

In particular from FIG. 12 can be seen, the longitudinal strip 106 emerges at the slightest set diameter of the bobbin deep into the longitudinal groove 104 of the longitudinal bar 102 and extends partially into the openings between the transverse webs 118th

The slots 108 are now arranged on the longitudinal bar 106 that these substantially correspond

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with the apertures between the transverse webs 118 and therefore no appreciable increase in the flow resistance for small diameters of the winding body occurs.

Is the diameter of the Wickelkδrpers increased by rotation of the actuating means 23 so as to slide, the longitudinal bar 106 from the recess 104 of the cross bar 102 of an adjacent web 13 largely out.

Regardless of the diameter is therefore in each of the positioning ribs 13 fit between adjacent fins, so that this embodiment of the bobbin according to the invention has a high stability against radial loads.

In addition, the webs 13 are guided at least at both ends on inclined planes, which is made possible by the axial displaceability of the webs in combination with the three-dimensional guide curve 24 of the actuating means 23.

To improve the stability, one or more inclined planes in the central region of the webs on, "the tubular portion 14 may be provided as required.

As shown particularly in Fig. 12 is seen, also this winding body in a winding diameter for all essentially circular circumferential surface.

Arise only for larger diameters of Wickelkδrpers between adjacent ridges 13 längsnutartige wells with a depth corresponding to about one third of the thickness of the web 102.

In addition to the extremely good stability, this Wickelkδrper distinguished by its ease of manufacturability and is also well suited for use as a hot air brush.

The bristle axis 122 of the optionally provided bristles 16 are shown in FIG. 12, although a slight deviation from the exact radial alignment, but this deviation of a few degrees is negligible for practical use of such a bobbin.

Both Ausführunsformen of the winding body of the invention have their own advantages, but in the

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case that the stability point of view of the winding body is in the foreground, the second embodiment is preferable because it is readily possible here to provide as many Abstützflachen as needed in the center area of the webs 13 ,

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CLAIMS WO9214378

Claims

First winding body for hair care comprising a support member (80) on which means for guiding of several to a central longitudinal axis (112) of the carrier element (80) arranged webs (13) are provided, said webs (13) by means of adjusting means (23) in different positions can be brought to form a body with different external diameters, da.- characterized in that each web (13) has a recess (39, 104) over its longitudinal extent with which the sections of an adjacent web (13) in each positioning of the webs form-fitting are connected.

2. winding body according to claim 1, characterized in that the webs (13) at both ends of the carrier element (80) in pivot bearings (18, 19, 21; 12, 46) are accommodated.

3. Wickelkδrper according to claim 2, characterized in that a pivot bearing is provided as bearing formed with open bearing pans, wherein at least one pin (18, 19) of the webs (13) on a circular segment-shaped section of the carrier element (80) and on an annular wall of the actuating means (23) is mounted.

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4. Wickelkδrper according to any one of the preceding claims, characterized in that an axis of rotation (20) of the web (13) in the region of an end portion of the web (13) is arranged.

5. Wickelkδrper according to claim 4, characterized in that the rotational axis (20) offset radially arranged outside the profile of the web (13).

. 6

Winding body according to claim 1 or 2, characterized in that each web (13) in the region of a central portion (34) on the edge side a pin (25) which engages in a respective guide curve (24) of the actuating means (23) which in turn rotatably is fixed on the support element (80).

7. winding body according to the preamble of claim 1 or according to claim 1 or 2, characterized in that each web (13) is axially displaceably mounted with respect to the longitudinal axis of the support element (80) by an amount (A).

8. winding body according to claim 7, characterized in that the web (13) via latching means (26, 27) on the actuating means (23) fixed in the axial direction.

9. Winding body according to one of the preceding claims, Danish characterized by that a rotation of the webs (13) by means of axial displacement and subsequent rotation of the actuating means (23) is feasible.

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10. Winding body according to one of claims 7 to 9, characterized in that the adjusting means at one end on the carrier element (80) and support means (29, 48) for radially fixing the webs (13) are at the other provided on the carrier element (80).

11. Winding body according to claim 10, characterized in that the support means (29, 48) through <'> a on the web (13) running in the radial direction of teeth (29) are formed which in an edge (48) of a tube portion (49) intervene.

12. Winding body according to claim 1, characterized in that each web (13) consists of three substantially arc-shaped to each other are arranged longitudinal bars (32, 34, 37) which by transverse webs (33, 51) are interconnected.

. 13

W lid örper according to claim 12, characterized in that the carrier element (80) comprises a tubular portion (14) with circumferential apertures (15), cooperating openings formed with between the transverse webs (33, 51) for the purpose of the air outlet.

14. Wickelkδrper according to claim 12 or 13, characterized in that the transverse webs (51) are provided with bristle-shaped extensions.

15. Wickelkδrper according to any one of the preceding claims, characterized in that an outer side (36) a longitudinal bar (34) of a web (13) has an arcuate recess (39) such that in any radial position of the webs (13) an edge, in particular a leading edge (38) of the longitudinal strip (37) of a directly adjacent web (13) form-locking to the recess (39).

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16. Wickelkδrper according to one of claims 12 to 15, characterized in that the underside (35) of a longitudinal bar (34) is adapted to the profile of the upper side of the further longitudinal bar (32).

17. Winding body according to one of claims 12 to 16, characterized in that a longitudinal edge (41) of the cross bar (32) on the outer surface of the tubular portion (14) in any position of the webs (13) is supported.

18. Wickelkδrper according to any one of the preceding claims, characterized in that on the carrier element (80) has at least six webs (13) are mounted, the calyx-like successive!

Laying, wherein in the position of the smallest diameter, the longitudinal bars (32, 34, 37) of respectively adjacent webs (13) and the openings (15) in the tubular portion (14) and in the region of the transverse webs (33, 51) of adjacent webs (13) one above the other!

iegend come to cover.

19. Winding body according to one of the preceding claims, characterized in that with increasing diameter of the winding body are longitudinal strips slide (32, 34, 37) more and more in front of the openings (15) in the tubular portion (14) of the carrier element (80).

20. Winding body according to one of the preceding claims, characterized in that the adjusting means (23) two-dimensional guide curves (24), which extend in a spiral to the central longitudinal axis (112) vertical plane.

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21, winding body according to the preamble of claim 1, characterized in that the webs (13) at both ends of the support member (80) are received in sliding guides.

22, winding body according to claim 21, characterized gekennzei HNET that the thrust bearings as chambers (90, 92) are formed in which portions of the webs (13) are positively guided.

23 Wickelkδrper according to claim 21 or 22, characterized in that, the guidance of the webs (13) at an acute angle, in particular at an angle between 10 ° and 80 °, preferably at an angle of approximately 45 ° relative to the longitudinal central axis (112) ,

24, winding body according to claim 23, characterized in that both ends of the carrier element (80) oblique surfaces (98) or

Floors (94) are formed, on which are supported guide surfaces (95, 97) of the webs (13) with corresponding slope.

25th

Winding body according to claim 23 or 24, characterized in that the tubular portion (14) of the carrier element (80) more inclined surfaces (99) are formed, correspond with correspondingly shaped guide surfaces (96) of the webs (13).

26 winding örper according to any one of claims 1, 21 to 25, characterized in that the adjusting

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means (23) three-dimensional guide curves (24) which in a plane perpendicular to the central longitudinal axis (112) plane spiral and in relation to the longitudinal central axis of helical pitch run, the ratio of the pitch of the helix to the pitch of the screw in particular assumes such values, which result from the tangent of the angle of the web guide.

27 Wickelkδrper according to claim 26, characterized in that the adjusting means (23) leitkurvenseitig has a frustoconical recess (115) and two-dimensionally on lands (110) supported on the carrier element corresponding slope (80) rotatably.

28 Wickelkδrper according to the preamble of claim 1 or any of claims 21 to 27, characterized in that one end of the webs (13) integrally formed pins (25) each in a guide curve (24) of the actuating means (23) engage, wherein the webs (13) are positively guided both in the radial and in the axial direction with respect to the longitudinal central axis (112) as a result of actuation of the actuating means (23).

29 Wickelkδrper according to claim 28, characterized in that the other end of the webs (13) is formed an angled nose (86) in the region of the guide surface (97) which is overlapped by a section (88), so that the webs (13) in a channel (116) are guided form-fitting manner.

30th

Winding body according to one of claims 1, 21 to 29, characterized in that each web of two longitudinal strips (102, 106) which are interconnected by transverse webs (118).

31, winding body according to claim 30, characterized in that the carrier element (80) comprises a tubular portion (14) with circumferential apertures (15), cooperating openings formed with between the transverse webs (118) for the purpose of the air outlet.

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32. Winding body according to one of claims 30, 31, characterized in that the transverse webs (118) with bristle-shaped extensions (16) are provided.

33. Winding body according to one of claims 1, 21 to 32, characterized in that a longitudinal bar (102). of the web (13) has a groove-shaped recess (104) into which at least sections of the longitudinal strip (106) of an immediately adjacent web form-fitting manner in each radial position of the webs (13) engage.

34. Wickelkδrper according to any one of claims 30 to 33, characterized in that an edge area of the longitudinal strips (106) arranged comb-like slots (108), which correspond to the openings between the transverse webs (118).

35. Winding body according to one of claims 30 to 34, characterized in that the longitudinal bar (106) at least in an axial portion a groove-shaped recess (96) forming an inclined plane at the bottom has, and is a form fit on an a corresponding inclined plane or inclined surface (99) forming web is supported on the carrier element (80).

36th

Örper winding according to one of the preceding claims, characterized in that the adjusting means (23) by means of a cap (30) formed thereon and the spring arms (31) is secured to the carrier element (80) through clipping.

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37. Winding body according to claim 36, characterized in that a central recess of the cap has a knob (30) receives, causes the spreading of a spring element (53) which engages the support member (80) in an annular groove of a pilzformigen region (52).

38. Wickelkδrper according to any one of the preceding claims, characterized by its use as a hair curler with variably adjustable diameter.

39. Wickelkδrper according to one of claims 1 to 37, characterized by its use as a brush attachment of a warm-air hair care appliance with variably adjustable diameter, wherein the carrier element (80) is flowed through by hot air.

40. Wickelkδrper according to any one of claims 1 to 37, characterized by its use as a hair treatment portion of an electrically or gas powered curling iron with variably adjustable diameter.

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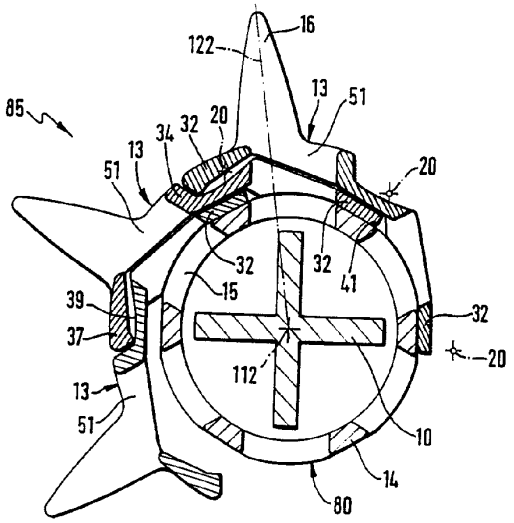
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(54) Bezeichnung: HAARPFLEGEGERÄT

(57) Abstract

Described is a curler for a hair-care appliance, the curler having a bearer element (80) fitted with means for mounting several strips (13). The strips (13) can be brought into various positions by means of adjusting means in order to vary the external diameter of the curler. Each strip (13) has a recess (39) extending along the whole of its length, and the sections of an adjacent strip physically interlock with the recess when the strips are in the appropriate position. An additional feature designed to increase the stability of the curler is the fact that the strips (13) are mounted on the bearer element (80) so that they can be moved longitudinally.



(57) Zusammenfassung

Es wird ein Wickelkörper für ein Haarpflegegerät beschrieben, der ein Trägerelement (80) aufweist, an dem Mittel zur Führung von mehreren Stegen (13) vorgesehen sind. Die Stege (13) sind mittels Stellmitteln in unterschiedliche Positionen bringbar, um einen Körper mit unterschiedlichem Außendurchmesser zu bilden. Jeder Steg (13) weist eine Aussparung (39) über seine Längserstrekkung auf, mit der die Abschnitte eines benachbart angeordneten Steges in einer jeden Positionierung der Stege formschlüssig in Verbindung stehen. Eine weitere Maßnahme zur Erhöhung der Stabilität des Wickelkörpers besteht darin, die Stege (13) axial verschiebbar am Trägerelement (80) anzuordnen.

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Haarpflegegerät

Die Erfindung betrifft das allgemeine Gebiet der Haarpflegegeräte, worunter Geräte bzw. Zusatzgeräte zum Formen und Trocknen der Kopfhaare des Anwenders zu verstehen sind. Zu der Gruppe der Haarpflegegeräte gehören beispielsweise Haartrockner, Roundstyler, Warmlufttrockenhauben, Warmlufttrockenbürsten, stromunabhängige, gasbetriebene Lockenstäbe bzw. Lockenbürsten sowie elektrisch betriebene Lockenstäbe bzw. Lockenbürsten. Zusatzgeräte sind beispielsweise Vorsätze für Haartrockner und Warmluftbürsten, wie zum Beispiel Diffusoren, luftdurchströmbare Zusatzbürsten mit jeweils unterschiedlichem Durchmesser oder auch Lockenwickler, die beispielsweise mittels Warmluft oder mittels eines separaten Standgerätes beheizbar ausgebildet sein können.

Die Erfindung geht aus von einem Wickelkörper zur Haarpflege mit einem Trägerelement, an dem Mittel zur Führung von mehreren um eine Längsachse des Trägerelements angeordneten Stegen vorgesehen sind, wobei die Stege mittels Stellmitteln in unterschiedliche Positionen bringbar sind, um einen Körper mit unterschiedlichem Außendurchmesser zu bilden.

Derartige Wickelkörper sind beispielsweise in der DE 25 29 026 A1 bzw. US 3 583 409 A offenbart. Der elektrische Dampffrisierstab der DE 25 29 026 A1 weist einen hohlzylindrischen Wickelkörper mit mehreren halbkreisförmigen Rohrsegmenten auf, die als Spreizlamellen drehbar an der Außenwandung des Heizrohres angeordnet sind. Die Lamellen sollen nicht als kurze Kreisbogenabschnitte ausgebildet sein, sondern bei der optimalen Lösung halbkreisförmig, d.h. um 180° gebogen sein. Wie jedoch eine genauere Analyse der Figuren 1 und 2 dieser Offenlegungsschrift zeigt, ist ein formschlüssiges Anliegen benachbarter Lamellen in jeder Posi-

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tionierung, das heißt bei allen einstellbaren Durchmessern des Wickelkörpers nicht möglich. Durch eine zeichnerische Unkorrektheit, die Lamellen der Figur 2 sind erheblich kürzer als die der Figur 1, wird vielmehr nur der Anschein erweckt, daß der bekannte Wickelkörper für jeden Durchmesser eine geschlossene Form aufweist. Für den Einsatz als warmluftdurchströmte Bürste ist dieser Wickelkörper nicht geeignet. Darüber hinaus wird durch den bekannten Wickelkörper eine nicht sonderlich gute Annäherung an einen kreisförmigen Querschnitt - für jeden Durchmesser - erreicht. Diese bekannte Ausgestaltung besitzt eine nur geringe Stabilität in bezug auf radial wirkende Kräfte, wie sie beim Haaraufrollen und Haarformen in der Praxis ständig auftreten. Eine Verformung des Wickelkörpers während der Benutzung stellt eine erhebliche Beeinträchtigung des Gebrauchswertes dar.

Der Lockenwickler der US 3 583 409 A besteht aus mehreren Kreissegmenten, die über Hebelarme mit einem im Inneren angeordneten, axial verschiebbaren Trägerelement verbunden sind. Aufgrund der speziellen Anordnung bewirkt eine axiale Bewegung des Trägerelementes eine radiale Bewegung der einzelnen Segmente. Diese Anordnung mag zwar bei Lockenwicklern angebracht sein, ist jedoch für andere Anwendungen, beispielsweise als luftdurchströmter Aufsatz für Warmlufttrockenbürsten und ähnliches ungeeignet. Zum einen erfordert die Betätigung dieses Spreizmechanismus eine freie Zugänglichkeit zum Inneren des Lockenwicklers, zum anderen stellen das axial verschiebbare Trägerelement sowie die Hebelarme einen erheblichen Strömungswiderstand bei luftdurchströmten Bürsten dar, so daß deren Effektivität sinkt. Schließlich sind aufgrund des konstruktiven Aufbaues dieses Lockenwicklers zwischen den einzelnen Segmenten je nach eingestelltem Durchmesser mehr oder weniger große Schlitze vorhanden, die jedenfalls für luftdurchströmte Bürsten äußerst nachteilig sind, da die aus der luftdurchströmten Bürste austretende Luftmenge im wesentlichen unab-

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hängig vom eingestellten Durchmesser des Wickelkörpers sein sollte. Zwar kann die Innenwand des Lockenwicklers des bekannten US-Patents mittels einer elastischen Schicht verkleidet sein, so daß die Schlitze zwischen den einzelnen Segmenten verschlossen sind, doch wirft diese elastische Schicht aufgrund der auftretenden hohen Anforderungen an die Dehnbarkeit bei unterschiedlichen Durchmessern Probleme hinsichtlich der Haltbarkeit auf. Weiterhin kann der bekannte Lockenwickler lediglich in zwei stabile Positionen unterschiedlichen Durchmessers eingestellt werden. Eine kontinuierliche bzw. quasi kontinuierliche Einstellung von Zwischenpositionen ist nicht möglich.

Der Erfindung liegt die Aufgabe zugrunde, einen Wickelkörper anzugeben, der auch für den Einsatz bei Warmluftgeräten, beispielsweise als Lockenbürste geeignet ist. Der Wickelkörper soll großserienmäßig konstruktiv einfach, insbesondere aus Kunststoff bestehenden Spritzgußteilen herstellbar sein, eine ausreichende Stabilität auch bei größeren axialen Abmessungen und eine für jeden Durchmesser geschlossene, einem kreisförmigen Zylindermantel angenäherte Form aufweisen. Diese Aufgabe wird durch einen Wickelkörper mit den eingangs genannten Merkmalen gelöst, bei dem jeder Steg eine Aussparung über seine Längserstreckung aufweist, mit der die Abschnitte eines benachbart angeordneten Steges in einer jeden Positionierung der Stege formschlüssig in Verbindung stehen. Durch diese Maßnahme wird in vorteilhafter Weise eine geschlossene Form des Wickelkörpers für jeden Durchmesser gewährleistet, ebenso ist eine ausreichende Stabilität durch die formschlüssige Verbindung benachbarter Stege gegeben. Schließlich bietet die formschlüssige Verbindung der Stege des Wickelkörpers die Voraussetzung dafür, daß der Wickelkörper durch eine entsprechende Profilierung und Formgebung der Stege für jeden Durchmesser einen wenigstens annäherungsweise kreiszylinderförmigen Außenmantel aufweist.

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Dadurch, daß die Stege beidends des Trägerelementes in Drehlager aufgenommen sind, wird für einen einfachen, konstruktiven Aufbau des Wickelkörpers gesorgt. Der Raum zwischen den Lagerstellen ist frei und stellt somit keine Erhöhung des Strömungswiderstandes des Wickelkörpers dar. Dadurch, daß ein Drehlager als Lager mit offenen Lagerpfannen ausgebildet ist, wobei wenigstens ein Zapfen der Stege an einem kreissegmentförmigen Abschnitt des Trägerelementes sowie an einer Ringwand des Stellmittels gelagert ist, wird in äußerst vorteilhafter Weise die Möglichkeit geschaffen, den Wickelkörper lediglich mittels Schnappverbindungen zusammenzuhalten. Die Maßnahme, eine Drehachse der einzelnen Stege im Bereich eines Endabschnittes eines jeweiligen Steges anzuordnen, weist den Vorteil auf, daß die Stege sich zusätzlich am Trägerelement abstützen können. Äußerst vorteilhaft ist die Ausgestaltung, daß die Drehachse radial versetzt außerhalb des Profils des Steges angeordnet ist. Hierdurch wird die Voraussetzung geschaffen, daß im Falle einer Beborstung der Stege die Borsten für jeden Durchmesser des Wickelkörpers weitestgehend radial vom Wickelkörper abstehen. Dadurch, daß jeder Steg im Bereich eines mittleren Abschnittes randseitig einen Zapfen aufweist, der in jeweils eine Leitkurve des Stellmittels eingreift, das seinerseits drehbar am Trägerelement festgelegt ist, wird für eine äußerst einfache Verstellbarkeit der Stege zur Einstellung verschiedener Durchmesser des Wickelkörpers gesorgt. Eine besonders vorteilhafte Ausgestaltung des bekannten Wickelkörpers, die bereits für sich alleine geeignet ist, die Stabilitätsprobleme bekannter Wickelkörper zu lösen, besteht darin, daß jeder Steg bezüglich der Längsachse des Trägerelementes um ein Maß A axial verschiebbar gelagert ist. Hierdurch wird ermöglicht, jeden Steg mittels zusätzlicher Maßnahmen bezüglich radial von außen auf den Wickelkörper wirkender Kräfte abzustützen. Zur Einstellung eines anderen Durchmessers des Wickelkörpers werden die einzelnen Stege durch eine axiale Verschiebung aus einer in radialer Richtung

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wirkenden formschlüssigen Verbindung gelöst, um in eine Stellung eines anderen Durchmessers geschwenkt zu werden. Nach Beendigung des Schwenkvorganges werden die Stege in die axiale Ausgangslage zurückversetzt und wieder formschlüssig durch Mittel zur radialen Abstützung gehalten. Eine besonders vorteilhafte Ausbildung dieser Mittel zur radialen Abstützung der Stege besteht darin, die Stege über Rastmittel an dem Stellmittel axial festzulegen. Dabei wird gemäß einer vorteilhaften Weiterbildung eine Drehung der Stege mittels axialer Verschiebung und anschließender Verdrehung des Stellmittels durchgeführt. Dadurch, daß das Stellmittel einenends am Trägerelement und Stützmittel zur radialen Festlegung der Stege anderenends am Trägerelement vorgesehen sind, sind die Stege beidendig in radialer Richtung für jeden Durchmesser des Wickelkörpers formschlüssig festgelegt, wodurch die Stabilität des Wickelkörpers in äußerst vorteilhafter Weise erhöht wird. Eine besonders vorteilhafte Ausgestaltung der Stützmittel besteht darin, an einem jeden Steg eine in radialer Richtung angeordnete Zahnung vorzusehen, die in einen Rand eines Rohrbereichs eingreift. In äußerst vorteilhafter Weise besteht jeder Steg aus drei im wesentlichen bogenförmig zueinander angeordneten Längsleisten, die durch Querstege miteinander verbunden sind. Hierdurch wird zum einen die Möglichkeit einer bestimmten Profilgebung der Stege geschaffen, die es erlaubt, daß der Wickelkörper für jeden Durchmesser einen im wesentlichen kreiszylindrischen Außenmantel aufweist. Zum anderen besteht die Möglichkeit des Luftaustrittes zwischen den Querstegen, so daß der Wickelkörper auch als Warmluftbürste als Aufsatzgerät für einen Warmlufterzeuger Anwendung finden kann. Diese Anwendung wird vorteilhaft dadurch unterstützt, daß das Trägerelement einen rohrförmigen Abschnitt mit umfangsseitigen Öffnungen aufweist, die mit zwischen den Querstegen gebildeten Öffnungen zum Zwecke des Luftauslasses zusammenwirken. Dadurch, daß die Querstege mit borstenförmigen Fortsätzen versehen sind, besteht die Möglichkeit, den Wickelkör-

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per auch als Bürste zu verwenden. Dadurch, daß eine Außenseite einer Längsleiste eines Steges eine bogenförmige Aussparung in der Art aufweist, daß in jeder radialen Positionierung der Stege eine Kante, insbesondere eine Vorderkante der Längsleiste eines unmittelbar benachbarten Steges Formschluß zu der Aussparung aufweist, ergeben sich zwei Vorteile. Zum einen stützt sich jeder Steg über die gesamte Längserstreckung auf einem benachbarten Steg ab, was zu einer unerwartet hohen Stabilität des gesamten Wickelkörpers führt. Zum anderen wird durch diese Maßnahme verhindert, daß gegebenenfalls durch den Wickelkörper strömende Warmluft in größerem Maße durch bei größeren Durchmessern des Wickelkörpers zwischen den Stegen sonst entstehende Spalten ausströmt. Die durch den Wickelkörper strömende Warmluft kann für jeden Durchmesser des Wickelkörpers lediglich durch die Öffnungen, die gegebenenfalls zwischen den Querstegen vorgesehen sind, austreten. Durch diese Maßnahme wird bereits weitestgehend gewährleistet, daß der Strömungswiderstand eines als Warmluftbürste ausgebildeten Wickelkörpers für jeden Durchmesser in etwa konstant bleibt. Mit Vorteil weist die Unterseite der einen Längsleiste eine Anpassung an das Profil der Oberseite der weiteren Längsleiste auf. Hierdurch ist gewährleistet, daß sich benachbarte Stege im Falle der Einstellung von kleinen bzw. des kleinsten Durchmessers des Wickelkörpers bündig aneinanderlegen können. Vorteilhaft bezüglich der Stabilität ist es, daß sich eine Längskante der weiteren Längsleiste auf dem Außenmantel des rohrförmigen Abschnittes in jeder Positionierung der Stege abstützt. Dadurch, daß am Trägerelement wenigstens sechs Stege gelagert sind, die blütenkelchartig aufeinanderliegen, wobei in der Position des kleinsten Durchmessers die Längsleisten jeweils benachbarter Stege sowie die Öffnungen im rohrförmigen Abschnitt und im Bereich der Querstege benachbarter Stege übereinanderliegend zur Deckung kommen, wird eine besonders günstige Ausführung des Wickelkörpers hinsichtlich des Einsatzes als Warmluftbürste angegeben. Ist der

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kleinstmögliche Durchmesser des Wickelkörpers eingestellt, kann die in den rohrförmigen Abschnitt einströmende Luft durch die dort vorgesehenen Öffnungen und durch die übereinanderliegenden Stege, deren Öffnungen mit den Öffnungen im rohrförmigen Abschnitt zur Deckung kommen, ungehindert austreten. Der Strömungswiderstand ist für den kleinsten Durchmesser des Wickelkörpers minimal. Mit größer werdendem Durchmesser des Wickelkörpers schieben sich die Längsleisten mehr und mehr vor die Öffnungen im rohrförmigen Abschnitt, so daß sich der Strömungswiderstand für die aus dem Wickelkörper austretende Warmluft um ein gewisses Maß erhöht. Durch diese Maßnahme wird in äußerst vorteilhafter Weise gewährleistet, daß der Luftdurchsatz durch den Wickelkörper im wesentlichen unbeeinflußt vom jeweils eingestellten Durchmesser des Wickelkörpers ist. Die Trockenleistung eines mit einem derartigen Wickelkörper ausgestatteten Warmluftgerätes zur Haarpflege ist damit weitestgehend unabhängig vom jeweils eingestellten Durchmesser des Wickelkörpers und kann, soweit vorhanden, präzise mit den am Gerät vorgesehenen Schaltmitteln zur Variation der Drehzahl eines Lüftermotors sowie zur Variation der Leistung einer elektrischen oder gasbetriebenen Heizung eingestellt werden. Vorteilhaft hinsichtlich der einfachen Verstellbarkeit des Durchmessers des Wickelkörpers ist es, daß das Stellmittel zweidimensionale Leitkurven aufweist, die in einer zur Mittellängsachse senkrechten Ebene spiralig verlaufen.

Äußerst vorteilhaft erweist sich die Maßnahme, bei einem Wickelkörper mit den bekannten Merkmalen die Stege beidends des Trägerelementes in Schubführungen aufzunehmen. Hierdurch wird ein konstruktiv besonders einfach aufgebauter, in sich äußerst stabiler Wickelkörper angegeben. Insbesondere vereinfachen sich die Ausgestaltung des Trägerelementes sowie die zu dessen Herstellung erforderlichen Spritzgußwerkzeuge. Von Vorteil sind dabei die Schubführungen als Kammern ausgebildet, in denen Abschnitte der

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Stege formschlüssig geführt sind. Ganz besonders vorteilhaft geeignet, das Problem der Stabilisierung der Stege über ihre gesamte Länge zu lösen, ist die Tatsache, daß die Führung der Stege spitzwinklig, insbesondere in einem Winkel zwischen 10° und 80°, bevorzugt in einem Winkel von etwa 45° bezogen auf die Längsmittelachse erfolgt. Somit werden die Stege bei Einstellung eines geänderten Durchmessers des Wickelkörpers nicht nur in radialer Richtung bezüglich der Mittellängsachse des Trägerelementes, sondern auch in axialer Richtung bewegt. Die Stege werden zumindest abschnittsweise auf einer schiefen Ebene geführt, die hinsichtlich radial wirkender äußerer Belastungen beim Einsatz des Wickelkörpers als Widerlager dient. Hierzu sind beidends des Trägerelements Schrägflächen bzw. Böden angeformt, an denen sich Führungsflächen der Stege mit korrespondierenden Schrägen abstützen. Die einzelnen Stege können äußerst vorteilhaft zusätzlich dadurch abgestützt werden, daß am rohrförmigen Abschnitt des Trägerelements weitere Schrägflächen angeformt sind, die mit entsprechend geformten Führungsflächen der Stege korrespondieren. Je nach Bedarf und Einsatzzweck können am rohrförmigen Abschnitt eine oder mehrere solcher Schrägflächen angeformt sein, die zur zusätzlichen Abstützung der Stege in jeder Positionierung der Stege des Wickelkörpers dienen. Durch diese Maßnahme wird ein besonders stabiler Wickelkörper geschaffen, wobei dennoch der Innenraum des Wickelkörpers frei von weiteren Bauteilen ist, so daß ungehindert beispielsweise Luft bzw. Warmluft in den Wickelkörper einströmen kann. Dadurch, daß das Stellmittel dreidimensionale Leitkurven aufweist, die in einer zur Mittellängsachse senkrechten Ebene spiralig und in Bezug auf die Längsmittelachse axialer Richtung schraubenförmig ansteigend verlaufen, wird eine besonders vorteilhafte Ausgestaltung der Leitkurven des Stellmittels angegeben. Da die Steigung der Schraubenlinie und die Steigung der Spirale auf die schrägflächige Führung der Stege abgestimmt ist, lassen sich die einzelnen Stege äußerst sicher,

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praktisch ohne wesentlichen Kraftaufwand, in die gewünschte Position bringen. Dadurch, daß das Stellmittel leitkurvenseitig eine kegelstumpfförmige Ausnehmung aufweist, die sich flächig auf Stegen korrespondierender Steigung am Trägerelement drehbar abstützt, wird eine besonders vorteilhafte Lagerung des Stellmittels am Trägerelement angegeben. Als äußerst vorteilhaft und bereits an sich für die bekannten Wickelkörper geeignet, erweist sich die Anformung von Zapfen einenends der Stege, wobei die Zapfen jeweils in eine Leitkurve des Stellmittels eingreifen, so daß die Stege infolge der Betätigung des Stellmittels sowohl in radialer als auch in axialer Richtung bezüglich der Längsmittelachse formschlüssig geführt sind. Aufgrund der Beweglichkeit der Stege in axialer Richtung können diese auf schiefen Ebenen oder ähnlichen Mitteln für jeden Durchmesser des Wickelkörpers hinsichtlich radialer, äußerer Beanspruchung unterstützt bzw. gesichert werden. Weiterhin ist es vorteilhaft, daß anderenends der Stege eine winklige Nase im Bereich der Führungsfläche angeformt ist, die von einem Abschnitt übergriffen ist, so daß die Stege in einem Kanal formschlüssig geführt sind. Zum einen wird hierdurch eine einfache Montierbarkeit der Stege am Trägerelement gewährleistet, zum anderen sind die Stege damit auch auf der dem Stellmittel abgewandten Seite formschlüssig geführt. Dadurch, daß jeder Steg aus zwei Längsleisten besteht, die durch Querstege miteinander verbunden sind, ist mit Vorteil gewährleistet, daß die Stege für jeden Durchmesser des Wickelkörpers einen geschlossenen Mantel von in etwa kreiszylinderförmiger Gestalt bilden. Durch diese zwischen den Querstegen vorgesehenen Öffnungen kann in den Wickelkörper eintretende Warmluft aus diesem auch wieder austreten. Hierzu ist das Trägerelement bzw. ein rohrförmiger Abschnitt desselben mit Vorteil mit umfangsseitigen Öffnungen versehen, die mit zwischen den Querstegen gebildeten Öffnungen zusammenwirken. Dadurch, daß die Querstege borstenförmige Fortsätze aufweisen, ist eine Verwendung des Wickelkörpers als Bürste

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bzw. Warmluftbürste mit variablem Durchmesser gewährleistet. Ganz besonders vorteilhaft erweist sich die Maßnahme, eine Längsleiste des Steges mit einer nutförmigen Aussparung zu versehen, in die wenigstens Abschnitte einer weiteren Längsleiste eines benachbarten Steges formschlüssig in jeder radialen Positionierung der Stege eingreifen. Einerseits wird hierdurch die Stabilität des gesamten Wickelkörpers erhöht, da sich jeder Steg auf bzw. in oder an einem benachbarten Steg abstützt, andererseits wird hierdurch vermieden, daß in den Wickelkörper eingebrachte Luft bzw. Warmluft zwischen den einzelnen Stegen durch etwaige Spalten austreten kann. Somit kann die Warmluft nur durch die zwischen den Querstegen der einzelnen Stege vorgesehenen Öffnungen ausströmen, so daß der Luftdurchsatz durch den mit Warmluft beaufschlagten Wickelkörper unabhängig vom jeweils eingestellten Durchmesser im wesentlichen konstant bleibt. Dadurch, daß ein Randbereich der Längsleisten kammartige Durchbrüche aufweist, die mit den Öffnungen zwischen den Querstegen benachbarter Längsleisten korrespondieren, wird selbst beim kleinsten eingestellten Durchmesser des Wickelkörpers, bei dem die Längsleisten eines Steges in den Bereich der Querstege eines benachbarten Steges hineinragen, der Strömungswiderstand nicht erhöht und somit der Luftdurchsatz nicht verändert. Eine besonders vorteilhaft Ausführung, die sich durch ihre einfache Konstruktion auszeichnet, besteht darin, daß die Längsleiste wenigstens in einem axialen Abschnitt in eine nutförmige Aussparung, deren Boden eine schiefe Ebene bildet, aufweist und sich formschlüssig auf einem eine korrespondierende schiefe Ebene bzw. Schrägfläche bildenden Steg am Trägerelement abstützt. Somit können die einzelnen Stege auch außerhalb der Endabschnitte vorteilhaft am Trägerelement geführt und gestützt werden. Dadurch, daß das Stellmittel mittels einer Kappe und darin angeformter Federarme am Tragkörper durch Klipsen gesichert ist, ergibt sich ein besonders einfacher Zusammenbau des Wickelkörpers. Von Vorteil ist es auch, in einer zentralen Aussparung

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der Kappe einen Knopf anzuordnen, der die Spreizung eines Federelementes bewirkt, welches in einer Ringnut eines pilzförmigen Bereiches des Tragkörpers eingreift. Durch diese Maßnahme wird eine einfache, lösbare Kupplung zwischen Wickelkörper und Tragkörper angegeben. Der Wickelkörper kann somit ohne weiteres beispielsweise zum Zwecke der Reinigung oder zum Austausch mit einem anderen Wickelkörper vom Tragkörper durch einfaches Drücken des Knopfes abgenommen werden. Vorteilhaft findet dieser Wickelkörper mit variabel einstellbarem Durchmesser Anwendung als Lockenwickler, Aufsatzbürste eines Warmlufthaarpflegegerätes oder Haarbehandlungsabschnitt eines elektrisch bzw. gasbetriebenen Lockenstabes Anwendung.

Weitere Vorteile der Erfindung ergeben sich aus der nachfolgenden Beschreibung der Ausführungsbeispiele und den Figuren. Es zeigen:

Fig. 1 ein herkömmliches, bekanntes Warmlufthaarpflegegerät, Typ AS 13, Hersteller Braun AG,

Fig. 2 einen Längsschnitt durch den Kopf des Wickelkörpers eines ersten Ausführungsbeispieles,

Fig. 3 eine Fortsetzung des Schnittes nach Fig. 2 durch den Fuß des Wickelkörpers,

Fig. 4 einen Längsschnitt entsprechend Fig. 2, jedoch um ca. 90° verdreht,

Fig. 5 einen Querschnitt durch den Kopf des Wickelkörpers gemäß V-V der Fig. 4, wobei das Stellmittel zum Teil weggebrochen dargestellt ist,

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Fig. 6 einen Längsschnitt durch den Fuß des Wickelkörpers, gegenüber dem Schnitt der Fig. 3 um 30° gedreht,

Fig. 7 einen Querschnitt durch den Wickelkörper des ersten Ausführungsbeispiels mit dem kleinsten einstellbaren Durchmesser,

Fig. 8 einen Querschnitt durch den Wickelkörper gemäß Fig. 7 mit dem größtem einstellbaren Durchmesser,

Fig. 9 einen Längsschnitt durch den Kopf des Wickelkörpers nach einem zweiten Ausführungsbeispiel,

Fig. 10 eine Fortsetzung des Schnitts gemäß Fig. 9 durch den Fuß des Wickelkörpers,

Fig. 11 einen Querschnitt gemäß XI-XI der Fig. 10,

Fig. 12 einen Querschnitt durch den Wickelkörper des zweiten Ausführungsbeispiels gemäß XII-XII der Fig. 10, wobei je zwei Stege in der Stellung des kleinsten und größten Durchmessers dargestellt sind,

Fig. 13 eine Draufsicht auf das Kopfende des Trägerelements bei entferntem Stellmittel,

Fig. 14 einen Querschnitt durch einen einzelnen Steg gemäß dem Schnit XIV-XIV der Fig. 10

Fig. 15 eine Draufsicht auf das Stellmittel mit dreidimensionalen Leitkurven.

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In Fig. 1 ist ein bekanntes warmluftbetriebenes Haarpflegegerät dargestellt, für welches der im weiteren beschriebene Wickelkörper als Aufsatz vorteilhaft zur Anwendung kommt. Allerdings ist die Anwendung nicht auf warmluftbetriebene Haarpflegegeräte beschränkt, sondern erstreckt sich auf jegliche Wickelkörper zur Haarpflege. Das Warmluftgerät weist zwei Gehäuseteile 62 auf, die im Inneren einen Motor 66 und eine Heizung 64 zur Erzeugung von Warmluft aufnehmen. Über ein Netzkabel 68 sind die elektrisch betriebenen Einheiten an die Stromversorgung anschließbar. Die Verbindung des Netzkabels 68 mit dem Gehäuse ist über Kontakte 74 drehbar ausgeführt. Ein Spannungswähler 78 erlaubt den Einsatz des Gerätes an Stromversorgungsnetzen mit unterschiedlicher Spannung. Mittels eines Schalterschiebers 84 ist ein im Gehäuse vorgesehener Schalter 82 betätigbar, so daß das Gerät in verschiedenen Betriebszuständen gehandhabt werden kann. Die Gehäuseteile 62 umfassen einen zylindrischen Ansatz eines Dornes 10, der kopfseitig aus dem Gehäuse herausragt. Am Fuß des Dornes ist ein Kupplungsring 72, der unter der Spannung einer Druckfeder 76 steht, angeordnet. Der Dorn 10 dient zur drehbaren Lagerung einer Bürste 85, die mittels eines Knopfes 50 am Dorn 10 axial gesichert ist. Im eingeschalteten Zustand treibt der Motor 66 ein nicht dargestelltes Lüfterrad an, so daß ein Luftstrom entsteht, der durch die Heizung 64 erwärmt werden kann. Am Fußpunkt des Dornes 10 tritt dieser Luftstrom durch dort vorgesehene Öffnungen aus und durchströmt die Bürste 85. Durch in der Bürste 85 umfangsseitig vorgesehene Öffnungen tritt dieser Luftstrom aus und kommt in Kontakt mit dem auf die Bürste 85 aufgerollten bzw. aufgewickelten Haar, um dieses zu formen und zu trocknen. Mittels des Kupplungsringes 72 ist die Bürste 85 entriegelbar und läßt sich zur leichteren Handhabung auf dem Dorn 10 frei drehen. Zum Zwecke des Abnehmens der Bürste 85 kann der Knopf 50 durch Drehung entfernt werden. Somit läßt sich die Bürste 85 gegebenenfalls reinigen bzw. gegen eine weitere Bürste 85 anderen Durchmessers zur Formung kleinerer oder größerer Locken austauschen.

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In den Figuren 2 bis 8 ist ein erstes Ausführungsbeispiel eines Wickelkörpers mit variablem Durchmesser in verschiedenen Ansichten dargestellt. Der Wickelkörper ist aufgesetzt auf den Dorn 10 des Warmluftpflegegerätes und an einem pilzförmigen Bereich 52 des Dornes 10 mittels einer Spreizfeder 53 festgelegt. Diese Spreizfeder 53 kann durch am Knopf 50 angeformte Schrägen 40 geöffnet werden, so daß der Wickelkörper vom Dorn 10 abnehmbar ist. Der Knopf 50 ist in einer Kappe 30 axial verschiebbar gelagert. Die Schrägen 40 des Knopfes 50 laufen in zwei Führungsstege 60 aus, die in Nuten 70 (Fig. 5) eines Trägerelementes 80 geführt werden. Durch diesen Aufbau der Verriegelung wird die Bürste 85 axial gesichert und kann sich auf dem Dorn 10 frei drehen, falls sie nicht durch einen Kupplungsring 72 (Fig. 1) radial festgelegt ist. Der Wickelkörper besteht aus dem Trägerelement 80, an welches kopfseitig ein Flansch 17 angeformt ist. Der Flansch 17 dient der drehbaren Lagerung der Stege 13, die gegebenenfalls mit angeformten Borsten 16 versehen sind. Wie insbesondere aus Fig. 5 ersichtlich, wird die Lagerung der Stege 13 durch angeformte Zapfen 18, 19 gebildet, die mit kreissegmentförmigen Bereichen 21 am Flansch 17 zusammenwirken. Vervollständigt wird diese Lagerung durch an den Zapfen 18 angeformte Nasen 26, die mit einer an einer topfförmigen Innenwand des als Stellring ausgebildeten Stellmittels 23 umlaufenden Nut 27 zusammenwirken. Oberhalb des Flansches 17 ist ein Vielkeilprofil 22 (Fig. 2, 3) angebracht, das mit einem korrespondierenden Profil am Stellmittel 23 zusammenwirkt. Das Stellmittel 23 weist an seiner den Stegen 13 zugewandten Seite entsprechend deren Anzahl Leitkurven 24 auf, in denen die Stege 13 über endseitig angeformte Zapfen 25 (Fig. 4) bzw. Lenkarme geführt werden. Die Zapfen 18, 19 der Stege 13 sind um das Maß A gegenüber den kreissegmentförmigen Bereichen 21 des Flansches 17 erhöht. Durch das Zusammenwirken der Nase 26 und der Nut 27 sind die Stege 13 in axialer Richtung formschlüssig mit dem Stellmittel 23 verbunden und können zusammen mit diesem um

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das Maß A in axialer Richtung verschoben werden. Wird das Stellmittel 23 gegen die Wirkung einer Feder 28 verschoben, so entkuppelt sich das Profil 22. Das Stellmittel 23 kann nun verdreht werden, soweit dies die Leitkurven 24 gegenüber den Zapfen zulassen.

In einem rohrförmigen Abschnitt 14 des Trägerelementes 80 sind umfangsseitig eine Vielzahl von Öffnungen 15 vorgesehen, aus denen gegebenenfalls Warmluft austreten kann. Der Wickelkörper ist insgesamt konzentrisch zu einer Mittellängsachse 112 des Dorns 10 angeordnet. Gemäß Fig. 3 ist der Wickelkörper an dem dem Gehäuseteil 62 zugewandten Ende von einem rohrförmigen Bereich 49 umfaßt. An dem dem Wickelkörper abgewandten Ende des rohrförmigen Bereiches 49 weist dieser eine Stirnverzahnung 42 auf, die mit einer entsprechenden Verzahnung am Gehäuse zusammenwirkt und zur Verdrehsicherung des Wickelkörpers (entsprechend Kupplungsring 72) dient. Der rohrförmige Bereich 49 dient gegebenenfalls der Luftführung des Warmluftstroms in den Wickelkörper und der Lagerung der Stege 13 an dem den offenen Lagerpfannen (Zapfen 18, 19, Bereich 21) abgewandten Ende. Hierzu stehen einstückig angeformte, torpedoförmige Lager 12 für die Stege 13 über Stege 11 mit dem rohrförmigen Bereich 49 in Verbindung. Die Zapfenlager 12 gehen zur Mittellängsachse 112 einstückig in den rohrförmigen Abschnitt 14 über, der bis in den Kopfbereich des Wickelkörpers reicht. Die torpedoförmigen Lager 12 nehmen Zapfen 46 der Stege 13 auf, wobei die Zapfen 46 an kleinen Lenkarmen der Stege 13 einstückig angeformt sind. Zur Variation des Durchmessers des Wickelkörpers wird das Stellmittel 23 gegen die Wirkung der Feder 28 verschoben, so daß sich das Profil 22 entkuppelt. Der Stellring 23 kann verdreht werden, soweit dies die Leitkurven 24 gegenüber den Zapfen 25 zulassen. Die Teilung des Profils 22 ist dabei so gewählt, daß innerhalb des genannten Drehbereiches mehrere Wiedereintrittsmöglichkeiten für das Profil 22 vorhanden

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sind. Auf diese Weise können die gewünschten unterschiedlichen Wickelkörperdurchmesser festgelegt werden. Die Axialverschiebbarkeit der Stege 13 und des Stellmittels 23 erlaubt, daß die Stege 13 auf der dem Stellmittel 23 abgewandten Seite ebenfalls gegen radiale Beanspruchung abgestützt werden können. Dies wird mit Hilfe einer Zahnung 29 (Fig. 3, 6), die einstückig seitlich der ersten geräteseitigen Borste 16 oder am Steg 13 angeformt ist, bewerkstelligt. Diese Zahnung 29 ist abgestimmt auf die Teilung des Profils 22 und greift bei den jeweils einstellbaren Wickelkörperdurchmessern in einen oberen Rand 48 des Rohrbereichs 49 ein. Durch diese Maßnahme werden die Stege 13 in jeder Einstellung des Durchmessers des Wickelkörpers beidends des Wickelkörpers gegen radiale, äußere Belastungen abgestützt und erreichen eine gute Stabilität. In der Darstellung der Fig. 4, die eine um ca. 90° gedrehte Schnittebene im Bezug zu Fig. 2 wiedergibt, sind gleiche Teile mit gleichen Bezugsziffern gekennzeichnet. Insbesondere ist aus dieser Figur ersichtlich, daß sich die Feder 28 im Innenboden der Kappe 30 abstützt, wobei die Kappe 30 mit Hilfe angeformter Federarme 31 in entsprechenden Öffnungen des Trägerelementes 80 einrastet.

Die Lagerung der Stege 13 im kopfseitigen Bereich des Wickelkörpers wird durch die Darstellung der Fig. 5, in deren rechten Teil das Stellmittel 23 nicht dargestellt ist, weiter verdeutlicht. Das offene, insbesondere für eine Steckmontage der Stege 13 geeignete Pfannenlager wird durch die an den Leisten angeformten Zapfen 18 und 19 sowie den kreissegmentförmigen Bereich 21 am Flansch 17 gebildet. Eine zusätzliche Führung erhalten die Zapfen 18 und 19 dadurch, daß sie an der ringförmigen Innenwand einer topfförmigen Ausnehmung im Stellmittel 23 bzw. in einer dort vorhandenen Nut 27 anliegen. Die Zapfen 25 werden in den Leitkurven 24 (linke Seite der Figur 5) geführt, so daß eine Drehung des Stellmittels 23 zu einer Drehbewegung der Stege 13 um eine auch

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aus Fig. 7 und 8 ersichtliche Drehachse 20 führt. In Fig. 6 wird in einem Längsschnitt durch den Fuß der Bürste das Zusammenwirken der Zahnung 29 mit dem Rand 48 des Rohrbereiches 49 erläutert. Bei Einstellung eines geänderten Durchmessers des Wickelkörpers werden die Stege 13 um ein Maß A, das in etwa der Zahntiefe der Zahnung 29 entspricht, in Richtung des Kopfendes des Wickelkörpers verschoben. Die Zahnung 29 greift dann nicht mehr in den Rand 48 ein, so daß die Stege 13 aufgrund der Drehbewegung des Stellmittels 23 frei um die Drehachse 20 drehbar sind. Nach Beendigung der Drehbewegung werden die Stege 13 aufgrund der Wirkung der Feder 28 axial zurückgeschoben, wobei eine andere Zahnung 29 in den Rand 48 eingreift. Die Zahnsteigung der Zahnung 29 ist dabei auf das Profil 22 am Trägerelement 80 bzw. am Stellmittel 23 abgestimmt. Somit wird am fußseitigen Ende des Wickelkörpers jeder Steg 13 formschlüssig festgelegt und ist gegen Verbindungen aufgrund radialer Beanspruchungen gesichert.

Aus den Figuren 7, 8 ist das Querschnittsprofil der einzelnen Stege 13 und die Anordnung dieser Stege 13 bezüglich des Trägerelementes 80 näher ersichtlich. Die Stege 13 bestehen aus einer ersten Längsleiste 32, die über zahlreiche Querstege 33 mit einer zweiten Längsleiste 34 verbunden ist. Zwischen den Querstegen 33 sind Luftaustrittsöffnungen vorgesehen, die mit den am rohrförmigen Abschnitt 14 des Trägerelements 80 vorgesehenen Öffnungen 15 korrespondieren. Die Unterseite 35 der zweiten Längsleiste 34 weist eine derartige Formgebung auf, daß diese Unterseite 35 beim kleinsten einstellbaren Durchmesser des Wickelkörpers formschlüssig auf der Oberseite der ersten Längsleiste 32 anliegt. Die Außenseite 36 ist kurvenförmig ausgebildet, so daß eine insbesondere konvexe Aussparung 39 über die gesamte Erstreckung der zweiten Längsleiste vorliegt. An diese zweite Längsleiste 34 schließen sich weitere Querstege 51 an, die teilweise oder insgesamt mit Borsten 16 versehen sein können. Diese Querstege 51

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stellen die Verbindung mit der zweiten Längsleiste 34 mit einer dritten Längsleiste 37 her, wobei zwischen den Querstegen 51 bevorzugt wiederum Öffnungen vorgesehen sind, die mit den Öffnungen zwischen den Querstegen 33 sowie den Öffnungen 15 korrespondieren. Die Längsleisten 32, 34 und 37 sind stumpfwinklig zueinander angeordnet, so daß jeder einzelne Steg 13, bestehend aus den Längsleisten 32, 34 und 37 sowie den dazwischen vorgesehenen Querstegen 33 und 51 in etwa eine kreisbogenförmige Gestalt annimmt. Die Formgebung der Aussparung 39 ist insbesondere äußerst vorteilhaft derart gestaltet, daß eine Vorderkante 38 der Längsleiste 37 für jeden Durchmesser des Wickelkörpers formschlüssig an der Außenseite 36 der Aussparung 39 anliegt. Dadurch, daß die Drehachse 20 der Stege 13 etwas radial nach außen versetzt außerhalb der Längsleiste 32 angeordnet ist, wird zum einen erreicht, daß sich die Stege 13 in jeder Drehstellung mit der Längskante 41 der Längsleiste 32 ständig auf dem rohrförmigen Abschnitt 14 abstützen. Zum anderen bietet diese Maßnahme der Positionierung der Drehachse 20 außerhalb des Profils der Stege 13 die Gewähr dafür, daß die Borsten 16 in jeder Drehstellung der Stege wenigstens annähernd radial bezüglich der Mittellängsachse 112 ausgerichtet sind. Zusammenfassend kann die Profilierung der Stege 13 dahingehend charakterisiert werden, daß jeder Steg 13 derart geformt ist, daß unabhängig von der jeweiligen Drehstellung der Stege 13 einerseits Formschluß zwischen der Längsleiste 32 und dem rohrförmigen Abschnitt 14 und andererseits Formschluß zwischen einer Vorderkante 38 der Längsleiste 37 sowie der Außenseite 36 der Ausnehmung 39 eines benachbarten Steges 13 besteht. Hierdurch wird ein sehr stabiler Wickelkörper angegeben, der gegen radiale Belastungen äußerst widerstandsfähig ist. Ein weiteres Kriterium zur Gestaltung der Aussparungen 39 besteht darin, daß diese im Falle des kleinsten eingestellten Durchmessers des Wickelkörpers die Längsleiste 37 eines benachbarten Steges 13 praktisch vollständig aufnimmt, und zwar derart, daß der Außenmantel des

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Wickelkörpers, einmal abgesehen von den Borsten 16, praktisch kreisförmige Gestalt annimmt. Die Öffnungen zwischen den Querstegen 33 und 51 kommen mit den Öffnungen 15 im rohrförmigen Abschnitt 14 des Trägerelements 80 im Falle des kleinsten eingestellten Durchmessers des Wickelkörpers praktisch zur Deckung, so daß in dieser Einstellung der geringste Strömungswiderstand für aus dem Inneren des rohrförmigen Abschnitts 14 durch die Öffnungen ausströmende Warmluft besteht. Wird der Durchmesser des Wickelkörpers durch Drehung des Stellmittels 23 vergrößert, so schiebt sich die Längsleiste 32 teilweise zwischen die Öffnungen 15 des rohrförmigen Abschnitts 14 und die Öffnung zwischen den Querstegen 51. Wie praktische Versuche gezeigt haben, wird durch diese Maßnahme auf überraschende Weise dafür gesorgt, daß der Luftdurchsatz durch die Öffnungen des Wickelkörpers nahezu unabhängig von dem jeweils eingestellten Durchmesser des Wickelkörpers ist. Eine mutmaßliche Erklärung besteht darin, daß an und für sich eine Durchmesservergrößerung des Wickelkörpers zu einem geringeren Strömungswiderstand führt, dieser aber durch das teilweise Eintauchen der Längsleiste 32 in den Austrittsbereich der Warmluft wieder auf den ursprünglichen, beim kleinsten Durchmesser vorliegenden Wert erhöht wird. In ähnlicher Weise wirkt auch die Längsleiste 37, die sich bei Vergrößerung des Durchmessers teilweise vor die Öffnung zwischen den Querstegen 33 schiebt. Der Außenmantel des Wickelkörpers nimmt auch für den größten einstellbaren Durchmesser annähernd kreisförmige Gestalt an, sofern man einmal von den Einbuchtungen im Bereich der Aussparungen 39 absieht. Bezüglich der Festlegung der Drehachse 20 sei noch angemerkt, daß diese für einen mittleren Durchmesser des Wickelkörpers derart fixiert ist, daß die Verbindungslinie zwischen der Drehachse 20 und der Mittellängsachse 112 einen in etwa rechten Winkel zur Borstenachse 122 bildet. In diesem Falle stehen die Borsten 16 weitestgehend radial von der Bürste 85, unabhängig von dem jeweiligen Durchmesser des Wickelkörpers, ab.

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Insgesamt wird durch diese Konstruktion des Wickelkörpers ein äußerst stabiles, belastungsfähiges Gebilde geschaffen, dessen Durchmesser variierbar ist. Weitestgehend unabhängig von der Einstellung des jeweiligen Durchmessers des Wickelkörpers ist die Länge der Borsten 16, ihre radiale Stellung bezüglich der Mittellängsachse 112 des Wickelkörpers. Im Fall des Einsatzes des Wickelkörpers als warmluftdurchströmte Bürste ist auch der Luftdurchsatz und damit die Temperatur im wesentlichen unabhängig vom jeweils eingestellten Durchmesser. Die einzelnen Stege 13, die einander in jeder Drehstellung übergreifen, sind parallel zur Mittellängsachse 112 gelagert und bilden für die unterschiedlichen Durchmesser im wesentlichen Mantelflächen kreisförmiger Gestalt, so daß die Abweichung von der idealen Kreisform minimiert ist. Der gesamte Wickelkörper ist konstruktiv derart gestaltet, daß er ausschließlich über Schnappverbindungen montierbar ist und die Einzelteile in Großserie spritzgußtechnisch herstellbar sind.

In den Figuren 9 bis 15 ist ein weiteres Ausführungsbeispiel des erfindungsgemäßen Wickelkörpers dargestellt, wobei mit dem ersten Ausführungsbeispiel vergleichbare Teile mit identischen Bezugsziffern versehen sind. Im folgenden werden detaillierter lediglich die Unterschiede zum ersten Ausführungsbeispiel erläutert. Abweichend von den zweidimensionalen Leitkurven 24 des Stellmittels 23 gemäß dem ersten Ausführungsbeispiel weist das Stellmittel 23 (Fig. 9, 15) vorliegend dreidimensionale Leitkurven 24 auf. Die Leitkurven 24 verlaufen einerseits spiralig in einer zur Mittellängsachse 112 senkrechten Ebene. Insbesondere nehmen die Leitkurven 24 die Form archimedischer Spiralen an. Darüber hinaus weisen die Leitkurven 24 bzw. deren Bodenflächen 56 in axialer Richtung (Mittellängsachse 112) einen schraubenförmigen Verlauf auf, wobei im vorliegenden Ausführungsbeispiel die Steigung der Leitkurven 24 in radialer und axialer Richtung gleich groß ge-

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wählt worden ist. Allerdings ist es ebensogut möglich, unterschiedliche Steigungen in radialer und axialer Richtung vorzusehen, wobei die Führungen der Stege 13 entsprechend anzupassen sind. Ein an die Stege 13 angeformter Zapfen 25 wird in der Leitkurve 24 auf einer Bahn geführt, die auf einem zur Mittellängsachse 112 konzentrischen Kegelmantel verläuft, dessen Mantellinie einen Winkel von insbesondere 45° mit der Mittellängsachse 112 bildet. Einen gleichen Winkel zur Mittellängsachse 112 weisen auch an den Stegen 13 angeformte Führungsflächen 95, 96 und 97 auf. Diese Führungsflächen 95, 96 und 97 an jedem Steg 13 wirken dabei zusammen mit entsprechenden Schrägflächen 98, 99 sowie einem Boden 94, die ihrerseits am Trägerelement 80 angeformt sind. Diese Schrägflächen 98, 99 bzw. der Boden 94 bilden gleichfalls einen Winkel von ca. 45° in Bezug auf die Mittellängsachse 112. Zur Verstellung des Durchmessers des Wickelkörpers wird das Stellmittel 23 gedreht, wobei dieses mittels einer Rastkugel 54 in unterschiedlichen Positionen rastbar ist. Aufgrund des Eingriffs der Zapfen 25 der Stege 13 in die Leitkurven 24 werden die Stege 13 angetrieben, und zwar auf einer Bahn die im vorliegenden Sonderfall einen Winkel von 45° mit der Mittellängsachse 112 einschließt. Gemäß dem vorliegenden Ausführungsbeispiel wird jeder Steg 13 in drei Bereichen, nämlich den beiden Endbereichen und im Mittelbereich gegen radial von außen auf den Wickelkörper einwirkende Kräfte abgestützt. Je nach Ausführung des Wickelkörpers und nach Einsatzzweck kann unter Umständen der mittlere Stützabschnitt entfallen oder durch weitere Stützabschnitte ergänzt werden.

Das Stellmittel 23 weist eine kegelstumpfförmige, zentrale Ausnehmung 114 auf, in deren Innenmantelfläche die Leitkurven 24 eingebracht sind. Die Mantelfläche der Ausnehmung 114 wirkt zusammen mit Stegen 110, die am Trägerelement 80 angeformt sind. Diese Stege 110 weisen eine der Steigung des Kegelmantels der

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Ausnehmung 114 entsprechende Steigung auf und dienen einerseits zur Abstützung und drehbaren Lagerung des Stellmittels 23, andererseits bilden die Stege 110 paarweise Kammern 92, in denen die Stege 13 bzw. Teile der angeformten Zapfen 25 in radialer Richtung, wie beispielsweise aus Fig. 13 ersichtlich ist, geführt sind. Wird der Durchmesser des Wickelkörpers größer gestellt, so werden die einzelnen Stege 13 in radialer und axialer Richtung angetrieben und bewegen sich auf einer Bahn, die einen Winkel von ca. 45° bezüglich der Mittellängsachse 112 bildet. Der Winkel von 45° kann natürlich auch in einem Bereich zwischen 10 und 80° entsprechend den individuellen Anforderungen variiert werden. Wird ein kleinerer Durchmesser des Wickelkörpers eingestellt, so bewirkt die von den Leitkurven 24 auf die Zapfen 25 radial nach innen zur Mittellängsachse 112 wirkende Kraft, daß die Stege 13 mit den entsprechenden Führungsflächen 95, 96 und 97 winklig nach innen gleiten und somit auch der Bodenfläche 56 der Leitkurven 24 folgen. Die Abstützung der Stege 13 im mittleren Abschnitt des Trägerelementes 80 bzw. dessen rohrförmigen Abschnittes 14 ist insbesondere aus Fig. 12 ersichtlich. Unterhalb von an jedem Steg 13 in diesem Abschnitt angebrachten, winklig zur Mittellängsachse 112 verlaufenden Führungsflächen 96 erstreckt sich eine am rohrförmigen Abschnitt 14 angeformte Schrägfläche 99, auf der der Steg 13 bei Änderung des Durchmessers des Wickelkörpers wie auf einer schiefen Ebene hinabgleitet bzw. hinaufgeschoben wird. Diese schiefe Ebene sorgt für jeden Durchmesser des Wickelkörpers für eine Abstützung der Stege 13 im Mittenbereich hinsichtlich von außen auf die Stege 13 wirkenden Kräften bei jedem eingestellten Durchmesser des Wickelkörpers. Am Fußpunkt des Wickelkörpers weist das Trägerelement 80, wie insbesondere aus Figur 10, 11 und 12 ersichtlich ist, sechs schlitzartige Kammern 90 auf, deren Boden 94 ebenfalls in dem bevorzugten Winkel von etwa 45° zur Mittellängsachse 112 verläuft. Jede Kammer 90 wird durch zwei am Trägerelement 80 angeformte Seitenwände 44 gebildet. Die

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Stege 13 weisen Endabschnitte auf, die mit Führungsflächen 97 versehen sind, welche in den Kammern 90 geführt werden. Um die Stege 13 in radialer Richtung zwangszuführen, weisen die Enden der Stege 13 im Bereich der Führungsfläche 97 winklig hervorstehende Nasen 86 (siehe Fig. 11) auf, die von einem Abschnitt 88 an dem rohrförmigen Bereich 49 vergriffen werden. Durch diese Maßnahme wird zwischen dem Boden 94 des Trägerelementes 80 und dem Abschnitt 88 des Rohrbereiches 49 ein Kanal 116 gebildet, in dem die Nase 86 der Stege 13 formschlüssig auf einer etwa 45° geneigten Bahn geführt ist. Wie aus Fig. 12 ersichtlich ist, sichern kleine winklige Zapfen 58 des Rohrbereiches 49 diesen am Trägerelement 80 dadurch, daß die Zapfen 58 mit Nuten 59 zusammenwirken. Durch diese Maßnahme ist eine äußerst einfache Montage der Stege 13 auf dem Trägerelement 80 gewährleistet.

Die einzelnen Stege 13 weisen die aus Fig. 12 bzw. Fig. 14 ersichtliche Profilierung auf. Eine erste Längsleiste 102 ist über Querstege 118, die gegebenenfalls mit Borsten 16 versehen sein können, mit einer zweiten Längsleiste 106 verbunden. Zwischen den Querstegen 118 sind Öffnungen im Steg 13 vorgesehen, die mit entsprechenden Öffnungen 15 im rohrförmigen Abschnitt 14 korrespondieren, so daß beispielsweise Warmluft aus dem Wickelkörper austreten kann. Die Längsleiste 106 weist eine annähernd pfeilförmige Form auf, wobei die Pfeilspitze mit den Querstegen 118 verbunden ist. Randseitig ist die Längsleiste 106 mit Schlitzen 108 versehen, so daß der Randbereich in etwa eine kammartige Gestalt annimmt. Die Längsleiste 106 wird in einer als Längsnut ausgebildeten Aussparung 104 der Längsleiste 102 eines unmittelbar benachbarten Steges 13 formschlüssig geführt. Wie insbesondere aus Fig. 12 ersichtlich ist, taucht die Längsleiste 106 beim kleinsten eingestellten Durchmesser des Wickelkörpers tief in die Längsnut 104 der Längsleiste 102 ein und ragt teilweise in die Öffnungen zwischen den Querstegen 118. Die Schlitze 108 sind nun

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derart an der Längsleiste 106 angeordnet, daß diese im wesentlichen mit den Öffnungen zwischen den Querstegen 118 korrespondieren und somit keine merkliche Erhöhung des Strömungswiderstandes für kleine Durchmesser des Wickelkörpers auftritt. Wird der Durchmesser des Wickelkörpers durch Drehung des Stellmittels 23 vergrößert, so gleitet die Längsleiste 106 aus der Ausnehmung 104 der Längsleiste 102 eines benachbarten Steges 13 größtenteils heraus. Unabhängig vom eingestellten Durchmesser besteht somit in jeder Positionierung der Stege 13 Formschluß zwischen benachbarten Stegen, so daß auch dieses Ausführungsbeispiel des erfindungsgemäßen Wickelkörpers eine hohe Stabilität gegen radiale Beanspruchungen aufweist. Zusätzlich werden die Stege 13 wenigstens beidendig auf schiefen Ebenen geführt, was durch die axiale Verschiebbarkeit der Stege in Verbindung mit der dreidimensionalen Leitkurve 24 des Stellmittels 23 ermöglicht wird. Zur Verbesserung der Stabilität können je nach Erfordernis ein oder mehrere schiefe Ebenen im Mittelbereich der Stege auf dem rohrförmigen Abschnitt 14 vorgesehen sein. Wie insbesondere aus Fig. 12 ersichtlich ist, weist auch dieser Wickelkörper eine für alle Wickeldurchmesser im wesentlichen kreisförmige Mantelfläche auf. Lediglich für größere Durchmesser des Wickelkörpers entstehen zwischen benachbarten Stegen 13 längsnutartige Vertiefungen mit einer Tiefe, die etwa einem Drittel der Dicke des Steges 102 entspricht. Neben der äußerst guten Stabilität zeichnet sich dieser Wickelkörper durch seine einfache Herstellbarkeit aus und ist auch zum Einsatz als Warmluftbürste gut geeignet. Die Borstenachsen 122 der gegebenenfalls vorgesehenen Borsten 16 weisen gemäß Fig. 12 zwar eine geringe Abweichung von der exakt radialen Ausrichtung auf, diese Abweichung von einigen Grad ist jedoch für den praktischen Gebrauch eines derartigen Wickelkörpers vernachlässigbar.

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Beide Ausführunsformen des erfindungsgemäßen Wickelkörpers weisen ihnen eigene Vorteile auf, wobei jedoch im Falle, daß der Stabilitätsgesichtspunkt des Wickelkörpers im Vordergrund steht, die zweite Ausführungsform zu bevorzugen ist, da es hier ohne weiteres möglich ist, soviele Abstützflächen wie erforderlich im Mittenbereich der Stege 13 vorzusehen.

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Patentansprüche

1. Wickelkörper zur Haarpflege mit einem Trägerelement (80), an dem Mittel zur Führung von mehreren um eine Mittellängsachse (112) des Trägerelements (80) angeordneten Stegen (13) vorgesehen sind, wobei die Stege (13) mittels Stellmittel (23) in unterschiedliche Positionen bringbar sind, um einen Körper mit unterschiedlichen Außendurchmessern zu bilden, dadurch gekennzeichnet, daß jeder Steg (13) eine Aussparung (39, 104) über seine Längserstreckung aufweist, mit der die Abschnitte eines benachbart angeordneten Steges (13) in jeder Positionierung der Stege formschlüssig in Verbindung stehen.

2. Wickelkörper nach Anspruch 1, dadurch gekennzeichnet, daß die Stege (13) beidends des Trägerelementes (80) in Drehlagern (18, 19, 21; 12, 46) aufgenommen sind.

3. Wickelkörper nach Anspruch 2, dadurch gekennzeichnet, daß ein Drehlager als Lager mit offenen Lagerpfannen ausgebildet ist, wobei wenigstens ein Zapfen (18, 19) der Stege (13) an einem kreissegmentförmigen Abschnitt des Trägerelementes (80) sowie an einer Ringwand des Stellmittels (23) gelagert ist.

4. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß eine Drehachse (20) des Steges (13) im Bereich eines Endabschnittes des Steges (13) angeordnet ist.

5. Wickelkörper nach Anspruch 4, dadurch gekennzeichnet, daß die Drehachse (20) radial versetzt außerhalb des Profils des Steges (13) angeordnet ist.

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6. Wickelkörper nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß jeder Steg (13) im Bereich eines mittleren Abschnittes (34) randseitig einen Zapfen (25) aufweist, der in jeweils eine Leitkurve (24) der Stellmittel (23) eingreift, welches seinerseits drehbar am Trägerelement (80) festgelegt ist.

7. Wickelkörper nach dem Oberbegriff von Anspruch 1 oder nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß jeder Steg (13) bezüglich der Längsachse des Trägerelements (80) um ein Maß (A) axial verschiebbar gelagert ist.

8. Wickelkörper nach Anspruch 7, dadurch gekennzeichnet, daß der Steg (13) über Rastmittel (26, 27) an dem Stellmittel (23) in axialer Richtung festgelegt ist.

9. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß eine Drehung der Stege (13) mittels axialer Verschiebung und anschließender Verdrehung des Stellmittels (23) durchführbar ist.

10. Wickelkörper nach einem der Ansprüche 7 bis 9, dadurch gekennzeichnet, daß das Stellmittel einends am Trägerelement (80) und Stützmittel (29, 48) zur radialen Festlegung der Stege (13) anderenends am Trägerelement (80) vorgesehen sind.

11. Wickelkörper nach Anspruch 10, dadurch gekennzeichnet, daß die Stützmittel (29, 48) durch eine am Steg (13) in radialer Richtung verlaufende Zahnung (29) gebildet werden, die in einen Rand (48) eines Rohrbereichs (49) eingreifen.

12. Wickelkörper nach Anspruch 1, dadurch gekennzeichnet, daß jeder Steg (13) aus drei im wesentlichen bogenförmig zueinander angeordneten Längsleisten (32, 34, 37) besteht, die durch Querstege (33, 51) miteinander verbunden sind.

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13. Wickelkörper nach Anspruch 12, dadurch gekennzeichnet, daß das Trägerelement (80) einen rohrförmigen Abschnitt (14) mit umfangsseitigen Öffnungen (15) aufweist, die mit zwischen den Querstegen (33, 51) gebildeten Öffnungen zum Zwecke des Luftauslasses zusammenwirken.

14. Wickelkörper nach Anspruch 12 oder 13, dadurch gekennzeichnet, daß die Querstege (51) mit borstenförmigen Fortsätzen versehen sind.

15. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß eine Außenseite (36) einer Längsleiste (34) eines Steges (13) eine bogenförmige Aussparung (39) dergestalt aufweist, daß in jeder radialen Positionierung der Stege (13) eine Kante, insbesondere eine Vorderkante (38) der Längsleiste (37) eines unmittelbar benachbarten Steges (13) Formschluß zur Aussparung (39) aufweist.

16. Wickelkörper nach einem der Ansprüche 12 bis 15, dadurch gekennzeichnet, daß die Unterseite (35) der einen Längsleiste (34) im Profil der Oberseite der weiteren Längsleiste (32) angepaßt ist.

17. Wickelkörper nach einem der Ansprüche 12 bis 16, dadurch gekennzeichnet, daß sich eine Längskante (41) der Längsleiste (32) auf dem Außenmantel des rohrförmigen Abschnitts (14) in jeder Positionierung der Stege (13) abstützt.

18. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß am Trägerelement (80) wenigstens sechs Stege (13) gelagert sind, die blütenkelchartig aufeinanderliegen, wobei in der Position des kleinsten Durch-

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messers die Längsleisten (32, 34, 37) jeweils benachbarter Stege (13) sowie die Öffnungen (15) im rohrförmigen Abschnitt (14) und im Bereich der Querstege (33, 51) benachbarter Stege (13) übereinanderliegend zur Deckung kommen.

19. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß mit größer werdendem Durchmesser des Wickelkörpers sich Längsleisten (32, 34, 37) mehr und mehr vor die Öffnungen (15) im rohrförmigen Abschnitt (14) des Trägerelements (80) schieben.

20. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Stellmittel (23) zweidimensionale Leitkurven (24) aufweist, die in einer zur Mittellängsachse (112) senkrechten Ebene spiralig verlaufen.

21. Wickelkörper nach dem Oberbegriff von Anspruch 1, dadurch gekennzeichnet, daß die Stege (13) beidends des Trägerelements (80) in Schubführungen aufgenommen sind.

22. Wickelkörper nach Anspruch 21, dadurch gekennzeichnet, daß die Schubführungen als Kammern (90, 92) ausgebildet sind, in denen Abschnitte der Stege (13) formschlüssig geführt sind.

23. Wickelkörper nach Anspruch 21 oder 22, dadurch gekennzeichnet, daß die Führung der Stege (13) spitzwinklig, insbesondere in einem Winkel zwischen 10° und 80°, bevorzugt in einem Winkel von etwa 45°, bezogen auf die Längsmittelachse (112) erfolgt.

24. Wickelkörper nach Anspruch 23, dadurch gekennzeichnet, daß beidends des Trägerelements (80) Schrägflächen (98) bzw. Böden (94) angeformt sind, an denen sich Führungsflächen (95, 97) der Stege (13) mit korrespondierender Schräge abstützen.

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25. Wickelkörper nach Anspruch 23 oder 24, dadurch gekennzeichnet, daß am rohrförmigen Abschnitt (14) des Trägerelements (80) weitere Schrägflächen (99) angeformt sind, die mit entsprechend geformten Führungsflächen (96) der Stege (13) korrespondieren.

26. Wickelkörper nach einem der Ansprüche 1, 21 bis 25, dadurch gekennzeichnet, daß das Stellmittel (23) dreidimensionale Leitkurven (24) aufweist, die in einer zur Mittellängsachse (112) senkrechten Ebene spiralig und in Bezug auf die Längsmittelachse mit schraubenförmiger Steigung verlaufen, wobei das Verhältnis der Steigung der Spirale zur Steigung der Schraube insbesondere solche Werte annimmt, die sich durch den Tangens des Winkels der Stegführung ergeben.

27. Wickelkörper nach Anspruch 26, dadurch gekennzeichnet, daß das Stellmittel (23) leitkurvenseitig eine kegelstumpfförmige Ausnehmung (115) aufweist und sich flächig auf Stegen (110) korrespondierende Steigung am Trägerelement (80) drehbar abstützt.

28. Wickelkörper nach dem Oberbegriff von Anspruch 1 oder einem der Ansprüche 21 bis 27, dadurch gekennzeichnet, daß einends der Stege (13) angeformte Zapfen (25) jeweils in eine Leitkurve (24) des Stellmittels (23) eingreifen, wobei die Stege (13) infolge der Betätigung des Stellmittels (23) sowohl in radialer als auch in axialer Richtung bezüglich der Längsmittelachse (112) formschlüssig geführt sind.

29. Wickelkörper nach Anspruch 28, dadurch gekennzeichnet, daß anderenends der Stege (13) eine winklige Nase (86) im Bereich der Führungsfläche (97) angeformt ist, die von einem Abschnitt (88) übergriffen ist, so daß die Stege (13) in einem Kanal (116) formschlüssig geführt sind.

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30. Wickelkörper nach einem der Ansprüche 1, 21 bis 29, dadurch gekennzeichnet, daß jeder Steg aus zwei Längsleisten (102, 106) besteht, die durch Querstege (118) miteinander verbunden sind.

31. Wickelkörper nach Anspruch 30, dadurch gekennzeichnet, daß das Trägerelement (80) einen rohrförmigen Abschnitt (14) mit umfangsseitigen Öffnungen (15) aufweist, die mit zwischen den Querstegen (118) gebildeten Öffnungen zum Zwecke des Luftauslasses zusammenwirken.

32. Wickelkörper nach einem der Ansprüche 30, 31, dadurch gekennzeichnet, daß die Querstege (118) mit borstenförmigen Fortsätzen (16) versehen sind.

33. Wickelkörper nach einem der Ansprüche 1, 21 bis 32, dadurch gekennzeichnet, daß eine Längsleiste (102) des Steges (13) eine nutförmige Aussparung (104) aufweist, in die wenigstens Abschnitte der Längsleiste (106) eines unmittelbar benachbarten Steges formschlüssig in jeder radialen Positionierung der Stege (13) eingreifen.

34. Wickelkörper nach einem der Ansprüche 30 bis 33, dadurch gekennzeichnet, daß ein Randbereich der Längsleisten (106) kammartig angeordnete Schlitze (108) aufweist, die mit den Öffnungen zwischen den Querstegen (118) korrespondieren.

35. Wickelkörper nach einem der Ansprüche 30 bis 34, dadurch gekennzeichnet, daß die Längsleiste (106) wenigstens in einem axialen Abschnitt eine nutförmige Aussparung (96), der am Boden eine schiefe Ebene bildet, aufweist und sich formschlüssig auf einem eine korrespondierende schiefe Ebene bzw. schräge Fläche (99) bildenden Steg am Trägerelement (80) abstützt.

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36. Wickelkörper nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Stellmittel (23) mittels einer Kappe (30) und daran angeformte Federarme (31) am Trägerelement (80) durch Klipsen gesichert ist.

37. Wickelkörper nach Anspruch 36, dadurch gekennzeichnet, daß eine zentrale Aussparung der Kappe einen Knopf (30) aufnimmt, der die Spreizung eines Federelementes (53) bewirkt, welches in einer Ringnut eines pilzförmigen Bereiches (52) des Trägerelements (80) eingreift.

38. Wickelkörper nach einem der vorhergehenden Ansprüche, gekennzeichnet durch seine Verwendung als Lockenwickler mit variabel einstellbarem Durchmesser.

39. Wickelkörper nach einem der Ansprüche 1 bis 37, gekennzeichnet durch seine Verwendung als Aufsatzbürste eines Warmluft-haarpflegegerätes mit variabel einstellbarem Durchmesser, wobei das Trägerelement (80) von Warmluft durchströmt wird.

40. Wickelkörper nach einem der Ansprüche 1 bis 37, gekennzeichnet durch seine Verwendung als Haarbehandlungsabschnitt eines elektrisch bzw. gasbetriebenen Lockenstabes mit variabel einstellbarem Durchmesser.

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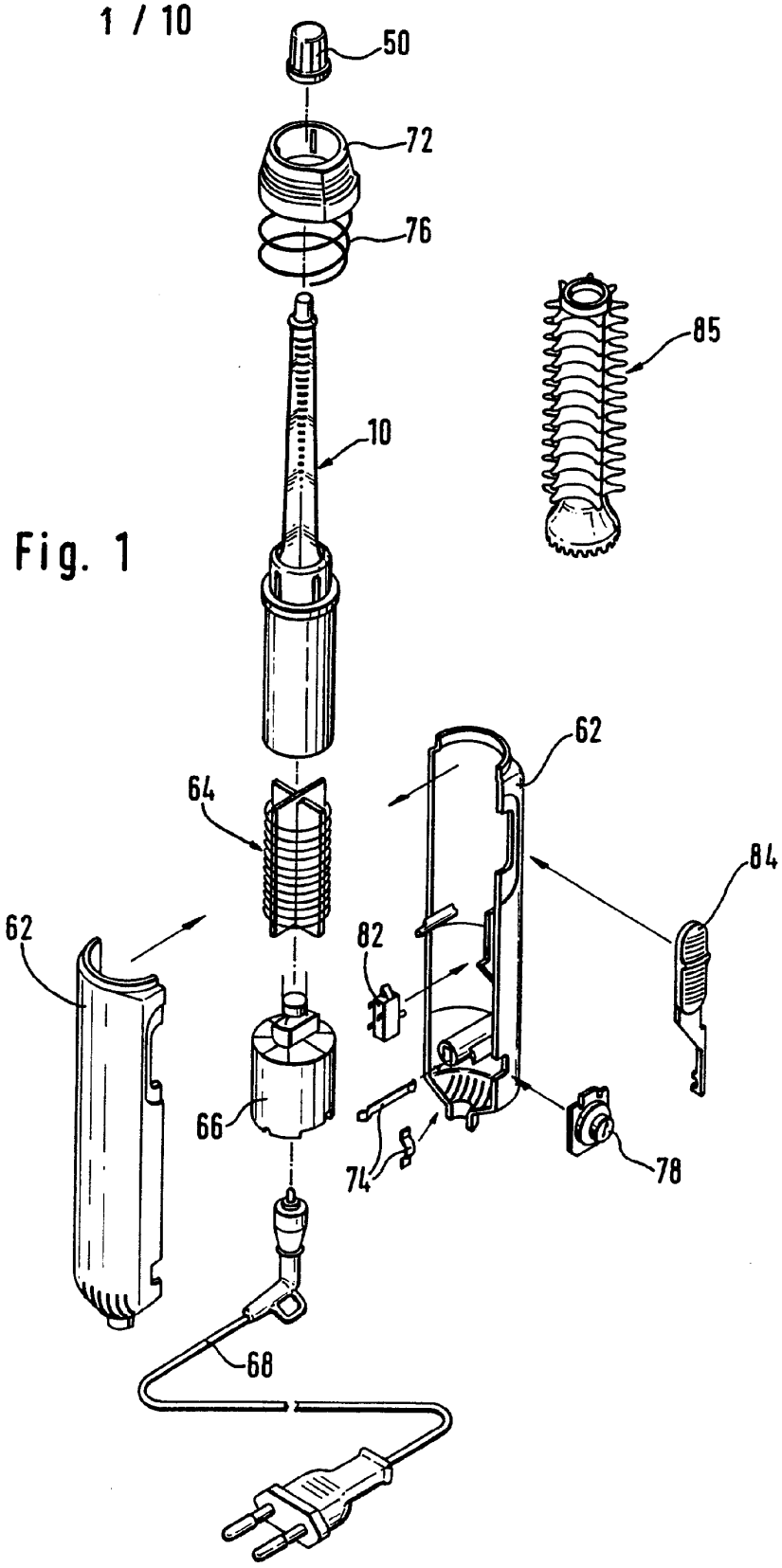
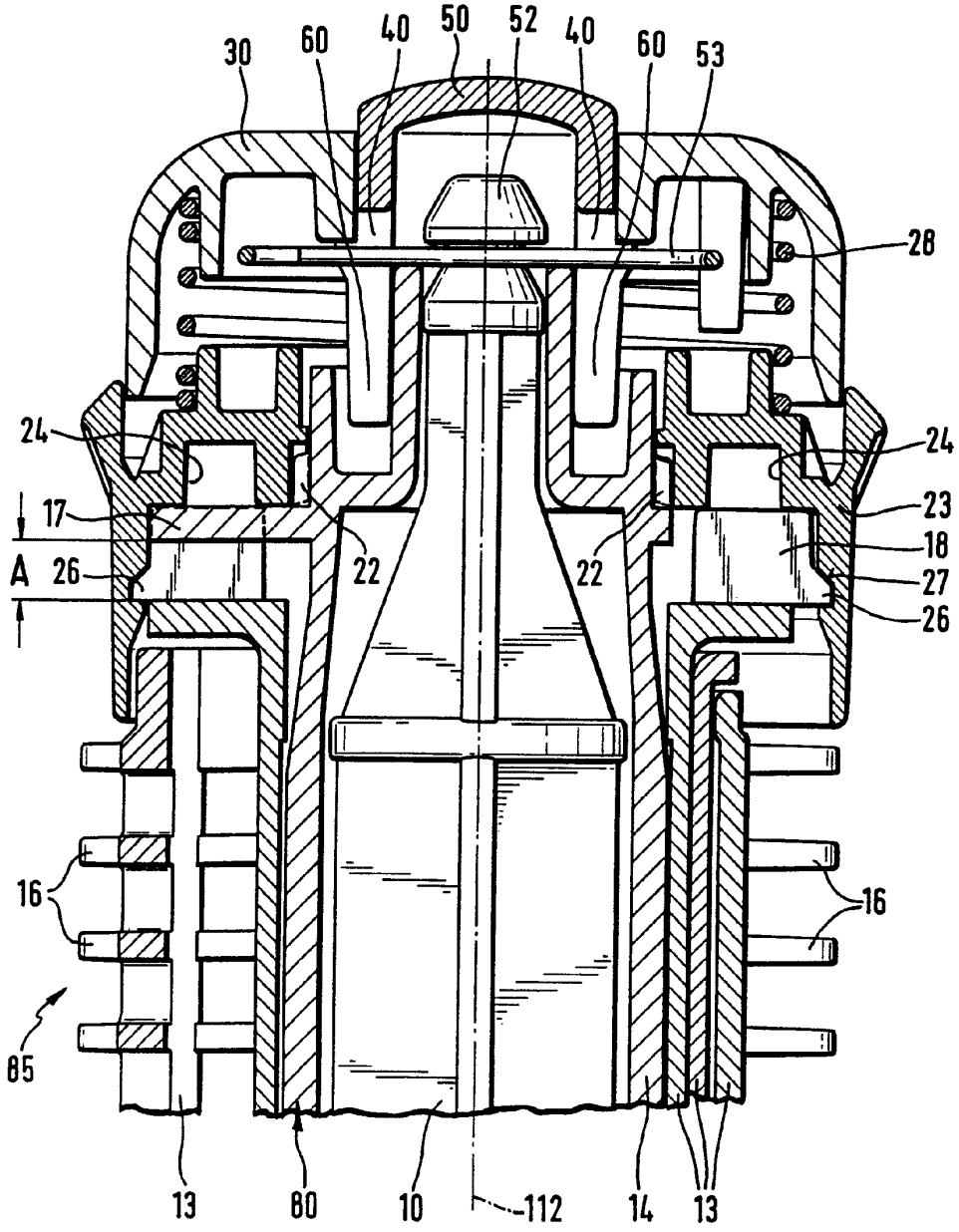


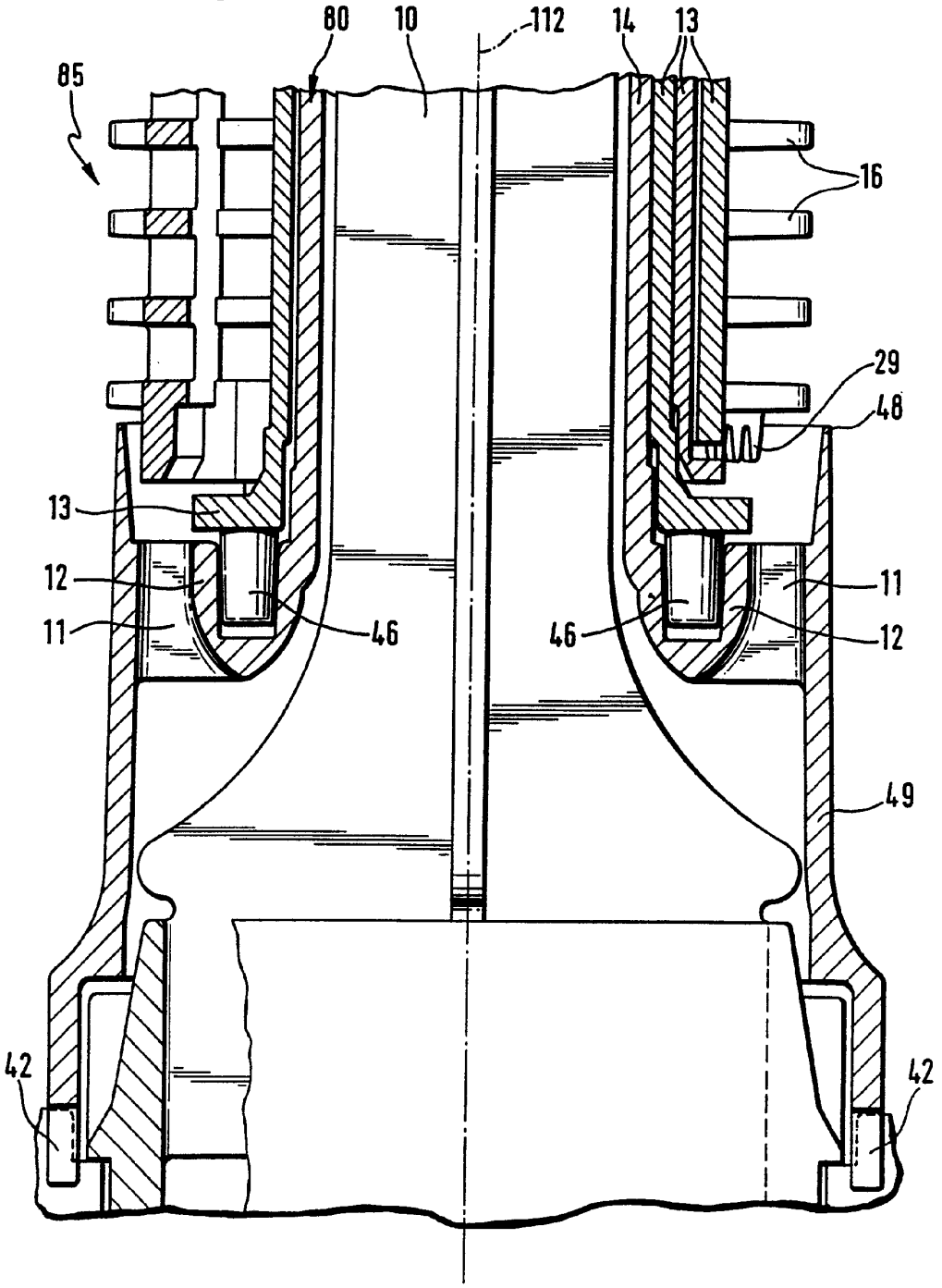
Fig. 1

Fig. 2



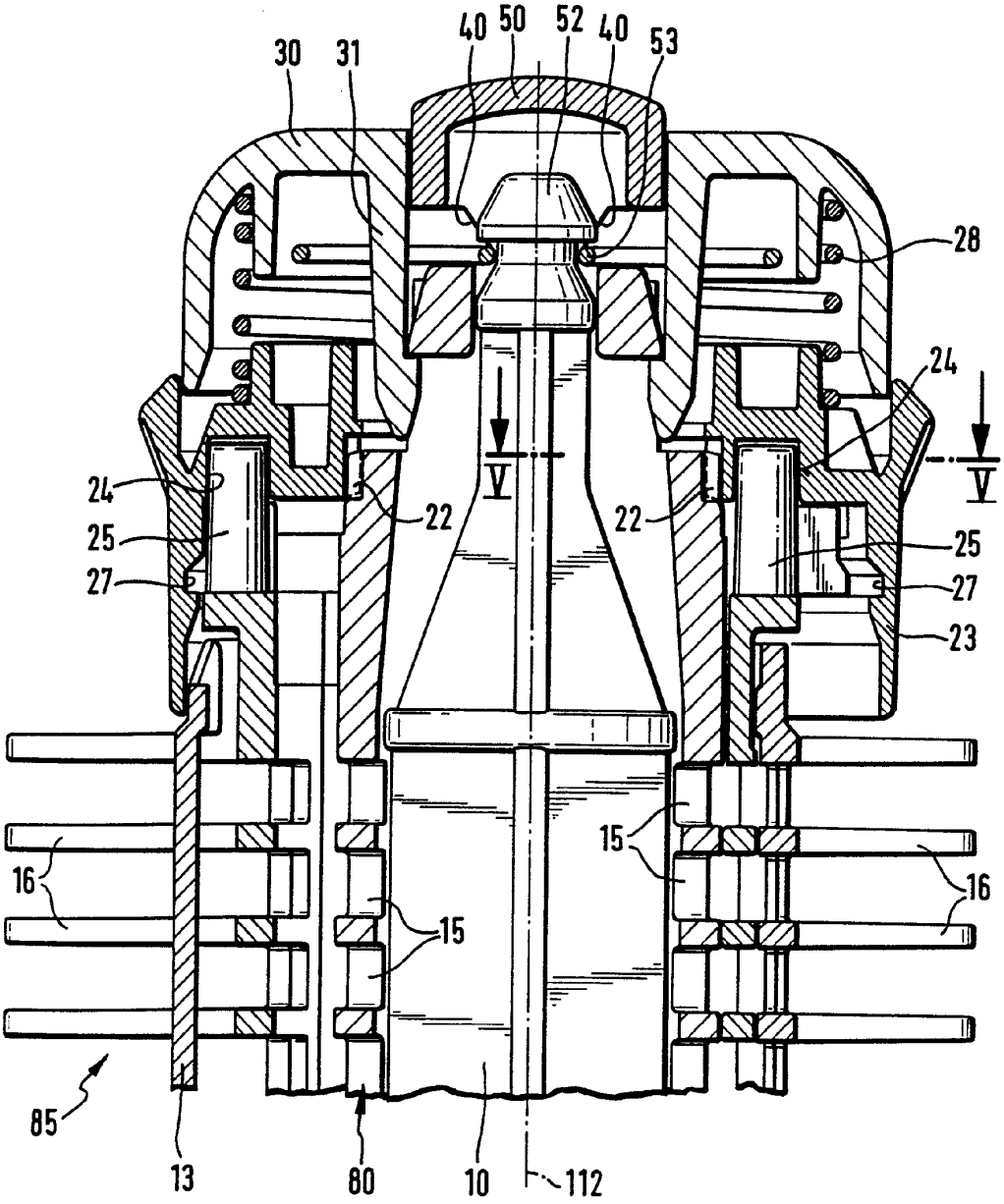
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Fig. 3



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Fig. 4



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Fig. 5

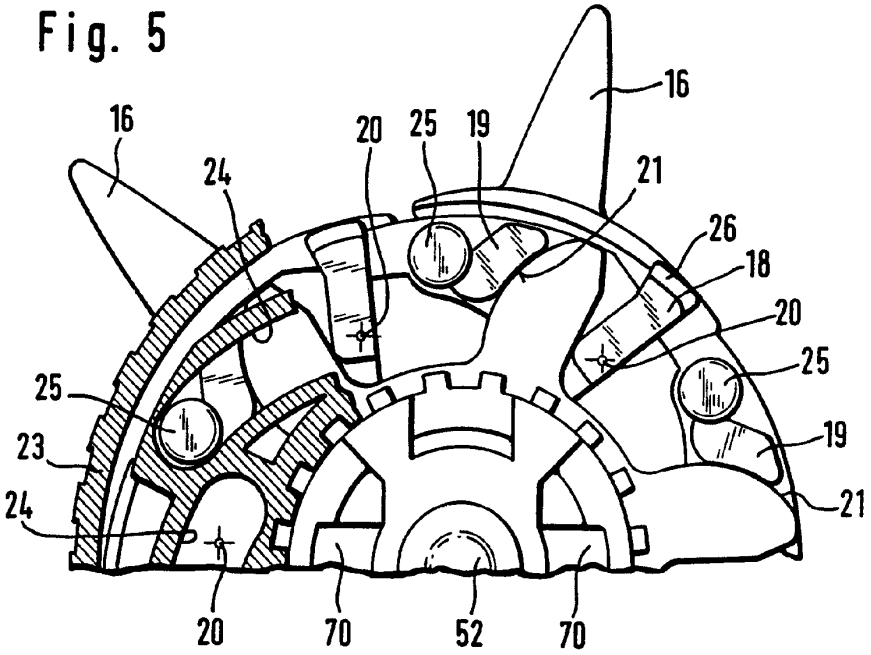

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Fig. 6

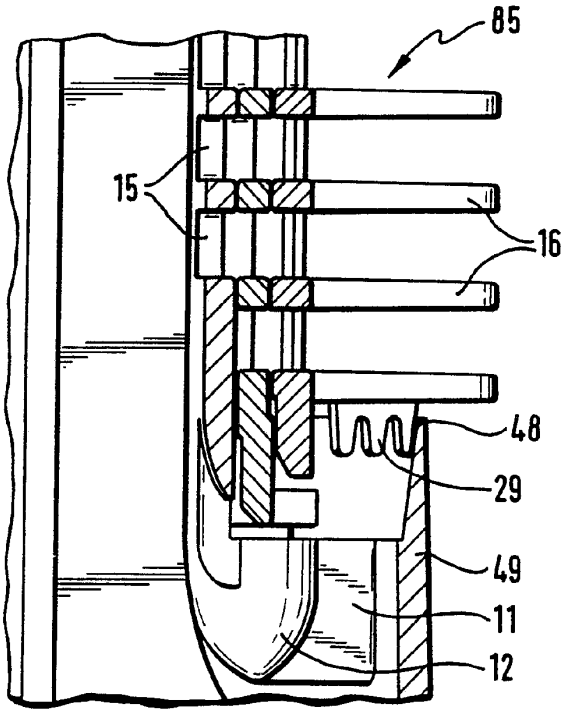

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Fig. 7

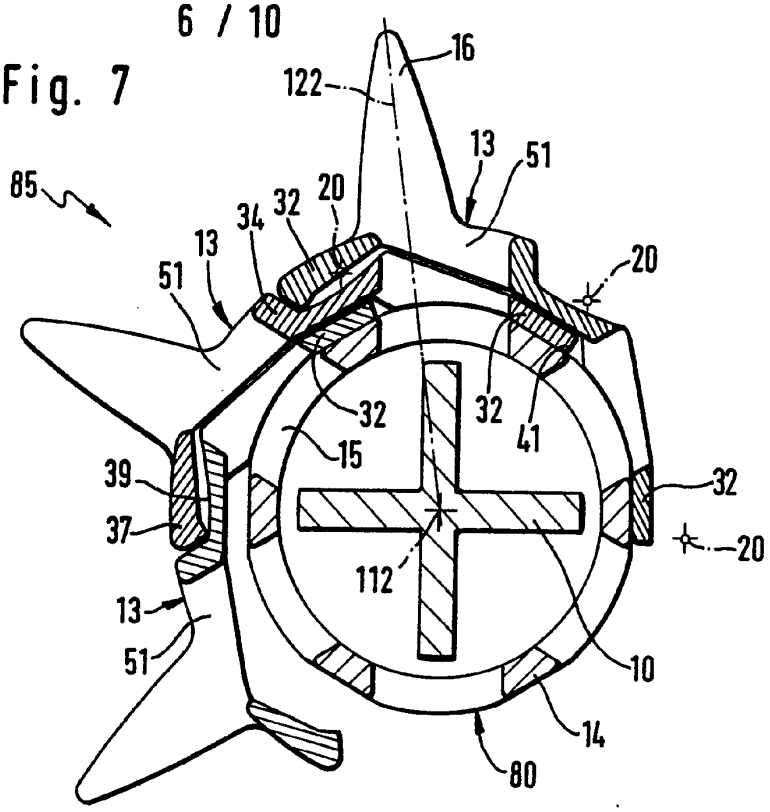

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Fig. 8

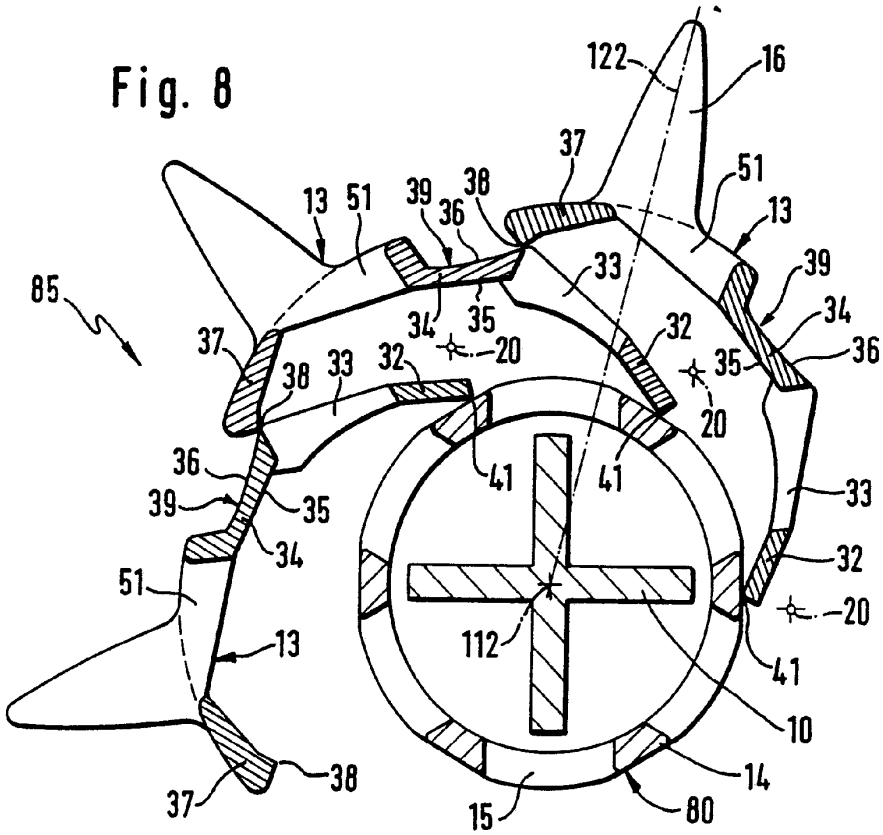
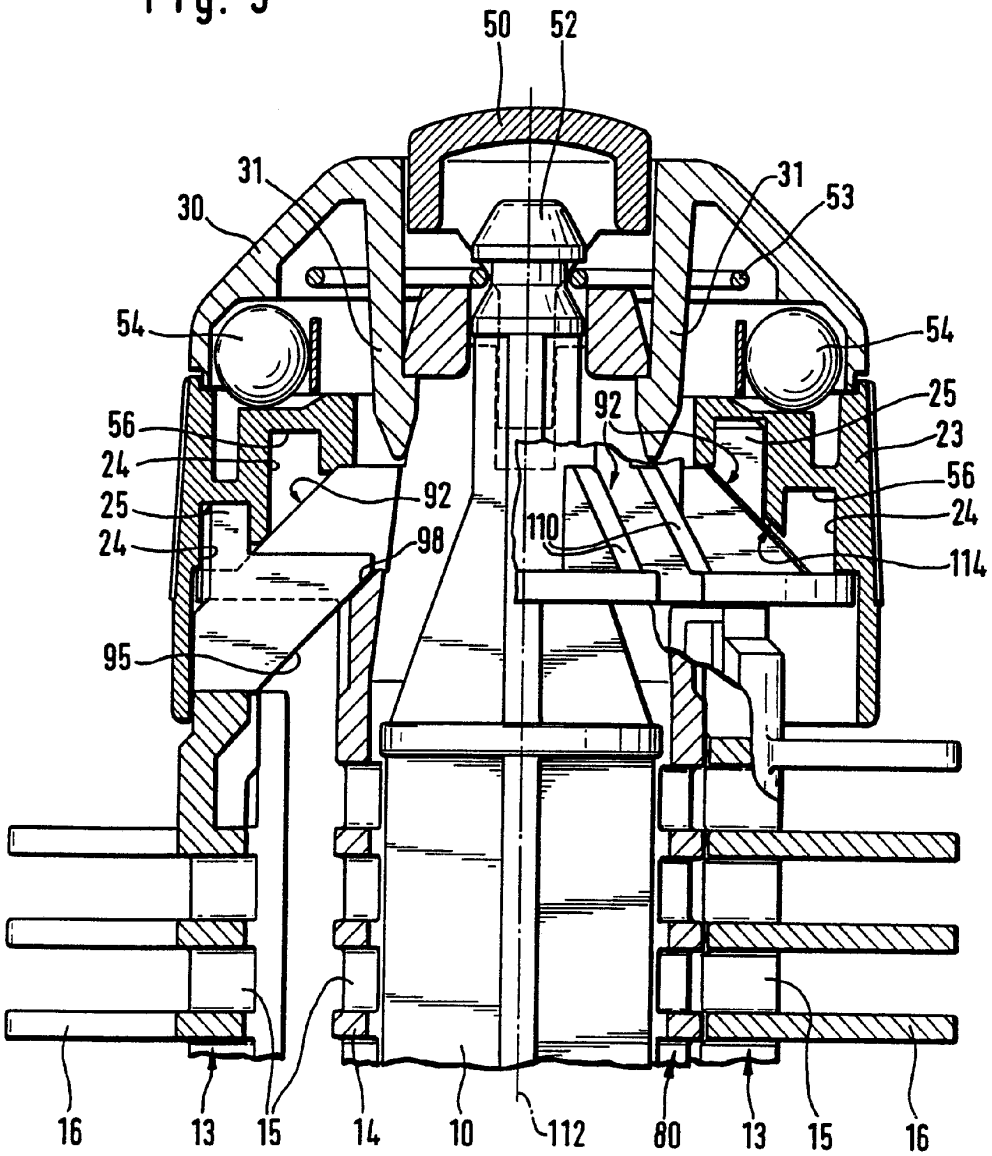
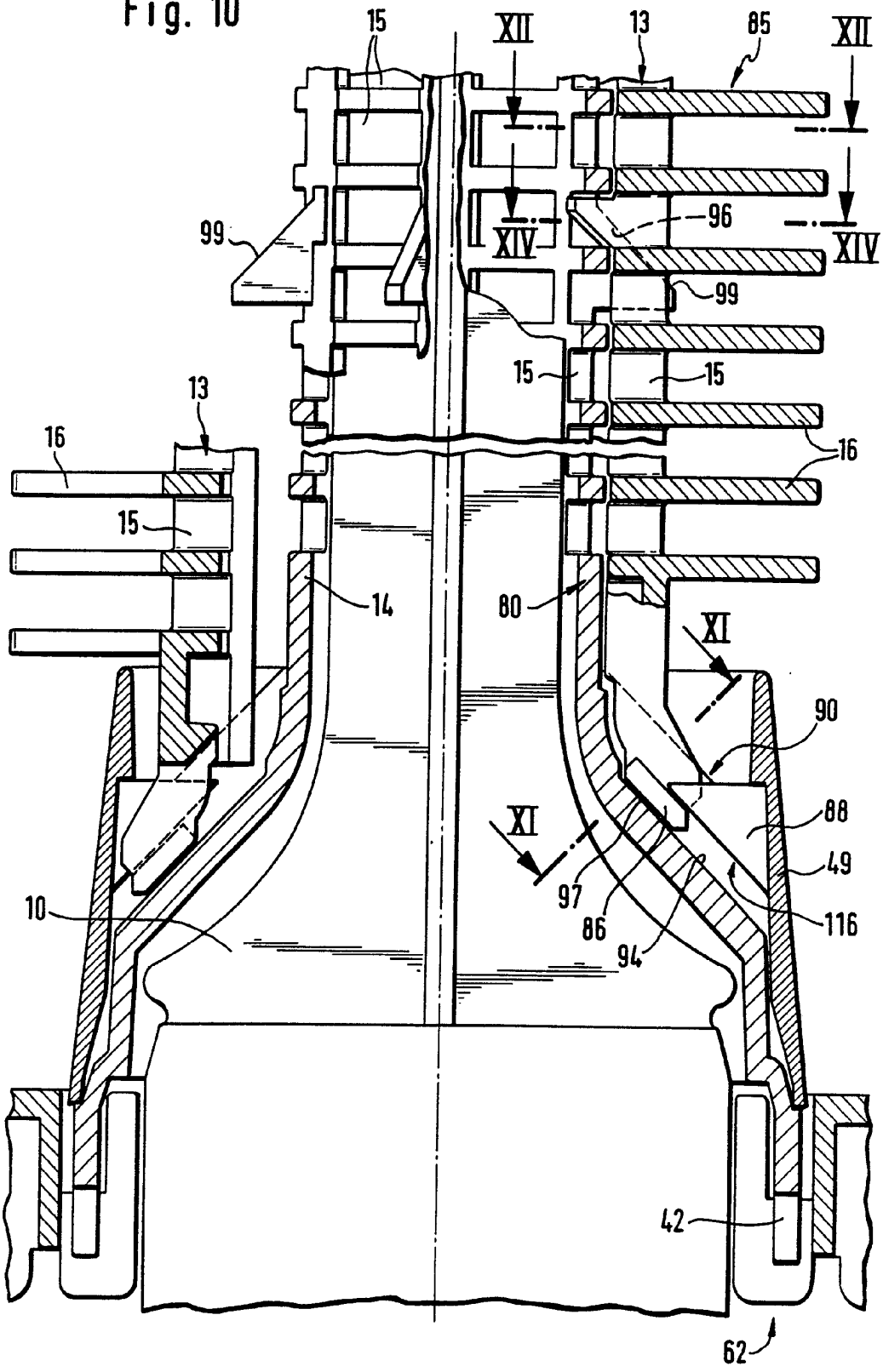

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Fig. 9



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Fig. 10



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Fig. 11

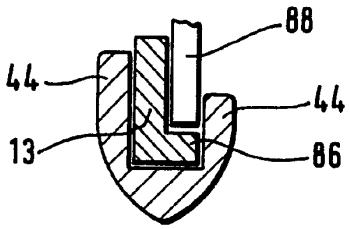

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Fig. 12

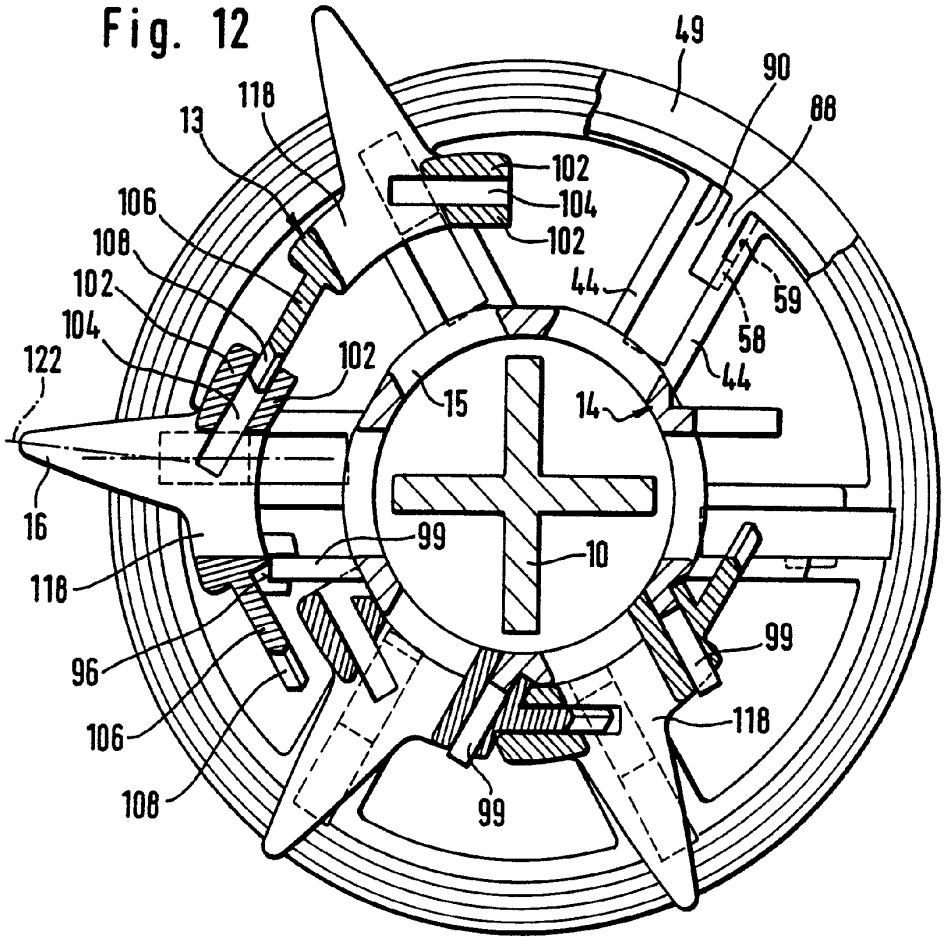

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Fig. 14

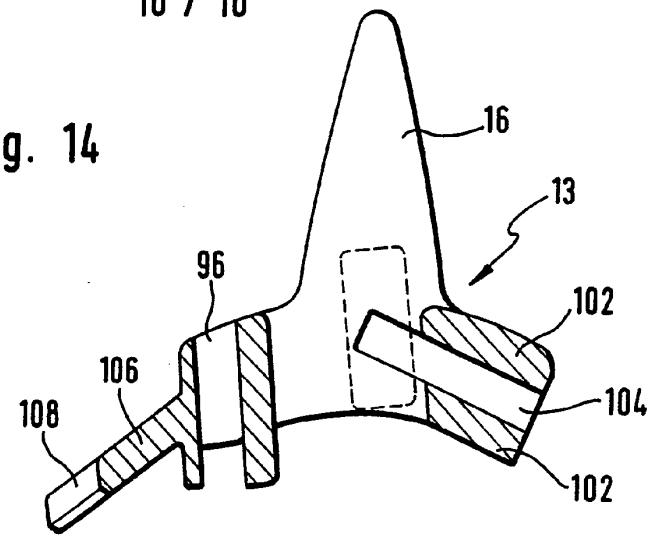


Fig. 13

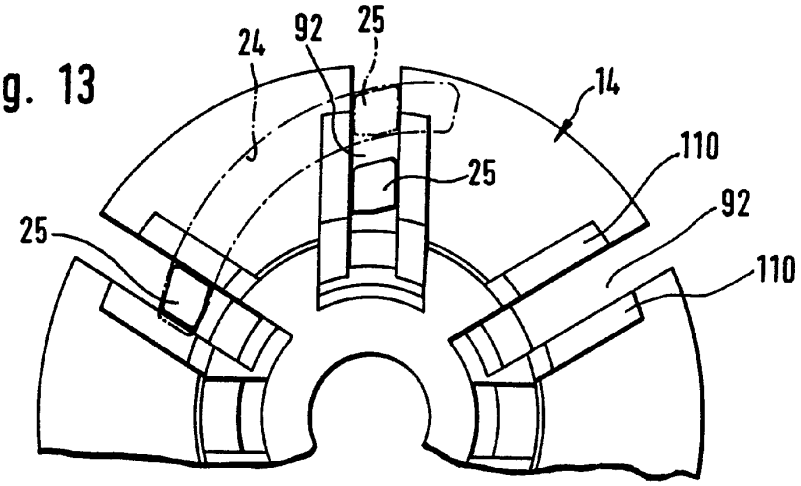
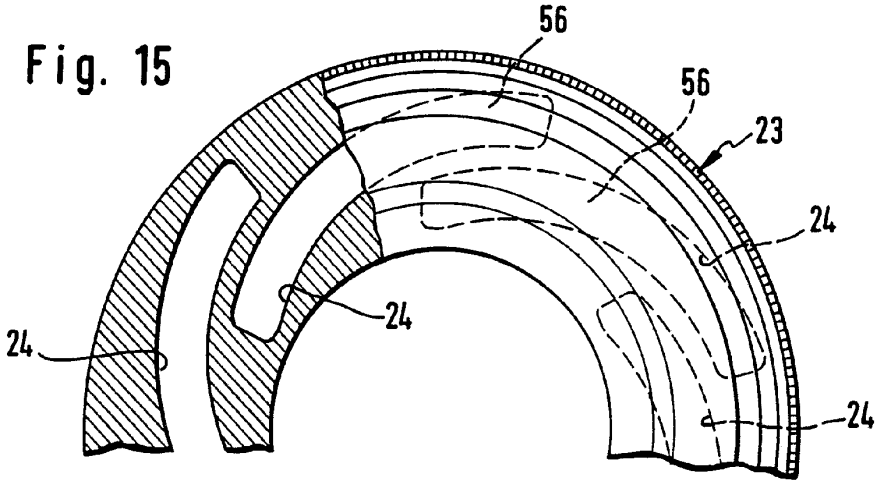


Fig. 15



INTERNATIONAL SEARCH REPORT

International Application No PCT/DE 91/00948

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl.[5] A45D 1/18; A45D 2/24; A45D 20/50

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
Int.Cl.[5]	A45D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	EP, A, 0 219 783 (HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN) 29 April 1987 see page 15,line 3 - line 26;figures 17-20	1
A	US, A, 3 583 409 (R. RIOS) 8 June 1971 (cited in the application) see abstract	38
A	FR, A, 2 419 044 (DENTSPLY INTERNATIONAL INC.) 5 October 1979 see page 3,line 17 - line 36; figures	39
A	US, A, 3 921 648 (G. BARRADAS) 25 November 1975 see abstract	40
A	US, A, 3 419 019 (E. HOFFMANN ET AL.) 31 December 1968	
A	DE, A, 2 529 026 (O. HÜBNER) 5 May 1977 (cited in the application)	

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* Special categories of cited documents: [10]

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"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
12 March 1992 (12.03.92)	24 March 1992 (24.03.92)
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	

Form PCT/ISA/210 (second sheet) (January 1985)

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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. DE 9100948 SA 53925

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0219783	29-04-87	DE-A- 3544275	23-04-87
		JP-A- 62094105	30-04-87
		US-A- 5020552	04-06-91
		US-A- 4856542	15-08-89
US-A-3583409	08-06-71	None	
FR-A-2419044	05-10-79	US-A- 4191200	04-03-80
		CA-A- 1093926	20-01-81
		DE-A,C 2909386	13-09-79
		GB-A,B 2018586	24-10-79
		JP-A- 54127759	03-10-79
US-A-3921648	25-11-75	US-E- RE30866	16-02-82
US-A-3419019		None	
DE-A-2529026	05-05-77	None	

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INTERNATIONALER RECHERCHENBERICHT

PCT/DE 91/00948

Internationales Aktenzeichen

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben)[6]

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

Int.Kl. 5 A45D1/18; A45D2/24; A45D20/50

II. RECHERCHIERTE SACHGEBIETE

Recherchierter Mindestprüfstoff [7]

Klassifikationssytem	Klassifikationssymbole
Int.Kl. 5	A45D

Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen [8]

III. EINSCHLAGIGE VEROFFENTLICHUNGEN [9]

Art.°	Kennzeichnung der Veröffentlichung [11], soweit erforderlich unter Angabe der maßgeblichen Teile [12]	Betr. Anspruch Nr.[13]
A	EP,A,0 219 783 (HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN) 29. April 1987 siehe Seite 15, Zeile 3 - Zeile 26; Abbildungen 17-20	1
A	US,A,3 583 409 (R. RIOS) 8. Juni 1971 in der Anmeldung erwähnt siehe Zusammenfassung	38
A	FR,A,2 419 044 (DENTSPLY INTERNATIONAL INC.) 5. Oktober 1979 siehe Seite 3, Zeile 17 - Zeile 36; Abbildungen	39
A	US,A,3 921 648 (G. BARRADAS) 25. November 1975 siehe Zusammenfassung	40
A	US,A,3 419 019 (E.HOFFMANN ET AL.) 31. Dezember 1968	

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° Besondere Kategorien von angegebenen Veröffentlichungen [10] :

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"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist

IV. BESCHEINIGUNG

Datum des Abschlusses der internationalen Recherche	Absendedatum des internationalen Recherchenberichts
12.MAERZ 1992	24. 03. 92
Internationale Recherchenbehörde	**Unterschrift des bevollmächtigten Bediensteten**
EUROPAISCHES PATENTAMT	MARANGONI G.

Formblatt PCT/ISA/210 (Blatt 2) (Januar 1985)

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III. EINSCHLÄGIGE VERÖFFENTLICHUNGEN (Fortsetzung von Blatt 2)

Art °	Kennzeichnung der Veröffentlichung, soweit erforderlich unter Angabe der maßgeblichen Teile	Betr. Anspruch Nr.
A	DE,A,2 529 026 (O. HÜBNER) 5. Mai 1977 in der Anmeldung erwähnt ---	

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ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT
ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR. DE 9100948
SA 53925

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben.
Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am 12/03/92
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Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie		Datum der Veröffentlichung
EP-A-0219783	29-04-87	DE-A-	3544275	23-04-87
		JP-A-	62094105	30-04-87
		US-A-	5020552	04-06-91
		US-A-	4856542	15-08-89
US-A-3583409	08-06-71	Keine		
FR-A-2419044	05-10-79	US-A-	4191200	04-03-80
		CA-A-	1093926	20-01-81
		DE-A,C	2909386	13-09-79
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		JP-A-	54127759	03-10-79
US-A-3921648	25-11-75	US-E-	RE30866	16-02-82
US-A-3419019		Keine		
DE-A-2529026	05-05-77	Keine		

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Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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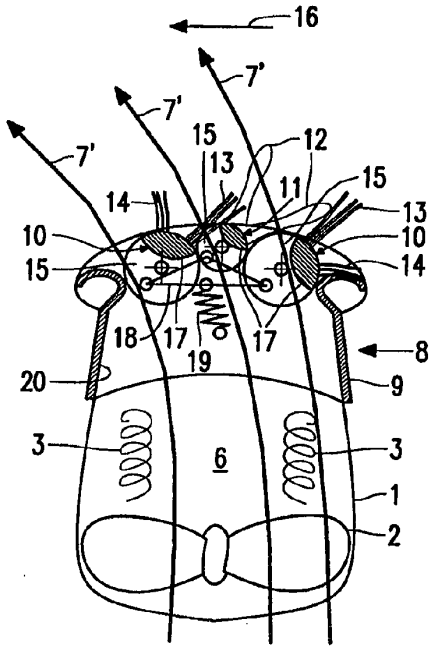
(81) Designated States: CN, JP, KR, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

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With international search report.

(54) Title: INSTRUMENT FOR STYLING HAIR

(57) Abstract

An instrument for styling hair comprises a movable carrier (10, 11), elongate hair guides (12, 13, 14) which project from the carrier (10, 11), and a passage (15) for allowing hot air to pass through. The passage (15) and the carrier (10, 11) being adapted to influence the discharge direction in dependence upon the position of the carrier (10, 11) in such a manner that a pivotal movement in a first direction of the carrier (10, 11) with the hair guides (12, 13, 14) which project therefrom results in a change of the discharge direction through the passage (15) in a substantially opposite second direction. During use this prevents hairs just released by the hair guides passing through the hair from being muddled up again. The hair–style is better under control and less combing and brushing is necessary.



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Instrument for styling hair.

The invention relates to an instrument for styling hair.

Such an instrument is known from WO-A-94/09669, the instrument comprising: at least one carrier which is movably supported by the housing, elongate hair guides which project from the carrier, and at least one passage for discharging hot air in a discharge direction away from the housing. The passage and the carrier are adapted to influence the discharge direction in dependence on the position of the carrier relative to the housing.

According to said German Patent Application the hair can be styled and dried more effectively by influencing the discharge direction and it is possible, in particular, to dry the parts of the hair which are situated near the scalp, as a result of which the remains up better. The stream of hot air is then led past the head, which precludes an unpleasantly strong heating of the scalp according to said Patent Application. As the hair guides are moved through the hair the hair guides are subjected to a force which causes them to be pivoted in a direction opposed to that in which the hair guides are moved through the hair. The discharge direction of the air then changes into the same direction as that in which the hair guides pivot, as result of which the discharge direction during combing and/or brushing is each time opposed to the direction of brushing and/or combing.

It is an object of the invention to provide an instrument by means of which the hair can be styled more rapidly and better.

According to the present invention this object is achieved in that the carrier is adapted to influence the passage in such a manner that a movement of the hair guides which project from the carrier in a first direction with respect to the housing results in a change of the discharge direction through said passage in a second direction substantially opposite to said first direction.

When an instrument in accordance with the invention is used, this prevents hairs just released by the hair guides passing through the hair from being muddled up again. As a result, the hair-style during combing and/or brushing is better under control and less combing and brushing is necessary, which saves time and affects the resilience of the hair to smaller extent.

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Since the imbricate structure of the hair is not disturbed by the outgoing air stream but is rather enhanced when an instrument in accordance with the invention is used, the hair will generally be more glossy after styling by means of an instrument in accordance with the invention than after styling by means of known instruments.

Special embodiments of the proposed invention have been defined in Claims 2-14.

The instrument can be constructed, for example, as an attachment to be fitted onto a hair-dryer unit, as a one-piece hair dryer or hot-air brush, or as a combination of a hair-dryer unit with an attachment coupled thereto.

The invention will be described in more detail hereinafter with reference to embodiments given by way of examples, with reference to the drawings. In the drawings:

Fig. 1 is a side view showing a hair dryer equipped with an instrument in accordance with an embodiment of the invention,

Fig. 2 is a side view of the same hair dryer, taken perpendicularly to the side view of Fig. 1,

Fig. 3 is a diagrammatic sectional view taken on the line III-III in Fig. 1,

Fig. 4 is a view similar to Fig. 3 in another operating condition, and

Fig. 5 is a sectional view of an alternative embodiment of the instrument in accordance with the invention.

First of all, the instrument in accordance with the most favored embodiment as shown Figs. 1-4 will be described in detail and elucidated. Subsequently, attention will be paid to alternative embodiments as shown, for example, in Fig. 5. In the drawings like parts bear identical reference numerals.

Figs. 1-4 show a device for styling the hair while its is being dried, which device is referred to hereinafter as a hair dryer for the sake of simplicity. The hair dryer comprises a hair dryer unit 1 , which accommodates a fan 2 and heating elements 3. The fan 2 and the heating elements 3 are disposed in an air channel 6 which extends from air inlets 5 through the hair dryer unit 1. The air flowing through the channel 6 is represented by means of arrows 7, 7' in Figs. 3 and 4.

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An instrument for hair-styling, formed by an easy-to-exchange attachment 8, is mounted on the hair dryer unit 1. This attachment 8 comprises inter alia a housing 9, carriers 10, 11 which are pivotably supported by the housing 9, and elongate hair guides 12, 13, 14 which project from the carriers 10, 11. The hair guides 13, 14 are not shown in Fig. 1. The attachment 8 further has passages for hot air in discharge directions away from the housing 8 (which directions are indicated by parts of the arrows 7, 7" in the area of the passages 15). The hair guides 12, 13, 14 form
combs and brushes for ordering and styling the hair.

The carriers 10, 11 are adapted to influence the passages 15 in such a manner that a pivotal movement of the carriers 10, 11 with the hair guides 12, 13, 14, which project therefrom, in a first direction relative to the housing 8 results in a change or at least deflection or excursion of the air stream 7, 7' in the area of the passages in a second substantially opposite direction. If, for example as is shown in Fig. 4, the combs and brushes formed by the hair guides 12, 13, 14 and the carriers 10, 11 from which they project are pivoted to the right in that the hair dryer is moved through the hair to the left (in the direction indicated by an arrow 16), the air stream 7' issuing from the passages 15 is also directed to the left. As a result of this, it is always directed in the combing direction. The effect of this is that during combing and/or brushing of the hair the air stream is guided past the head in a more parallel direction than in the case that it simply issues frontally from the attachment 8, and that hair which has been urged into a certain position by the hair guides 12, 13, 14 is not immediately blown out of this position as soon as it is freed from the hair guides 12, 13, 14. This results in a better styling control, a more rapid styling and less loss of resilience of the hair since the hair needs to be heated, brushed and combed less frequently in order to obtain a desired hair-style. As in the case that the proposed attachment 8 is used the nearly dry hair is first heated and is given the desired orientation and shape by means of the hair guides 12, 13, 14 in the heated condition, a better hair-styling performance is achieved.

For influencing the direction in which the air stream 7, 7' flows through the passages 15 the attachment 8 has air guiding surfaces 17 which are pivoted when the carriers 10, 11 are pivoted.

The area of the passages does not decrease when the discharge direction is changed, as a result of which the air flow is not reduced or only to a very small extent when the discharge direction is changed. In its turn, this has the advantage that when the discharge direction is changed, and the heating elements 3 deliver a constant power, the temperature of

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the outflowing air decreases or increases hardly, even if the air stream would be deflected along with the hair guides. It is of particular importance that this precludes a sudden excessive heating of the scalp and the hair.

In the proposed hair-styling instrument the effective area of the passages 15 increases when the direction of the outflowing air 7' is changed. This has the advantage that the increase in air resistance caused by the fact that the air stream is deflected is compensated by the increase in the overall effective passage area. Thus, variations in air output owing to the deflection of the air stream can remain limited.

In order to obtain a simple construction of the attachment 8 the air guiding surfaces 17 have been arranged on the carriers 10, 11.

In the proposed attachment 8 deflection of the outflowing air in a direction opposite to that in which the hair guides 12, 13, 14 are pivoted is effected in that the air guiding surfaces 17 are each arranged between passages at opposite sides thereof and are each pivotable from a position oriented substantially transversely to the discharge direction to a position oriented more parallel to the discharge direction. In the position oriented transversely to the discharge direction the air guiding surfaces 17 divide the inflowing air substantially uniformly into air streams which flow past these air guiding surfaces 17 and the relevant carriers 10, 11 (see Fig. 3). When the hair guides 12, 13, 14 and hence the carriers 10, 11 are pivoted the air guiding surfaces 17 are tilted from a position oriented substantially transversely to the air stream 7 to a position oriented obliquely relative the air stream 7', as a result of which the air stream is deflected mainly in one direction.

The air guiding surfaces 17 are convexly curved at least in the plane in which they are pivotable, i.e. about the respective pivotal axes. This has the advantage that the air guiding surfaces 17 present a comparatively low air resistance. Moreover, the air resistance presented by the air guiding surfaces 17 is comparatively constant.

Furthermore, as the carriers 10, 11 have a biconvex cross-sectional shape the surfaces of the carriers 10, 11 at the sides of the hair guides 12, 13, 14 also contribute to the deflection of the air stream 7' in the tilted position.

Although the number of carriers can be limited to one, the use of two or more carriers 10, 11 has the advantage that the carriers can be pivoted to a considerable extent and, as a consequence, the direction in which the air stream 7, 7' issues can be influenced considerably without the main outline of the attachment 8 being changed significantly. A limited change of the main outline promotes the ease of handling of the instrument.

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The carriers 10, 11 are coupled to one another by coupling means 18, which couple the carriers 10, 11 so as to cause these carriers 10, 11 to be pivoted jointly. As soon as one of the carriers 10, 11 is pivoted under the influence of the force exerted by the hair on the hair guides 12, 13 or 14 which project from this carrier 10, 11, the other one of the carriers 10, 11 is thus moved along, as a result of which an effective change of the direction in which the air stream issues is obtained. Moreover, it thus prevented that the air resistance caused by the carriers 10, 11 is increased in that they deflect the air stream 7, 7' in opposite directions.

In order to ensure that the carriers 10, 11 are each time pivoted back to the neutral position a resilient element 19 is arranged between the coupling 18 for the carriers 10, 11 and the housing 9, which resilient element urges the carriers 10, 11 into a neutral position. As a result, the air issues frontally from the attachment 8 once the attachment 8 has been taken out of the hair.

The hair guides 12, 13, 14 which project from the carriers 10, 11 are arranged in double rows of V-shaped cross-section, which are oriented parallel to the pivotal axis of the carriers 10, 11. As a result of this arrangement it is achieved that, even if the carriers 10, 11 have been pivoted fully to one side, as is shown in Fig. 4, a number of the hair guides project substantially perpendicularly from the main outline of the attachment 8 and effectively act upon the hair to be styled.

As the attachment comprises coarse hair guides 12, which form a comb, and fine hair guides 13, 14, which form brushes, the attachment can also be used for styling and drying very wet hair, into which the brushes cannot readily penetrate. The effect of the brushes increase gradually as the hair dries. It is then advantageous that the coarse hair guides 12 project farther from the main outline of the attachment than the finer hair guides 13, 14, so that the coarse hair guides 12 of the comb can also be introduced properly into hair when the fine hair guides 13, 14 of the brushes cannot yet properly penetrate into the hair.

At its side which is remote from the hair guides 12, 13, 14 the housing 8 has a coupling portion 20 for coupling to a hair dryer unit, as a result of which the shaving attachment can be exchanged simply. Such a hair dryer unit 1 preferably has a heating element having a power of at least 800 W, so that rapid drying is achieved but sufficient time is left for styling and, when the hair is nearly dry, excessive heating of the head and the hair is prevented.

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In the example shown in Fig. 5 the hair guides are all identical, the air guiding surfaces have concave instead of convex shapes, and the coupling between the carriers is constructed as a pivotable element having a toothed segment which meshes with toothed segments of the carriers 10. The resilient element for urging the carriers into the neutral position is also arranged between the housing 9 and the coupling 18 but is constructed as a pair of cooperating blade springs 19 instead of as a helical spring. In order to obtain extra grip on the hair to be styled, the housing has been provided with fixed hair guides 21 at opposite sides of the rows of pivotable hair guides 12.

Some of the many variants within the scope of the invention which have come within the expert's reach will be mentioned hereinafter. In the examples shown herein the instrument has been constructed as an attachment adapted to be mounted on a hair dryer unit. However, the instrument can also be constructed in such a manner that the housing also accommodates an air inlet, a fan and a heating element for heating air which passes through and is consequently integral with and, at least in normal use, not detachable from the hair dryer unit.

Moreover, it is possible to orient the outflowing air stream in a direction opposite to the pivoting direction of the hair guides by selectively closing the air outlet passages in response to the pivotal movement of the carrier and the enveloping surfaces which project from this carrier.

Claims:

1. An instrument for styling hair, comprising a housing (9), at least one carrier (10, 11) which is pivotably supported by the housing (9), elongate hair guides (12, 13, 14) which project from the carrier (10, 11) and which are movable along with the carrier, and at least one passage (15) for allowing hot air to pass through in a discharge direction away from the housing (9), the passage (15) and the carrier (10, 11) being adapted to influence the discharge direction in dependence upon the position of the carrier (10, 11) with respect to the housing (9), characterized in that the carrier (10, 11) is adapted to influence the passage (15) in such a manner that a movement of the hair guides (12, 13, 14) which project from the carrier (10, 11) in a first direction with respect to the housing (9) results in a change of the discharge direction through said passage (15) in a second direction substantially opposite to said first direction.

2. An instrument as claimed in Claim 1, further comprising at least one air guiding surface (17), which is movable along with the carrier (10, 11), for changing the direction of the air (7, 7') passing through the passage (15), in which the air guiding surface (17) and the carrier (10, 11) are constructed in such a manner that the effective discharge area of the passage (15) in a position of the carrier (10, 11) for deflecting the outflowing air (7') is at least equal to the effective discharge area of the passage (15) in a position of the carrier (10, 11) for the substantially straight passage of the outflowing air (7).

3. An instrument as claimed in Claim 2, in which the air guiding surface (17) and the carrier (10, 11) are constructed in such a manner that the effective discharge area of the passage (15) in a position of the carrier (10, 11) for deflecting the outflowing air (7') is greater than the effective discharge area of the passage (15) in a position of the carrier (10, 11) for the substantially straight passage of the outflowing air (7).

4. An instrument as claimed in Claim 3, in which the air guiding surface (17) is carried by the carrier (10, 11).

5. An instrument as claimed in Claim 3 or 4, in which the air guiding surface (17) is disposed between passages (15) at opposite sides of said air guiding surface (17) and is pivotable between a position oriented substantially transversely to the discharge direction and a position oriented more parallel to the discharge direction.

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6. An instrument as claimed in Claim 5, in which the air guiding surface (17) is curved at least in the plane in which it is pivotable.

7. An instrument as claimed in Claim 6, in which the carrier (10, 11) has a biconvex shape in a cross-section perpendicular to its pivotal axis.

8. An instrument as claimed in any one of the preceding Claims, comprising at least two of said carriers (10, 11).

9. An instrument as claimed in Claim 8, further comprising coupling means (18) which couple the carriers (10, 11) to one another so as to cause the carriers (10, 11) to be pivoted jointly.

10. An instrument as claimed in any one of the preceding Claims, in which the carrier (10, 11) is supported so as to be pivotable about a pivotal axis with respect to the housing (9) and the hair guides (12, 13, 14) which project from the carrier (10, 11) are arranged in double rows of V-shaped cross-section, which are oriented parallel to said pivotal axis.

11. An instrument as claimed in Claim 10, in which the hair guides (12, 13, 14) include coarse hair guides (12) which form a comb and fine hair guides (13, 14) which form a brush.

12. An instrument as claimed in any one of the preceding Claims, in which the housing (9) has a coupling portion (20) which is remote from the hair guides (12, 13, 14), for coupling to a hair dryer unit (1).

13. An instrument as claimed in any one of the Claims 1-11, further comprising a hair dryer unit (1) having an air inlet (5), a fan (2) and a heating element (3) for heating air (7, 7') which passes through.

14. An instrument as claimed in any one of the Claims 1-11, in which the housing also accommodates an air inlet, a fan and a heating element for heating air which passes through.

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Page 313 of 1998

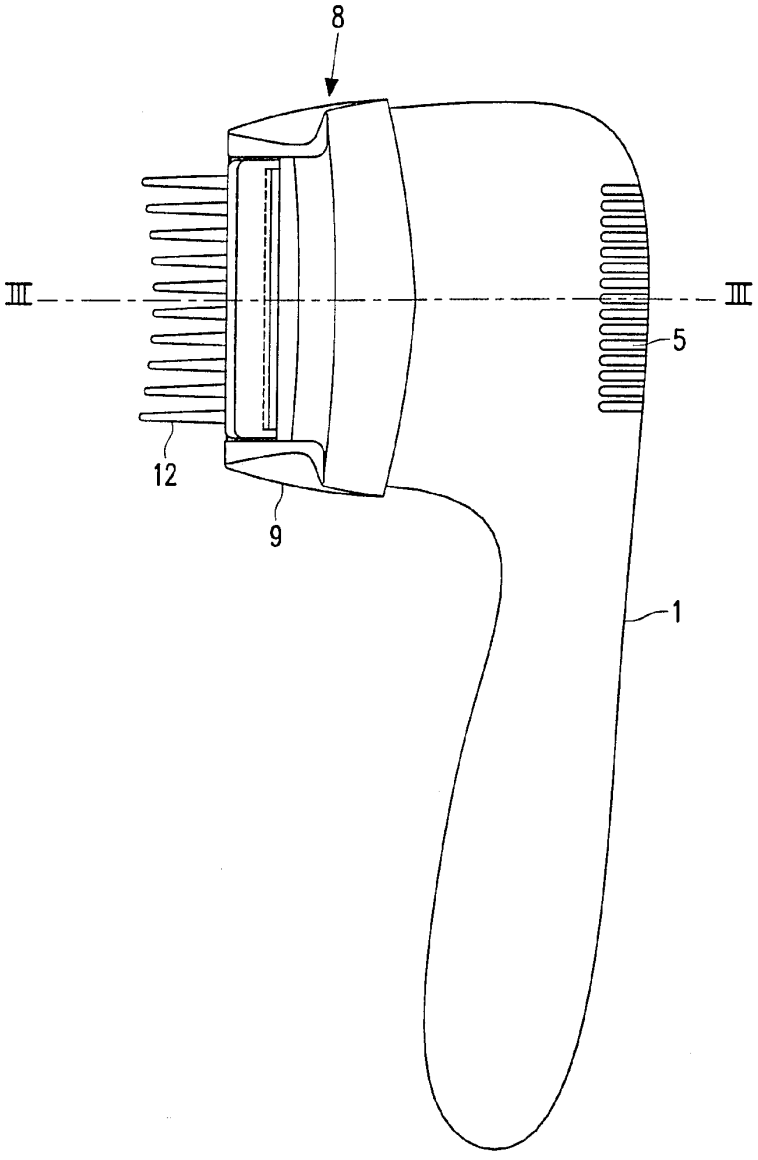


FIG. 1

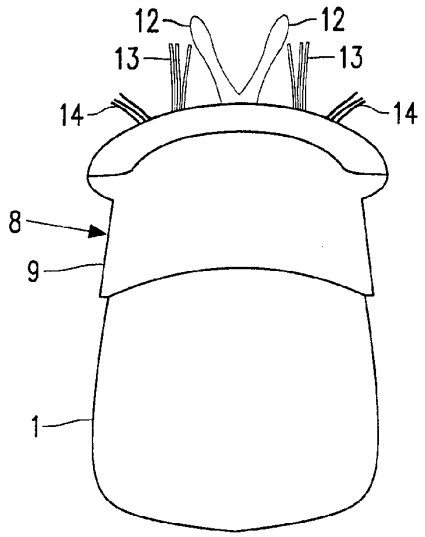

12
12
13
13
14
14
8
9
1

FIG. 2

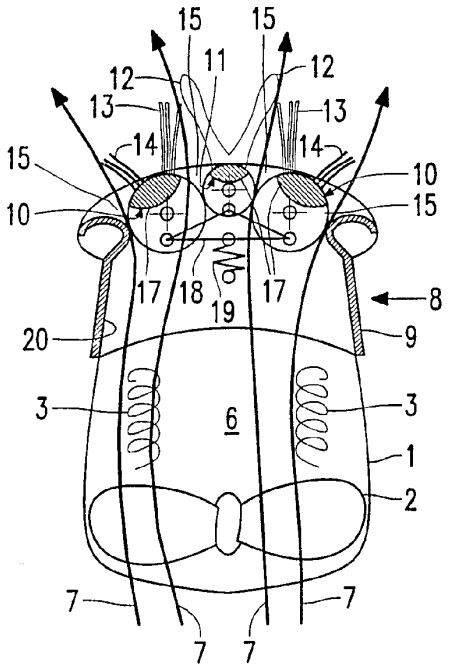

15
15
11
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10
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18
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20
9
3
6
3
1
2
7
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7
7

FIG. 3

3/3

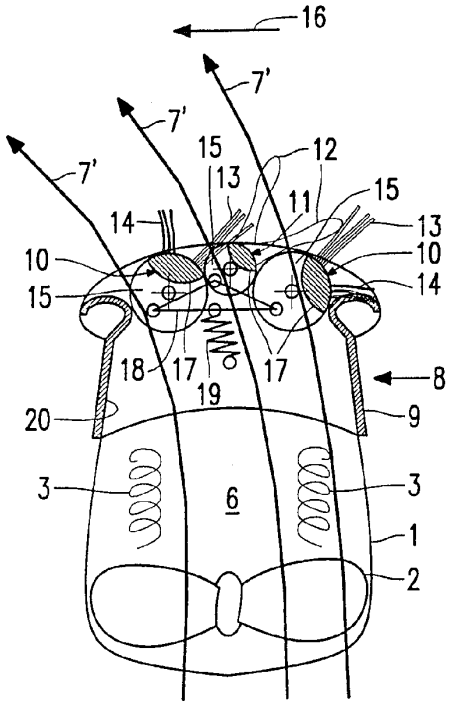

16
7'
7'
7'
15
13
12
11
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18
17
19
17
8
20
9
3
6
3
1
2

FIG. 4

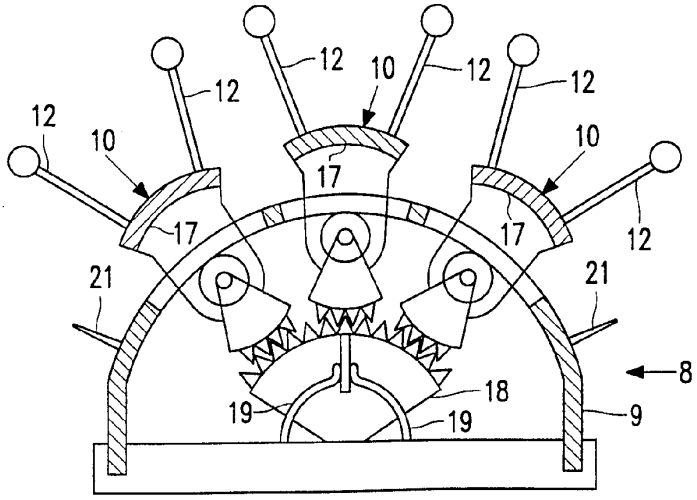

12
12
10
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17
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19
9

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 97/01537

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A45D 20/12, A45D 20/50
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A45D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5235759 A (RIZZUTO, JR.), 17 August 1993 (17.08.93), column 2, line 25 - line 29, figure 2 --	1-6,12-14
X	US 5546674 A (LANGE ET AL), 20 August 1996 (20.08.96), column 7, line 39 - line 61, figures 7A,B --	1,10-14
X	US 3981313 A (BURKE ET AL), 21 Sept 1976 (21.09.76), figures 3-4, abstract --	1-2,12-14
A	JP 62192108 A (MATSUSHITA ELECTRIC WORKS LTD), 22 August 1987 (22.08.87), figures 6-11 --	1-2

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 March 1998	30 -03- 1998
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Marianne Dickman Telephone No. +46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1992)

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Page 317 of 1998

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 97/01537

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3949765 A (VALLIS), 13 April 1976 (13.04.76), figure 5, claim 9 --	11
A	GB 2294200 A (PHILIPS ELECTRONICS N V), 24 April 1996 (24.04.96), figures 1-6, abstract --	1

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Page 318 of 1998

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/03/98

International application No.
PCT/IB 97/01537

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5235759 A	17/08/93	NONE	
US 5546674 A	20/08/96	AT 153224 T	15/06/97
		DE 4236036 A	28/04/94
		DE 59306541 D	00/00/00
		EP 0665725 A,B	09/08/95
		WO 9409669 A	11/05/94
US 3981313 A	21/09/76	CA 1062908 A	25/09/79
JP 62192108 A	22/08/87	JP 1934626 C	26/05/95
		JP 6059251 B	10/08/94
US 3949765 A	13/04/76	NONE	
GB 2294200 A	24/04/96	DE 29515923 U	07/12/95
		ES 1032244 U,Y	16/04/96
		FR 2725347 A,B	12/04/96
		GB 9520594 D	00/00/00
		IT 1276909 B	03/11/97
		IT MI952064 A	10/04/96
		JP 8182532 A	16/07/96
		SG 35019 A	01/02/97

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
MJF_WOP1314B		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GB2015/050659	6 March 2015 (06-03-2015)	20 March 2014 (20-03-2014)
Applicant		
DYSON TECHNOLOGY LIMITED		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the language, the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [X] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,
   a. the figure of the drawings to be published with the abstract is Figure No. 1a
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2015/050659

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 36
because they relate to subject matter not required to be searched by this Authority, namely:

Rules 6.2(a) and 6.3(a) PCT

2. [ ] Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2015/050659

A. CLASSIFICATION OF SUBJECT MATTER
INV. A45D20/50 A45D20/12 A4689/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A45D A46B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP S62 41606 A (MATSUSHITA ELECTRIC WORKS LTD) 23 February 1987 (1987-02-23)	1,3-9, 17, 19-25, 33-35
A	figures 3-5	10, 12-16, 26,28-32

X	US 3 981 313 A (BURKE FREDERICK A ET AL) 21 September 1976 (1976-09-21)	1,2,4-8, 17,18, 20-24, 33-35
	column 3, line 4 - column 5, line 59; figures 1-7	

	-/--	

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 April 2015	08/05/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ionescu, C

1

Form PCT/ISA/210 (second sheet) (April 2005)

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2015/050659

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/129289 A1 (HAFEMANN KLAUS [DE]) 8 July 2004 (2004-07-08) paragraphs [0010] - [0037]; figures 1-3	1,3-8, 11,17, 19-24, 27,33-35

1

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

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Page 323 of 1998

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2015/050659

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP S6241606 A	23-02-1987	NONE	
US 3981313 A	21-09-1976	CA 1062908 A1	25-09-1979
		US 3981313 A	21-09-1976
US 2004129289 A1	08-07-2004	AT 308258 T	15-11-2005
		AU 2003255185 A1	24-06-2004
		CN 2674925 Y	02-02-2005
		DE 20218783 U1	08-04-2004
		DE 50301538 D1	08-12-2005
		DK 1425986 T3	20-03-2006
		EP 1425986 A1	09-06-2004
		HK 1057965 A2	08-04-2004
		JP 4241349 B2	18-03-2009
		JP 2004181241 A	02-07-2004
		KR 20040050046 A	14-06-2004
		TW I290823 B	11-12-2007
		US 2004129289 A1	08-07-2004

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB2015/050659	06.03.2015	20.03.2014

International Patent Classification (IPC) or both national classification and IPC
INV. A45D20/50 A45D20/12 A46B9/02

Applicant
DYSON TECHNOLOGY LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Telephone No. +31 70 340-0

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 36

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 36

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	10, 12-16, 26, 28-32
	No:	Claims	1-9, 11, 17-25, 27, 33-35
Inventive step (IS)	Yes:	Claims	10, 12-16, 26, 28-32
	No:	Claims	1-9, 11, 17-25, 27, 33-35
Industrial applicability (IA)	Yes:	Claims	1-35
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

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Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claim 36 has not been searched: see Rules 6.2(a) and 6.3(a) PCT.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 JP S62 41606 A (MATSUSHITA ELECTRIC WORKS LTD) 23 February 1987 (1987-02-23)

D2 US 3 981 313 A (BURKE FREDERICK A ET AL) 21 September 1976 (1976-09-21)

D3 US 2004/129289 A1 (HAFEMANN KLAUS [DE]) 8 July 2004 (2004-07-08)

1 Novelty

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 17 is not new in the sense of Article 33(2) PCT.

1.1 D1 discloses, see figures 3-5, using the wording of claim 1 (the references in parentheses applying to this document):

An attachment (1) for a hand held appliance comprising an inlet; an outlet (implicit, see figures); and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot (see slots 15 radially disposed closest to the inlet of the attachment) extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment (see figures 4 and 5) wherein fluid emitted from the outlet is blown along the external surface and fluid emitted from the outlet flows around the external surface of the attachment.

Thus, the subject-matter of claim 1 is not new (Article 33(2) PCT).

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Page 329 of 1998

In addition, D2 and D3 also disclose the subject-matter of claim 1, see the figures and corresponding passages cited in the search report (Article 33(2) PCT).

1.2 Further, D1 also discloses, see figures 3-5, using the wording of claim 17 (the references in parentheses applying to this document):

A hand held appliance comprising a handle (5) having a fluid flow path from an inlet to an outlet and a fan unit (12) for drawing fluid into the fluid inlet and an attachment (1) for attaching to the handle, the attachment comprising an inlet; an outlet (implicit, see figures); and a fluid flow path between the inlet and the outlet, wherein the outlet comprises at least one slot (see slots 15 radially disposed closest to the inlet of the attachment) extending from near an inlet end of the attachment towards a distal end of the attachment and wherein the outlet is at least partially defined by an external surface of the attachment (see figures 4 and 5) and fluid emitted from the outlet is blown along the external surface and fluid emitted from the outlet flows around the external surface of the attachment.

Thus, the subject-matter of claim 17 is not new (Article 33(2) PCT).

In addition, D2 and D3 also disclose the subject-matter of claim 17, see the figures and corresponding passages cited in the search report (Article 33(2) PCT).

1.3 Dependent claims 2-9, 11, 18-25, 27 and 33-35 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty, see the figures and the corresponding passages cited in the search report (Article 33(2) PCT).

1.4 The combination of the features of dependent claims 10, 12-16, 26 and 28-32 is neither known from, nor rendered obvious by the available prior art.

Re Item VII

Certain defects in the international application

2 The subject-matter of claims 1 and 17 is not concise (Article 6 PCT). Although claims 1 and 17 have been drafted as separate independent claims, they appear to relate to essentially the same subject-matter and differ from each other only by the terminology used as well as by the addition and deletion of certain features.

3 Independent claims 1 and 17 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (D1) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

4 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

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Page 331 of 1998

Electronic Acknowledgement Receipt	
EFS ID:	23272850
Application Number:	14656357
International Application Number:	
Confirmation Number:	9085
Title of Invention:	ATTACHMENT FOR A HAND HELD APPLIANCE
First Named Inventor/Applicant Name:	Alasdair Michael MACLAINE
Customer Number:	25227
Filer:	Christopher Elmose Gloria/Donna Bernecker
Filer Authorized By:	Christopher Elmose Gloria
Attorney Docket Number:	424662093300
Receipt Date:	21-AUG-2015
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_424662093300.pdf	45188 b640757a3fea103cb0f6eb5274d4301b5b56f1e3	yes	3

	Multipart Description/PDF files in .zip description			
	Document Description	**Start**	**End**	
	Transmittal Letter	1	2	
	Information Disclosure Statement (IDS) Form (SB08)	3	3	
Warnings:				
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2	Foreign Reference	JP_62_41606.pdf	554711 285a4ecc3d80247af6f3ffa9250f1625f852de99	no	4
Warnings:					
Information:					
3	Foreign Reference	WO_92_14378.pdf	7019697 e499437aa034edb2ee86a7e3c9c0e4e54c2c9553	no	88
Warnings:					
Information:					
4	Foreign Reference	WO_98_27842.pdf	1966771 4ab13662b2afa584511076de437e72010394258f	no	16
Warnings:					
Information:					
5	Non Patent Literature	ISR_WO_2093300_May082015.pdf	378146 c84c4d919d3da665d0ace47f5e5800eb49fe82f7	no	12
Warnings:					
Information:					
		Total Files Size (in bytes):	9964513		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: August 21, 2015 Signature: /dbernecker/
(Donna Bernecker)

Patent
Docket No. 424662093300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 Confirmation No.: 9085

Filed: March 12, 2015 Art Unit: 3776

For: ATTACHMENT FOR A HAND HELD APPLIANCE Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & § 1.98

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Madam:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, Applicant submits for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of the foreign documents and non-patent literature are submitted herewith. The Examiner is requested to make these documents of record.

This Information Disclosure Statement is submitted within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required.

Applicant would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

va-456655

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In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. § 1.17 (p)) is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petition and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing (424662093300). However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: August 21, 2015

Respectfully submitted,

By /christopher gloria/
Christopher Gloria
Registration No.: 71,907
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
(703) 760-7389

va-456655

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/656,357	03/12/2015	Alasdair Michael MACLAINE	424662093300

CONFIRMATION NO. 9085

PUBLICATION NOTICE

25227
MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 400
MCLEAN, VA 22102

OC00000077641664

Title:ATTACHMENT FOR A HAND HELD APPLIANCE

Publication No.US-2015-0265024-A1
Publication Date:09/24/2015

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

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Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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Page 337 of 1998

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	14/656,357
				Filing Date	March 12, 2015
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	3776
(Use as many sheets as necessary)				Examiner Name	R. K. Doan
Sheet	1	of	1	Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-2015/0265022	09-24-2015	MacLaine	
	2.	US-2015/0265023	09-24-2015	MacLaine et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]

Examiner Signature		Date Considered	

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

va-469365

Electronic Acknowledgement Receipt

EFS ID:	25123620
Application Number:	14656357
International Application Number:	
Confirmation Number:	9085
Title of Invention:	ATTACHMENT FOR A HAND HELD APPLIANCE
First Named Inventor/Applicant Name:	Alasdair Michael MACLAINE
Customer Number:	25227
Filer:	Christopher Elmose Gloria/Donna Bernecker
Filer Authorized By:	Christopher Elmose Gloria
Attorney Docket Number:	424662093300
Receipt Date:	07-MAR-2016
Filing Date:	12-MAR-2015
Time Stamp:	17:05:05
Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_424662093300.pdf	43250 f12083c76caddc5a1b6eadb212b282745bd39231	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			
	Total Files Size (in bytes):	43250	

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New International Application Filed with the USPTO as a Receiving Office
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I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: March 7, 2016
Electronic Signature for Donna Bernecker: /dbernecker/

Patent
Docket No. 424662093300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 | Confirmation No.: 9085

Filed: March 12, 2015 | Art Unit: 3776

For: ATTACHMENT FOR A HAND HELD APPLIANCE | Examiner: Robyn Kieu Doan

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & § 1.98

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, Applicant submits for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. The Examiner is requested to make these documents of record.

This Information Disclosure Statement is submitted within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required.

Applicants would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

va-469364

The information contained in this Information Disclosure Statement under 37 C.F.R. § 1.97 and § 1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

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Dated: March 7, 2016

Respectfully submitted,

Electronic signature: /christopher gloria/
Christopher Gloria
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(703) 760-7389

va-469364

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	14/656,357
				Filing Date	March 12, 2015
				First Named Inventor	Alasdair Michael MACLAINE
				Art Unit	3776
(Use as many sheets as necessary)				Examiner Name	R. K. Doan
Sheet	1	of	1	Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-4,471,791	09-18-1984	DeRoche	
	2.	US-5,661,910	09-02-1997	Schepisi	
	3.	US-5,868,148	02-09-1999	Lindsey et al.	
	4.	US-2013/0111777	05-09-2013	Jeong	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	5. c	JP-57-196907	12-03-1982	Matsushita Electric Works Ltd. (Araki MASAKATSU)	Corresponds to GB 2 100 981 cited below	
	6.	GB-2 100 981	01-12-1983	Matsushita Electric Works Ltd. (Araki MASAKATSU)		
	7.	JP-64-29208	01-31-1989	Matsushita Electric Works Ltd. (Yuzo OKUDAIRA et al.)	Full Translation	x
	8.	JP-2000-516483	12-12-2000	Vital Hair Tools, LLC (Natale SCHEPISI)	Corresponds to US 5,661,910 cited above	

Examiner Signature		Date Considered	

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]

Examiner Signature		Date Considered	

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

va-478482

⑲ 日本国特許庁（JP）　　⑪ 特許出願公開

⑫ 公開特許公報（A）　　昭57—196907

⑤1Int. Cl.³　識別記号　庁内整理番号　⑬公開　昭和57年(1982)12月3日
A 45 D 1/20　7030—3B

発明の数　1
審査請求　未請求

（全 8 頁）

⑤4毛髪カール器

⑦1出　願　人　松下電工株式会社
門真市大字門真1048番地

⑦2発　明　者　荒木雅克
門真市大字門真1048番地松下電工株式会社内

⑦4代　理　人　弁理士　石田長七

⑳特　願　昭56—82958
㉒出　願　昭56(1981)5月30日

明　細　書

1. 発明の名称

毛髪カール器

2. 特許請求の範囲

(1) 加熱して毛髪をカールする毛髪カール器において、ブリスル台とブリスルをシリコンゴムで一体形成して成ることを特徴とする毛髪カール器。

(2) 内筒に平板状のブリスル台を巻付けるとともにブリスル台を係止具にて固定して成ることを特徴とする特許請求の範囲第1項記載の毛髪カール器。

(3) 係止具をアルミニウムのような熱伝導性の高い金属にて形成して成ることを特徴とする特許請求の範囲第2項記載の毛髪カール器。

(4) ばね性を有する帯状の芯材を円周方向に離間して複数片配設し、各芯材に帯状のブリスル台を夫々固着して成ることを特徴とする特許請求の範囲第1項記載の毛髪カール器。

3. 発明の詳細な説明

本発明は毛髪カール器に関するものである。

従来の毛髪カール器(1)にあつては、ブリスル(2)が硬質で腰み性に欠けていたので、毛髪を巻き付けて巻き戻す際、毛髪がからみ付いて外れないという問題があつた。即ち、第1図のように巻き付いた毛髪束(A)から飛び出す部分のブリスル(2)が、巻き戻し時の回転によりその下にある毛髪束(B)の中の毛髪(Bb)を引掛けてからみ付くのである。この現象は毛髪(A)がもつれている時に頻繁に起こる。また他の従来例として第2図のように硬質プラスチックで構成されたブリスル(2)′をブリスル台(1)′に取付けるのにブリスル(2)′の根元部を押えつけるようにコーム材(3)で全周を囲み込むように構成したいわゆるクッションブラシというのがあつたが、これもブリスル(2)′のたわみ性に関し次の問題があつた。

①カール付け時に毛髪を巻き付けるとゴムの台が毛髪でしばり付けられるような形となり、その後のブリスルのたわみ易さは低下することとなり、からみ付き防止という点で完全な効果を出し

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得なかつた。

②このようなクッションブラシの構成は列毎にブリスルをゴム台に通す操作が必要であり、組立性が悪かつた。

本発明は上記の点に鑑みてなされたものであつて、その目的とするところは、巻き戻し回転時に、ブリスルが毛髪を引掛けた場合、その毛髪がブリスルから確実に逃げれる毛髪カール器を提供するにある。

以下、本発明を図示の実施例に基づいて詳述する。第3図および第4図は本発明の第1実施例を示してある。ブリスル台(1)とブリスル(2)とはシリコンゴムにて一体成形されてあり、ブリスル台(1)は円筒状に形成されてある。そしてブリスル台(1)を硬質の内筒(4)に被せてロッド(3)が形成されてある。このように構成されるロッド(3)は第26図(a)(b)のように熱風発生機本体(6)やヘアアイロン本体(7)等の本体(5)に取付けられるものである。またロッド(3)を第26図(c)のように握り棒(8)に取付け、予め加熱器でロッド(3)を加熱してから毛髪に巻き付けるようにしてもよい。図中(9)はヒータ、(10)はモータ、(11)はファン、(12)はスイッチ、(13)は吸気口、(14)は熱風噴出孔、(15)はキャップである。第26図(b)のようにヘアアイロン型としてロッド(3)を用いる場合にはロッド(3)内にヒータが内装されるのである。更に第23図のように毛髪押え板(16)を有するカールパイプ(17)を先部に取着した熱風発生機本体(6a)とロッド(3)とを組み合わせ、ロッド(3)を熱風発生機本体(6a)に着脱自在にすることにより、アイロン的な使い方とロールブラシ的な使い方の両方ができるようになる。

次にシリコンゴム材料に限定した理由について述べる。現在考えられるソフト材料としてはポリエステル系、ポリオレフィン系等の熱可塑性エラストマーと加硫ゴムの2種が考えられるが、

①熱可塑性エラストマーに関しては、実使用耐久性評価の結果、短期間のうちに永久変形(曲げ)を生じ使いものにならないことがわかつた。

②シリコンゴムはその点全く永久変形を起さず、曲げ耐久性の良いことも確認できた。

そしてシリコンゴムをブリスルの材料として用いた場合の具体的な長所として下記の点がある。即ち、

(イ)曲げ回復性の良いブリスルを得ることができ、耐久性を保証できる。(後述の実験結果)

(ロ)ドライヤー、アイロン等の高温で使用する場合、シリコンゴムは熱的に安定しており、熱的な耐久性が保証できる。

(ハ)ゴム材で構成するため毛髪との摩擦力を大きくすることができ、巻き部の回転に毛髪が追従し易くなるため、巻き付け易いブリスルとすることができる。

(ニ)毛髪はブラッシング時に加わる機械力で傷める場合が多いが、シリコンゴムで構成したブリスルは毛髪表面硬度よりも硬度が低く、又、ブラッシング時もつれがあるとブリスルそのものが低荷重でたわみ、逃げてくれることにより毛髪に無理な力が加わらず、傷みを防止する効果もある。

(ホ)シリコンゴムであれば毛髪のからみ付きを防止するのに充分な軟かさ、たわみ易さを持つブリスルを構成することができる。

(ヘ)シリコンゴムは表面硬度が低く、そのため第6図の比較例で示すようにコーミング時、毛髪(20)表面へのなじみが良く、たとえば、皮脂を毛髪全体にゆきわたらせる効果が高い。

(ホ)でいう"からみ付きを防止するのに充分なたわみ易さ"とは、ブリスルを第5図のようにブリスル台から突出する片持ちばりと考え、撓み易さをそのばね定数K〔1㎜のたわみに必要な荷重(g/㎜)〕であらわしたときの実験結果からいえるものである。即ち、K=6~20g/㎜とすればブリスルが絡んでからみ付き防止に大きな効果があり、又コーミング性(毛流れの整え易さ)のうえから問題のないことが判明する。

第7図および第8図は本発明の第2実施例を示してある。ブリスル台(1)は平板状に形成されて

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あり、ブリスル台(1)の両端縁にはコ字状の引掛け部(8)が設けられてある。硬質の内筒(4)には軸方向全長に亘つて係止用のスリット孔(9)が形成されてあり、このスリット孔(9)の孔縁に引掛け部(8)を係止してブリスル台(1)を内筒(4)に巻設してある。このようにブリスル台(1)およびブリスル(2)を平板状に一体成形したから、その成形が容易となる。熱風噴出孔(10)は内筒(4)およびブリスル台(1)を貫設して形成してある。またブリスル台(1)の係止具を兼ねる内筒(4)はアルミニウムのような熱伝導性の高い金属にて形成すれば、内筒(4)内にヒータ(9)を備えることにより、毛髪の巻付部に均一に熱が伝わりカール効果が向上する。

第9図および第10図は本発明の第3実施例を示してある。平板状のブリスル台(1)の両端縁には係止突条(21)が形成されてあり、このブリスル台(1)を内筒(4)に巻いて断面コ字状の係止具(22)にて係止突条(21)を嵌着してある。

第11図は本発明の第4実施例を示してある。ブリスル台(1)およびブリスル(2)を平板状に一体成形したものを内筒(4)に巻き付けてある。ブリスル台(1)の外周には円周方向に一定間隔で且つ内筒(4)の軸方向に亘つて導条(23)が複数条凹設されてある。各導条(23)にはアルミニウム等の熱伝導性の高い帯状金属板(24)を嵌め込んであり、その両端はキャップ(15)と本体(5)のケーシング(16)で止めてある。熱風噴出孔(14)は帯状金属板(24)、ブリスル台(1)および内筒(4)に亘つて貫設されてある。したがつて表面に露出する帯状金属板(24)により毛髪への熱伝導が良好となり、カール効果が向上する。

第12図および第13図は本発明の第5実施例を示してある。アルミニウム等の熱伝導性の高い金属にて形成した外筒(26)の内周面にブリスル台(1)を一体成形し、外筒(26)の突出孔(27)からブリスル台(1)を一体成形されてブリスル(2)を突設してある。また突出孔(27)の孔径D_2とブリスル(2)の根元部の径D_1との関係は$D_1 < D_2$に設定してある。シリコンの弱点が引き裂きに弱く、その表面に多少でも傷が入ると極度に折れ易くなるためである。仮りに$D_1 = D_2$の関係を実施し、ブリスル(2)の根元部に外筒(26)の突出孔(27)縁部が接触すると、ブリスル(2)が折れてしまうこととなる。このような観点から$D_1 < D_2$に設定してある。しかして外筒(26)に毛髪が直に触れることにより毛髪のカール効果が向上する。

第14図乃至第16図は本発明の第6実施例を示してある。アルミニウム等の熱伝導性の良好な金属板(28)の裏面にブリスル台(1)を一体形成し、金属板(28)の突出孔(27)からブリスル台(1)と一体形成されたブリスル(2)を突出してある。そしてブリスル台(1)および金属板(28)を係止用のスリット孔(9)を有する内筒(4)に巻き付け、スリット孔(9)の孔縁に金属板(28)の係止片(29)を折曲して引掛けてある。突出孔(27)の孔径D_2とブリスル(2)の根元部の径D_1との関係は上記理由により、$D_1 < D_2$に設定してある。

第17図乃至第20図は本発明の第7実施例を示してある。複数の帯状のブリスル台片(30)を円周方向に一定間隔に配設してブリスル台(1)を構成してある。ばね性に富む細帯状の芯材(31)にブリスル片(32)を形成してある。このブリスル片(32)を円周方向に複数枚配設し、ブリスル片(32)の両端をキャップ(15)と本体(5)のケーシング(16)とで保持されてあり、ブリスル片(32)間の隙間を熱風噴出口(14)としてある。しかしてブリスル片(32)がばね性により、毛髪を巻き付けると撓むとともに、巻き付けた毛髪の内部からテンションが毛髪に加わり、毛髪の巻きぐせ効果が向上する。ブリスル片(32)の両端に突出する芯材(31)はキャップ(15)およびケーシング(16)の溝(34)に嵌め込まれてある。ロッド(17)はキャップ(15)の支持軸(33)の端部をケーシング(16)にねじ止めすることにより支持されてある。(34)は熱風口である。

第21図および第22図は本発明の第8実施例を示してある。芯材(31)を有しないブリスル台片(30)の両側には係止片(37)が突出してあり、ブリスル台片(30)を円周方向に複数枚配設してブリスル台(1)を形成してある。髪巻き筒(36)の外周には導条(38)が凹設されてあり、この導条(38)にブリスル台片(30)が嵌め込まれてある。

第23図乃至第25図は本発明の第9実施例を示してある。ブリスル台(1)を細帯状に形成してあり、このブリスル台(1)を硬質の髪巻き筒(39)にら

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せん状に巻き付けてある。

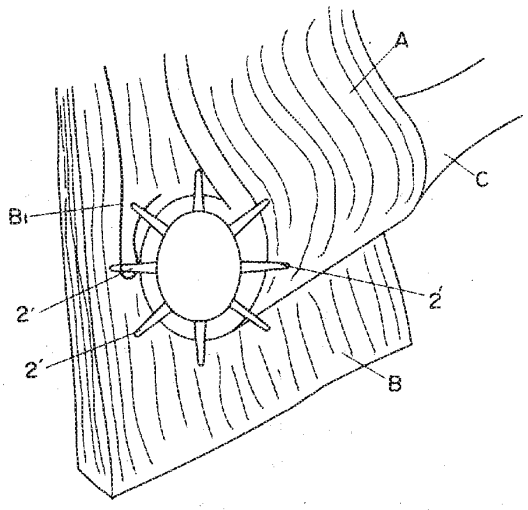
本発明は叙述のように、ブリスル台とブリスルをシリコンゴムで一体形成したので、シリコンゴムの軟かさと撓み易さがブリスルに付与され、したがつて毛髪の巻き戻し回転時に、ブリスルが毛髪を引掛けてもブリスルは撓みにより逃げることができ、この結果毛髪に無理な力が加わらず毛髪の傷みを防止できるという利点がある。しかもシリコンゴムは耐熱性を有するので毛髪の加熱にも耐えることができるという利点がある。

4. 図面の簡単な説明

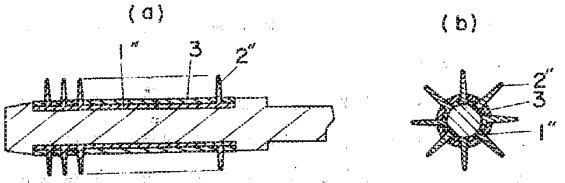
第1図は従来例の使用状態図、第2図(a)(b)は他の従来例の正断面図および側断面図、第3図は本発明の第1実施例の正断面図、第4図は同上のロッドの斜視図、第5図および第6図(a)(b)は同上のブリスルの特性を示す説明図、第7図は本発明の第2実施例の分解斜視図、第8図は同上のブリスル台の斜視図、第9図は本発明の第3実施例の分解斜視図、第10図は同上のブリスル台の斜視図、第11図は本発明の第4実施例の分解斜視図、第12図は本発明の第5実施例の分解斜視図、第13図は第12図のX－X拡大断面図、第14図は本発明の第6実施例の分解斜視図、第15図は同上の金属板にブリスル台を一体形成したものの斜視図、第16図は第15図のY－Y断面図、第17図は本発明の第7実施例の斜視図、第18図は同上の側断面図、第19図は同上の正断面図、第20図は同上のブリスル片の拡大斜視図、第21図は本発明の第8実施例の分解斜視図、第22図は同上のブリスル台片の斜視図、第23図は本発明の第9実施例の斜視図、第24図は同上のブリスル台の取付け説明図、第25図は同上のブリスル台の部分斜視図、第26図(a)(b)(c)および第27図は本発明のロッドを各種の本体に取付ける状態を示す斜視図であつて、(1)はブリスル台、(2)はブリスルである。

代理人　弁理士　石田長七

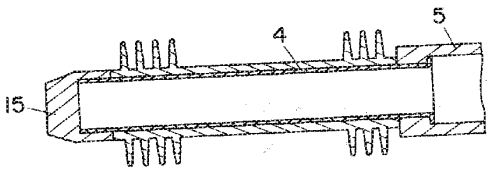
第1図



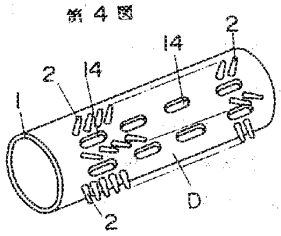
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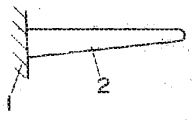
第3図



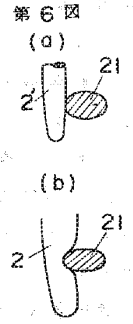
第4図



第5図

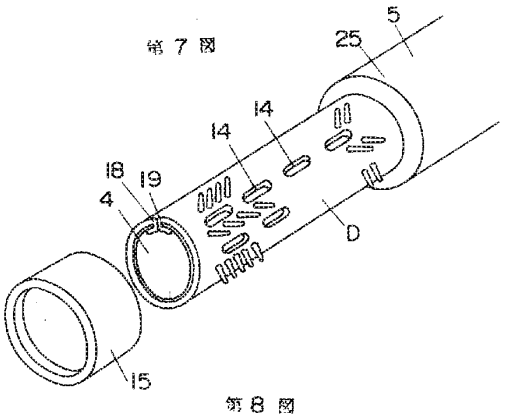


第6図

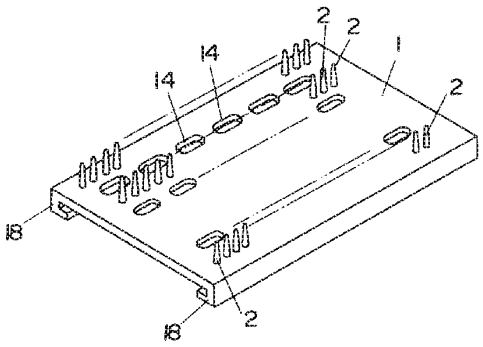


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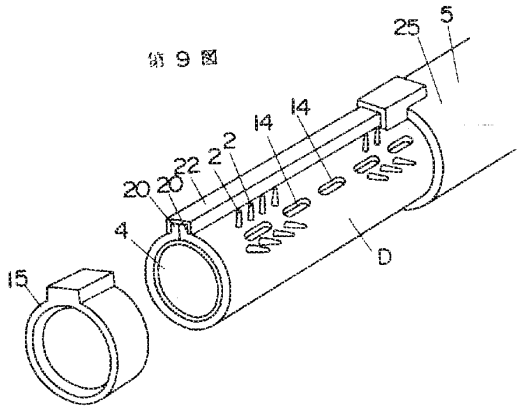
第7図



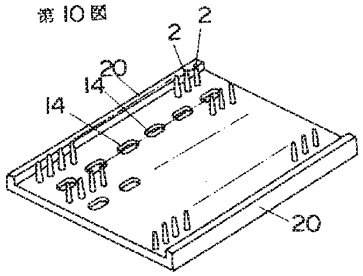
第8図



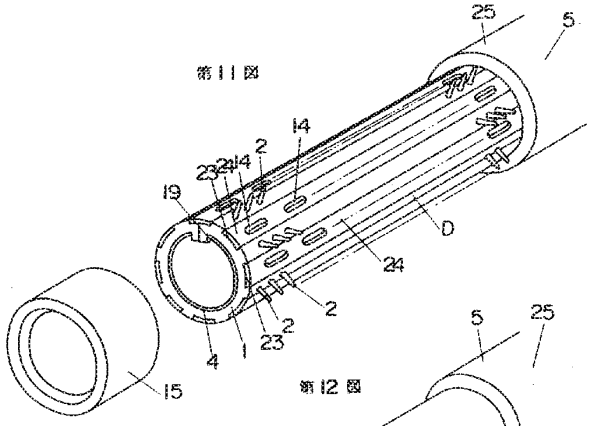
第9図



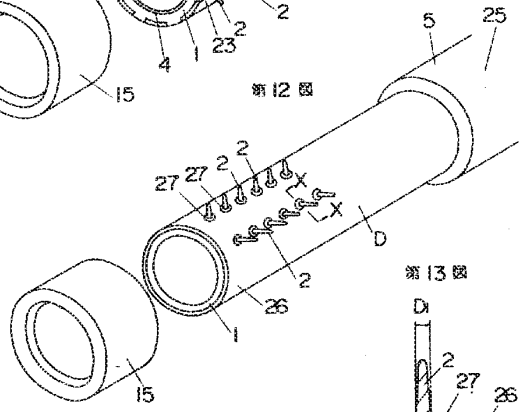
第10図



第11図



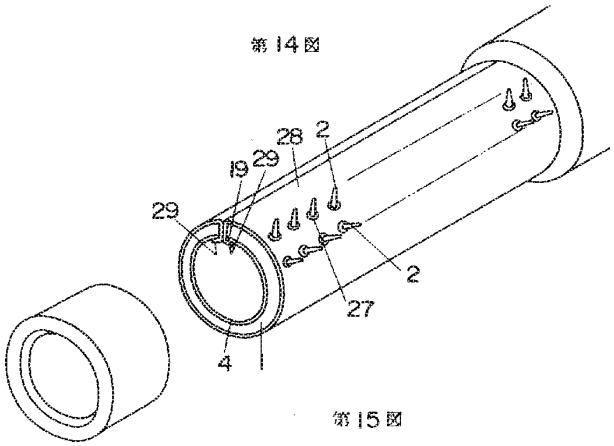
第12図



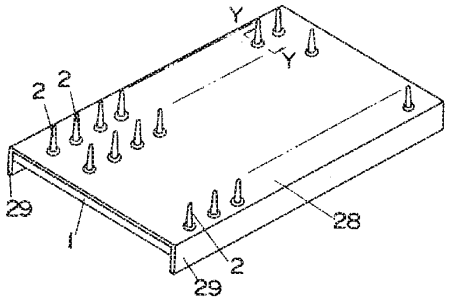
第13図

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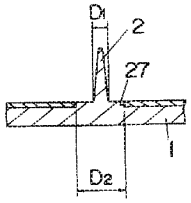
第14図



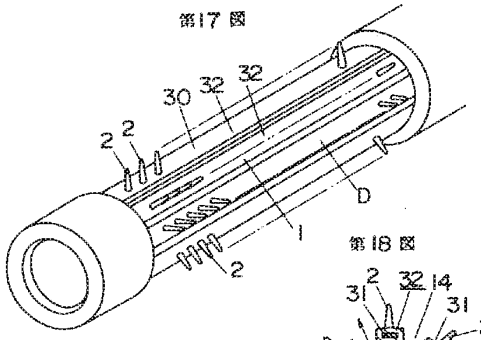
第15図



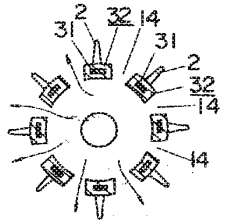
第16図



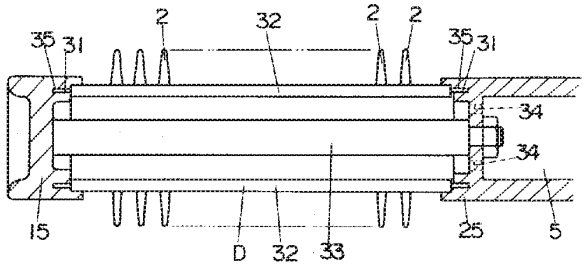
第17図



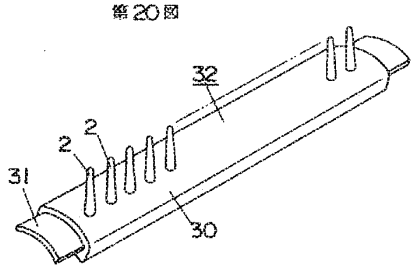
第18図



第19図

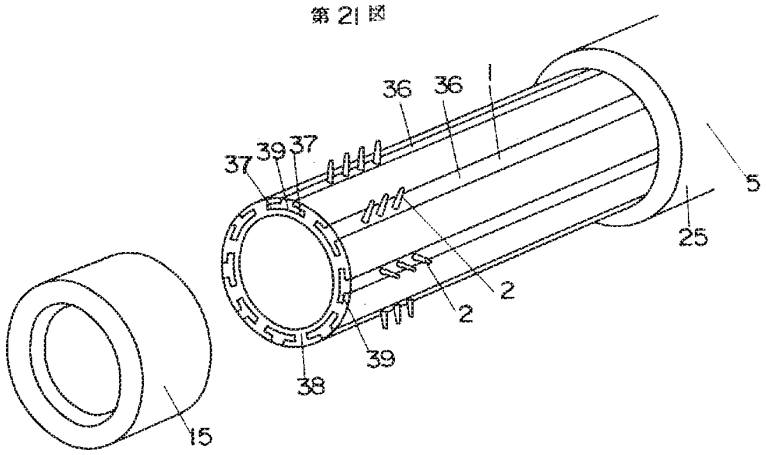


第20図

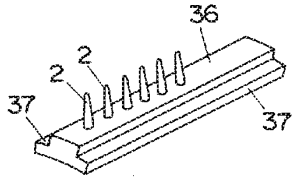


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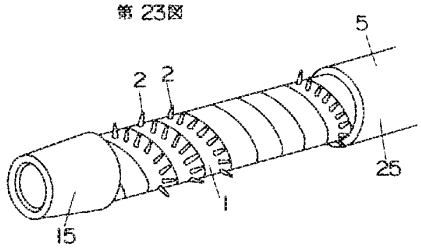
第21図



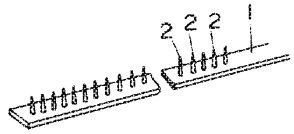
第22図



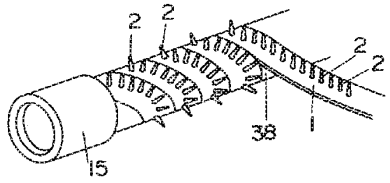
第23図



第25図

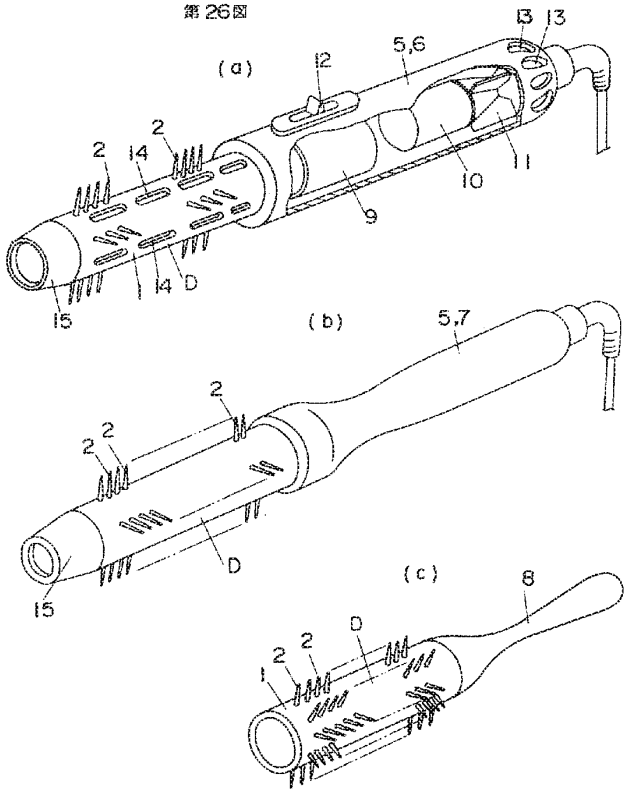


第24図

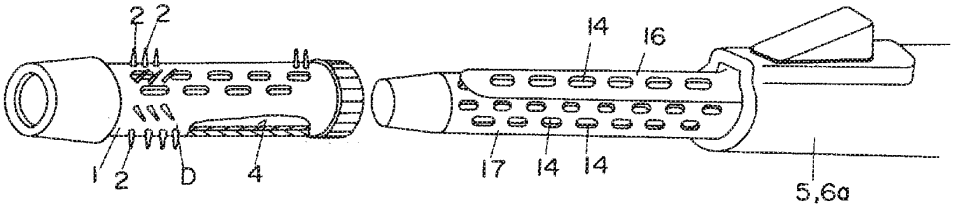


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第26図



第27図



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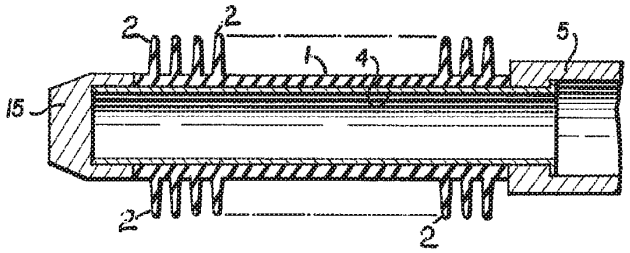
(12) UK Patent Application (19) GB (11) 2 100 981 A

(21) Application No 8215758
(22) Date of filing 28 May 1982
(30) Priority data
(31) 56/082958
(32) 30 May 1981
(33) Japan (JP)
(43) Application published
12 Jan 1983
(51) INT CL³
A45D 2/42 2/36 6/00
(52) Domestic classification
A4V 14A3 14A4 14A5X
(56) Documents cited
None
(58) Field of search
A4K
A4V
(71) Applicants
Matsushita Electric Works Ltd. (Japan),
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(74) Agents
Gill Jennings and Every,
53/64 Chancery Lane,
London WC2A 1HN

(54) Hair curler

(57) A hair curler comprises a main body 5 and a hair winding portion consisting of an internal cylinder 4 of aluminium surrounded by a sleeve-like bristle mounting platform with bristles 2 which are integrally fabricated from silicone rubber, the open end being closed by a cap 15. Owing to the use of silicone rubber, hair is easily disentangled without damage and in addition the curler will not deteriorate or deform under high temperature operating conditions.

FIG. 3



GB 2 100 981 A

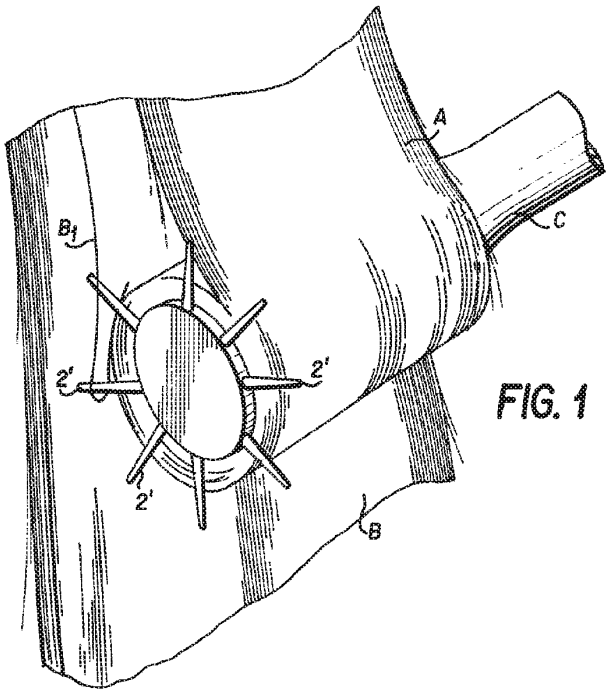


FIG. 1

FIG. 2A

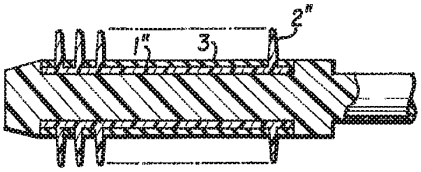


FIG. 2B

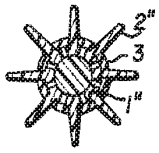


FIG. 3

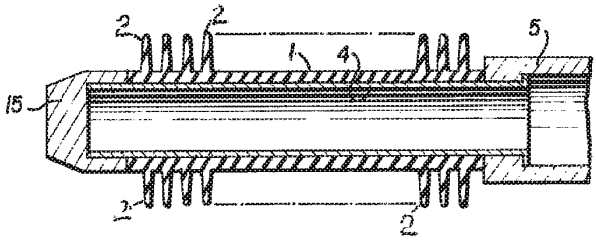
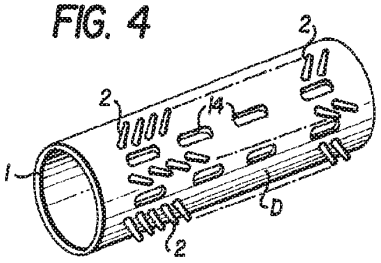


FIG. 4



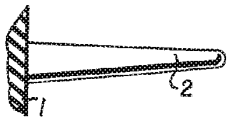


FIG. 5

FIG. 6A

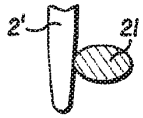


FIG. 6B

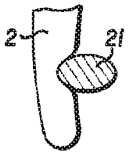


FIG. 7

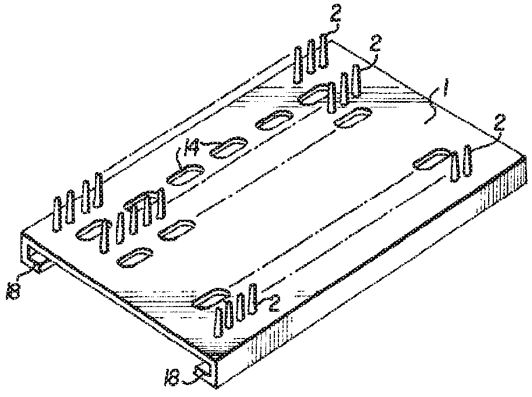


FIG. 8

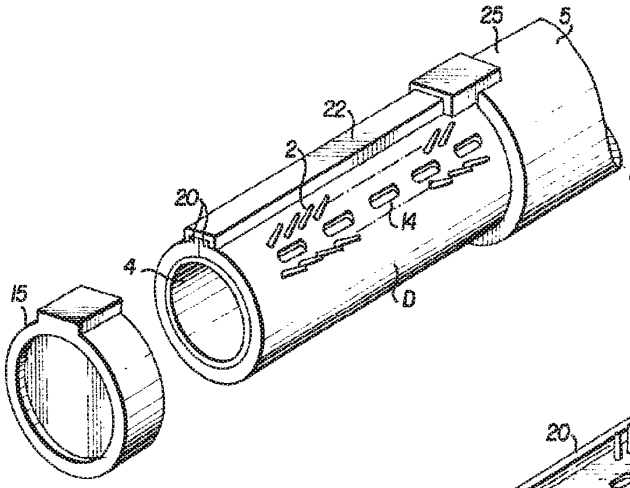


FIG. 9

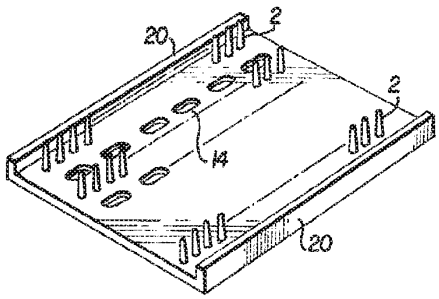


FIG. 10

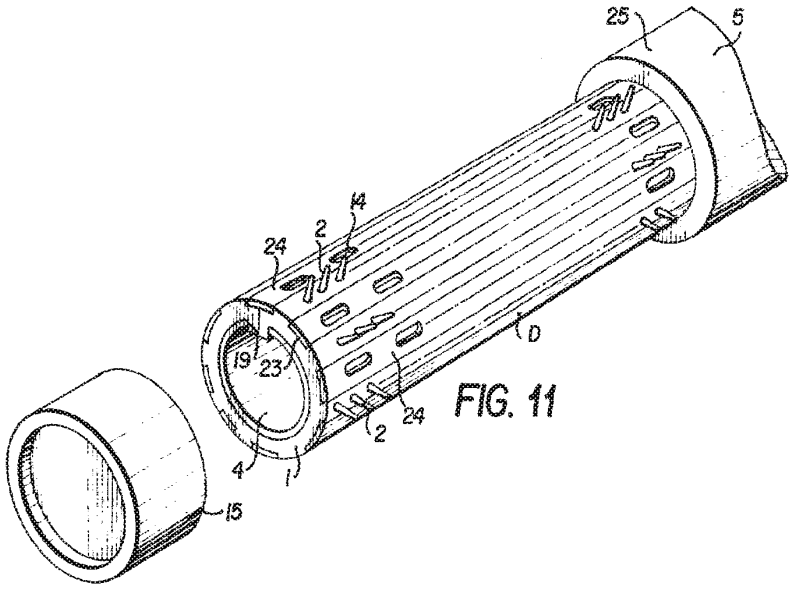


FIG. 11

FIG. 12

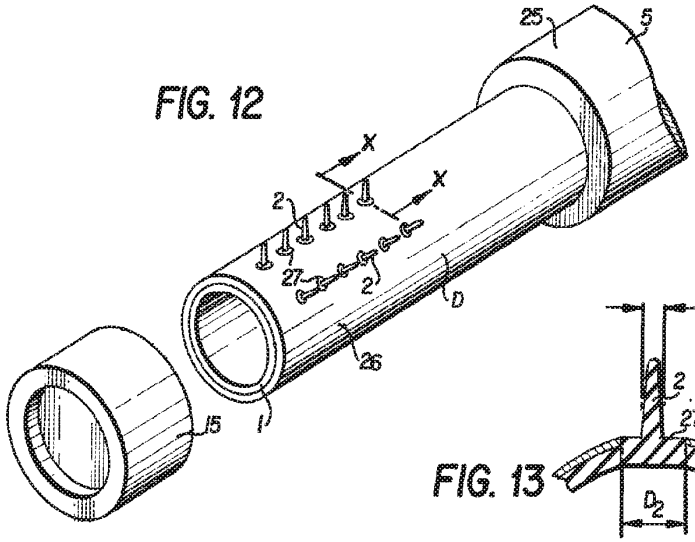


FIG. 13

FIG. 14

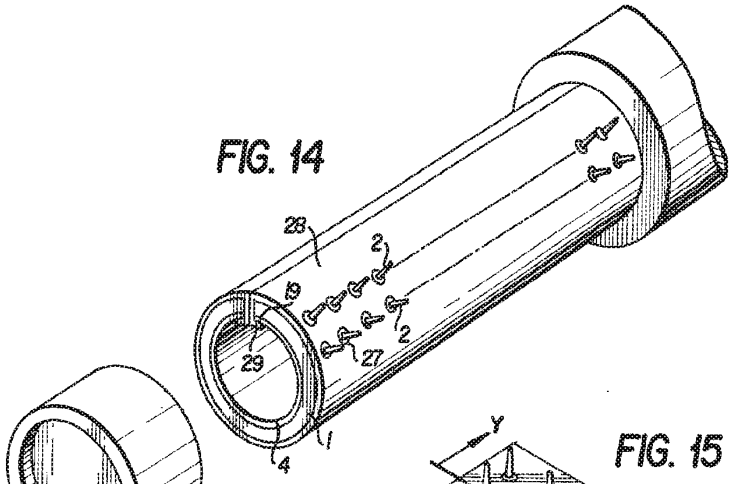


FIG. 15

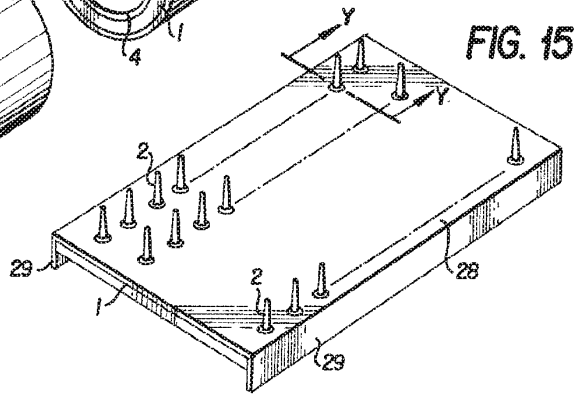


FIG. 16

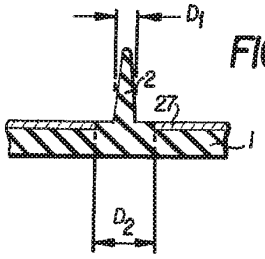


FIG. 17

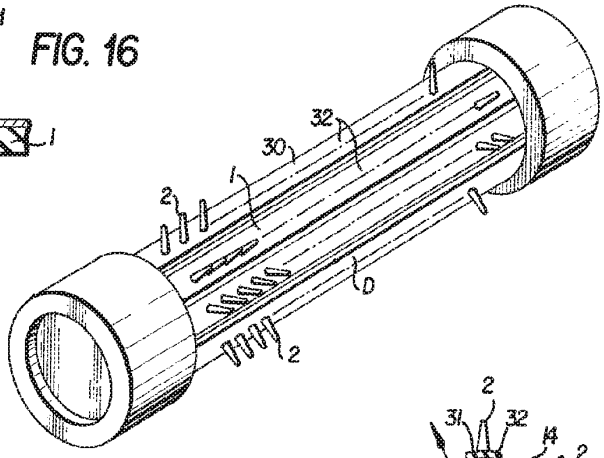


FIG. 18

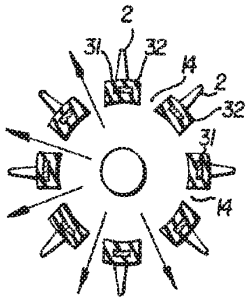


FIG. 19

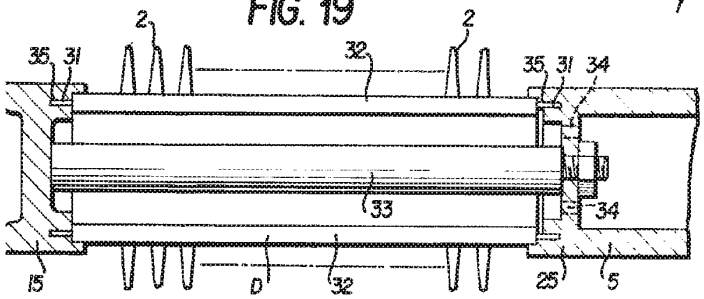
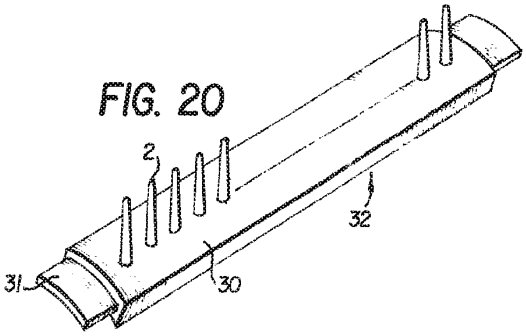


FIG. 20



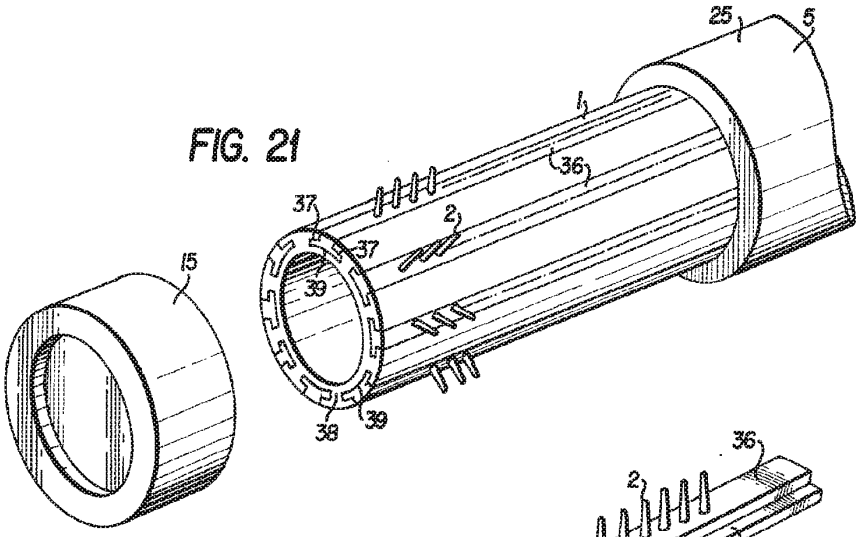


FIG. 21

FIG. 22

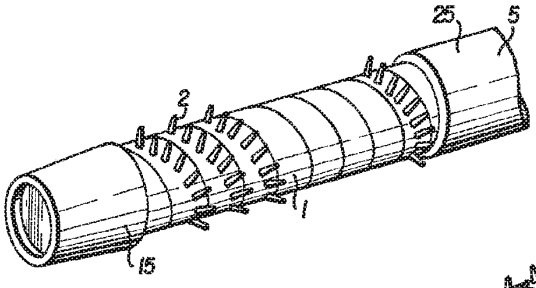


FIG. 23

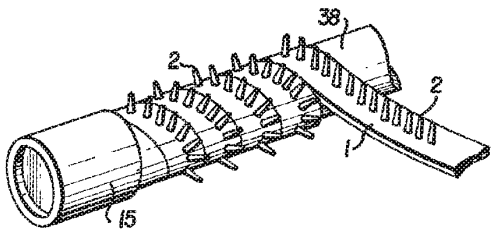


FIG. 24

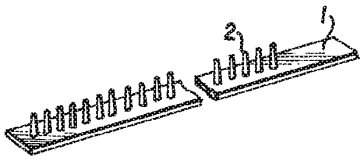


FIG. 25

FIG. 26A

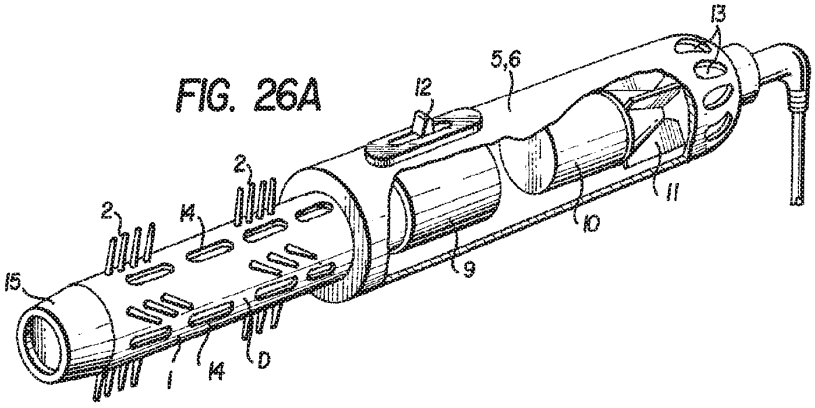


FIG. 26B

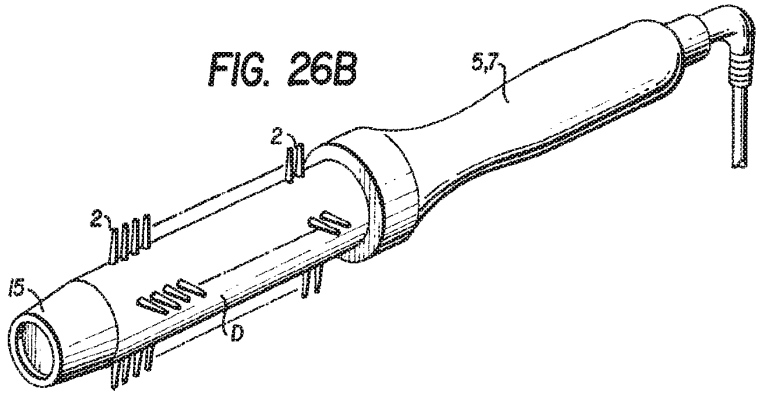
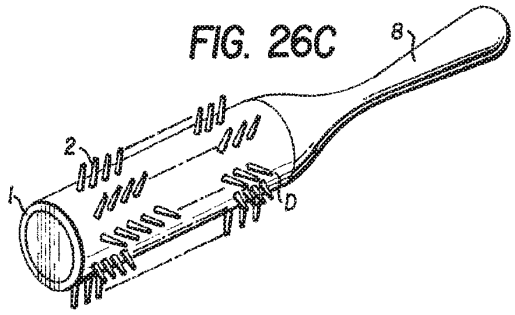


FIG. 26C



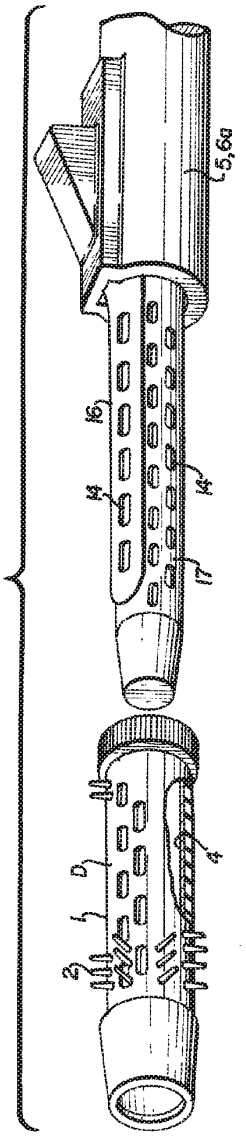


FIG. 27

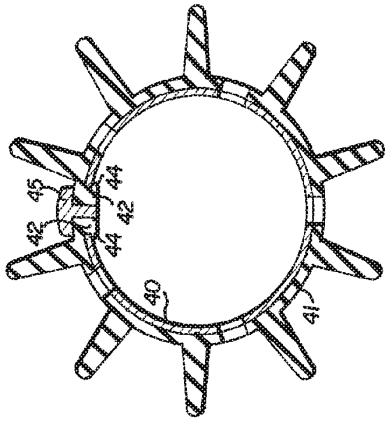


FIG. 29

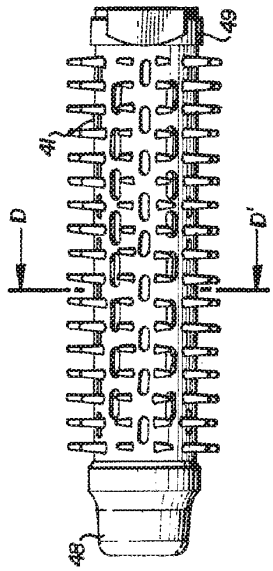
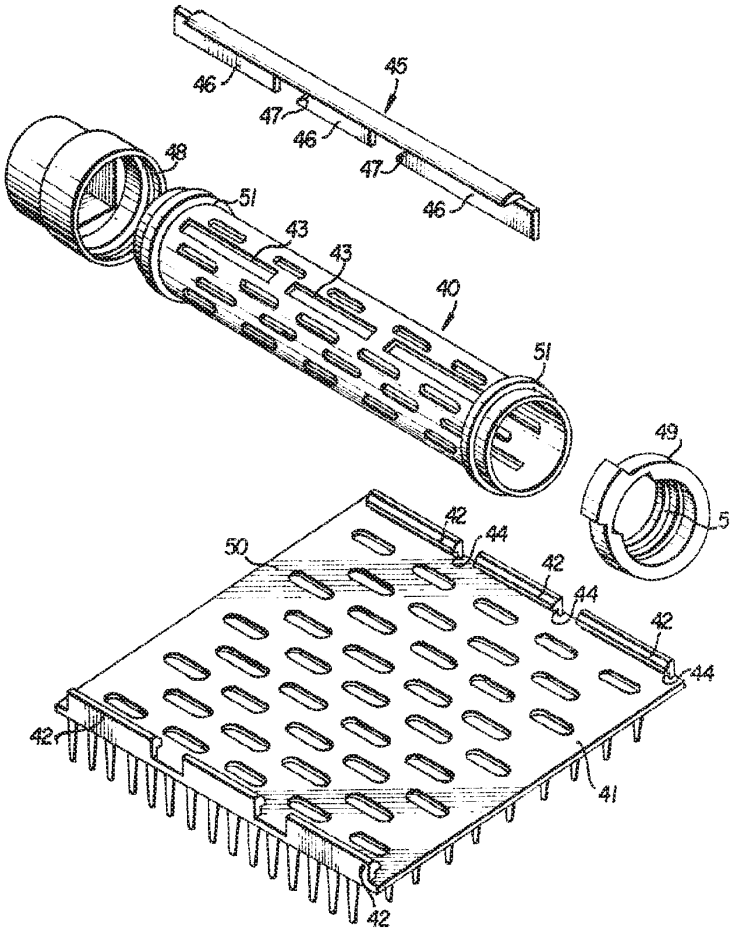


FIG. 28

FIG. 30



SPECIFICATION

Hair curler

This invention relates to hair curlers and related appliances, particularly electric hair curlers and appliances of the hand-held type.

Electric hair curlers and appliances of the hand-held type are generally known, but have several disadvantages. For example, in many conventional hair curlers and appliances, hair is wound around a cylindrical hair-winding portion or attachment which has bristles disposed along its length. These bristles are quite hard and lack any significant flexibility. Thus, hair wound on the portion or attachment becomes entangled in these bristles and is very difficult to disentangle. This disadvantage displays itself in several ways. For example, a bundle of hair may be wound around the hair-winding portion or attachment in such a way that the bristles protrude beyond the wound hair and become entangled in another bundle of hair located beneath the first bundle. This kind of entanglement is often associated with entanglement of the wound hair with the bristles.

The "cushion brush" type of hair curler or appliance, known in the art, attempts to overcome these disadvantages by mounting its hard bristles on a flexible rubber bristle-mounting platform and restricting the movement of the bristles by enveloping the bristle-mounting platform with a harder layer through which the bristles project. However, it suffers from the disadvantage of hair binding by the rubber bristle-mounting platform which reduces the movement of the bristles so much that entanglement occurs. Further, assembly of the "cushion brush" hair curler or appliance is complicated.

It is therefore an object of the present invention to provide a hair curler or appliance having a hair-winding member in the form of an attachment or portion which will permit hair to become disentangled from its hair-winding bristles easily and surely, and which is easy to manufacture and assemble.

The inventive principle which is common to all the different embodiments about to be described is the use of integral bristles of silicone rubber. Although many of the properties of this material are well known it also has unsuspected secondary properties which make it particularly suitable for this specific purpose.

The main properties leading to the selection of silicone rubber are as follows:—

(a) Bristles of silicone rubber have excellent resilient and recover from bending easily. As a result, such bristles have great durability also.

(b) Silicone rubber is stable at the high operating temperatures of hair appliances which employ heating such as hair curlers, hair irons and the like. Thus, bristles and bristle-mounting platforms of silicone rubber have great thermal endurance. Further, silicone rubber does not suffer permanent deformation (bending) due to heating during operation of such appliances and it is thus superior to thermoplastic elastomers in this respect.

(c) A larger friction force can be obtained between silicone rubber and hair. Thus, hair easily follows the rotation of the hair winding attachment of the hair appliance and bristles can wind hair easily;

(d) Although hair is frequently hurt by mechanical forces in brushes, bristles made of silicone rubber have a hardness lower than that of hair surfaces and are bent by a relatively low force if the hair is entangled when brushing. Thus, hair does not suffer an excessive force during brushing and damage to hair is prevented.

(e) Silicone rubber bristles have sufficient softness and flexibility to prevent entanglement of hair. Sufficient flexibility to prevent the entanglement of hair is defined as the spring constant K [load required for flexure of 1 mm (g/mm)] as calculated for a cantilever projecting beyond a bristle-mounting platform (as described later). That is to say, when K is 6 to 20 g/mm, entanglement of hair can effectively be prevented and excellent combing attained.

(f) Silicone rubber has low surface hardness and bristles made of it adapt easily to the surface of the hair when combing and have a marked effect of spreading sebaceous oil from the skin all over the hair.

Examples of construction in accordance with the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of a conventional hair curler as employed in curling hair;

Figures 2(a) and 2(b) are respectively, a longitudinal and a cross section of the hair winding portion of a second type of conventional hair curler;

Figure 3 is a longitudinal section of the hair winding portion of a first embodiment of a hair curler according to the invention;

Figure 4 is a perspective view of the bristle mounting platform of the hair curler shown in Figure 3;

Figure 5 is a detail view of a bristle of the hair curler shown in Figure 3;

Figures 6(a) and 6(b) are sectional views showing the special characteristics of the bristle shown in Figure 5;

Figure 7 is an exploded perspective view showing the hair winding portion of a second embodiment of a hair curler according to the invention;

Figure 8 is a perspective view of the bristle mounting platform of the hair curler shown in Figure 7 prior to its incorporation therein;

Figure 9 is an exploded perspective view of the hair winding portion of a third embodiment of a hair curler according to the invention;

Figure 10 is a perspective view of the bristle mounting platform of the hair curler shown in Figure 9 prior to its incorporation therein;

Figure 11 is an exploded perspective view showing the hair winding portion of a fourth embodiment of a hair curler according to the invention;

The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

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Figure 12 is an exploded perspective view showing the hair winding portion of a fifth embodiment of a hair curler according to the invention;

Figure 13 is a detail, in cross section of the hair curler of Figure 12 taken along line X–X thereof;

Figure 14 is an exploded perspective view of the hair winding portion of a sixth embodiment of a hair curler according to the invention;

Figure 15 is a perspective view of the bristle mounting platform of the hair curler of Figure 14 prior to its incorporation therein;

Figure 16 is a detail, in cross section, of the platform of Figure 15 taken along line Y–Y thereof;

Figure 17 is a perspective view showing the hair winding portion of a seventh embodiment of a hair curler according to the invention;

Figure 18 is a cross sectional view of the hair curler of Figure 17;

Figure 19 is a longitudinal sectional view of the hair curler of Figure 17;

Figure 20 is a perspective view of one of the bristle mounting strips of the hair curler of Figure 17;

Figure 21 is an exploded perspective view showing the hair winding portion of an eighth embodiment of a hair curler according to the invention;

Figure 22 is a perspective view of one of the bristle mounting strips of the hair curler of Figure 21.

Figure 23 is a perspective view showing the hair winding portion of a ninth embodiment of a hair curler according to the invention;

Figure 24 is a perspective view showing the mode of incorporation of the bristle mounting platform of the hair curler of Figure 23;

Figure 25 is a partial perspective view of the bristle mounting platform of the hair curler of Figure 23;

Figures 26(a), 26(b), 26(c) and 27 are perspective views showing the hair winding portion of a hair curler according to the invention on a variety of main bodies;

Figure 28 is a front view of the hair winding portion of a tenth embodiment of a hair curler according to the invention;

Figure 29 is a cross sectional view of the hair curler of Figure 28, taken along the line D – D'; and

Figure 30 is an exploded perspective view of the hair curler of Figure 28 showing the bristle mounting platform in its configuration prior to incorporation therein.

Referring first to Figure 1, this illustrates a conventional hair curler C as actually employed in curling hair. The hair curler C is equipped with a hair-winding portion having bristles 2'. A bundle of hair A is shown being wound around the hair-winding portion of the hair curler C. As mentioned, because the bristles 2' are hard and lack flexibility, the hair in bundle A is likely to become entangled and cannot be disentangled except with great difficulty and possible harm to the hair. In addition, if bristles 2' project through wound hair bundle A they may also entangle hair from other bundles, such as hair B_1, of hair bundle B. Indeed, the two kinds of entangling are often associated with one another.

Referring now to Figs. 2(a) and 2(b), these illustrate a second type of conventional hair curler, known as a "cushion brush", which attempts to overcome the disadvantages of the hair curler illustrated in Figure 1. In this "cushion brush" hair curler, the hard bristles 2" are mounted on a flexible rubber bristle-mounting platform 1". To control the movement of the bristles an envelope 3 of harder material surrounds the flexible rubber bristle-mounting platform 1". The bristles 2" project through the envelope 3, but since the root portions of the bristles 2" are surrounded by envelope 3, their free movement is restricted. However, the "cushion brush" hair curler has the disadvantage that the flexible rubber bristle-mounting platform can bind hair wound on the hair curler, resulting in the bristles being so restricted in their movement that entanglement occurs. In addition, the "cushion brush" hair curler is quite complicated in manufacture and assembly.

Figs. 3 and 4 show a first embodiment according to the invention. A hair-winding portion of attachment for a hair curler or related hair appliance is comprised of a hollow rod assembly D detachably fixed at one of its ends to the main body 5 of the hair curler or related appliance (which may include means for heating or blowing hot air) and a cap 15 which caps hollow rod assembly D at its other end. Rod assembly D is comprised of an internal cylinder 4 surrounded by a cylindrical bristle-mounting platform 1 from which project bristles 2. Bristle-mounting platform 1 and bristles 2 are integrally fabricated from silicone rubber; the internal cylinder 4 is of relatively hard material. For example internal cylinder 4 may be made of highly thermal conductive metal such as aluminum. Both bristle-mounting platform 1 and internal cylinder 4 may include corresponding hot air outlets 14 for blowing out hot air.

The hair-winding portion or attachment including rod assembly D may be incorporated in a great variety of hair appliances. Fig. 26(a), shows the hair-winding portion or attachment attached to the main body 5 of a hair appliance for blowing hot air 6. In operation, ambient air is drawn in through air inlets 13 by fan 11 which is driven by motor 10 and heated as it passes heater 9. These components are arranged in main body 5 and controlled by electrical switch 12 in the usual manner. The heated air in the blower out through the hot air outlets of the hair-winding portion or attachment.

Fig. 26(b) shows the hair-winding portion or attachment attached to main body 5 of a hair iron 7 provided with a heater therein. Alternatively, the hair-winding attachment or portion assembly may be mounted on a handle 8 to form a hair iron which is heated by an external heater prior to being used on the hair. It will be noted that since neither hair iron in Figs. 26(b) or 26(c) employs blowing hot air through the hair-winding attachment or portion, the hot air outlets 14 are unnecessary and have been eliminated. In addition, as shown in Fig. 27, incorporation of the hair-winding attachment or portion in a combination hair iron and roll-brush is possible if the main body 5 of hot air blowing hair appliance 6a is provided with a curling tube 17 and an associated movable hair gripping plate 16. The hair-winding attachment or portion may be detachably mounted

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on the main body 5 of the hot air blowing hair appliance 6a over curling tube 17 and gripping plate 16 to effect the combination.

Figs. 7 and 8 show a second embodiment of the present invention. Silicone rubber bristle-mounting platform 1 is formed in a flat plate shape as shown in Fig. 8 with silicone rubber bristles 2 extending from its top surface, and has a pair of parallel fastening channels 18 extending from opposing edges of its bottom surface. The hard internal cylinder 4 is provided with a slit 19 extending over its length. The bristle-mounting platform 1 is mounted around internal cylinder 4 by engaging fastening channels 18 with the edges of internal cylinder 4 which define slit 19 to form rod assembly D. One end of rod assembly D is capped by cap 15 and the other end is secured by casing 25 of main body 5 of the hair appliance. The bristle-mounting platform 1 with its hot air outlets 14 and bristles 2 can be easily fabricated integrally in the flat plate shape. If internal cylinder 4 is made of a highly thermal conductive metal such as aluminum, heat is uniformly spread all over the wound hair, improving the curling effect.

Figs. 9 and 10 show a third embodiment of the present invention. Silicone rubber bristle-mounting element 1 is formed in a flat plate shape with silicone rubber bristles 2 extending from its top surface. A pair of parallel flanges 20 extends from opposing edges of the top surface of bristle-mounting platform 1 as well. When bristle-mounting platform 1 is mounted around hollow internal cylinder 4, the pair of flanges 20 meet to form a ridge along the length of cylinder 4 and are engaged and retained within channel-shaped fastener 22. So mounted, bristle-mounting platform 1 and internal cylinder 4 form rod assembly D. One end of rod assembly D is capped by cap 15 and the other end is secured by casing 25 of main body 5 of the hair appliance.

Fig. 11 shows a fourth embodiment of the present invention. A silicone rubber bristle-mounting platform 1 with silicone rubber bristles 2 is formed in flat plate shape similar to those described above and is mounted around a similar internal cylinder 4 to form rod assembly D. The top (external) surface of bristle-mounting platform 1 is provided with a plurality of grooves 23 along its length at fixed spaces from one another. Highly thermal conductive metal strips 24 such as strips of aluminum are inserted in said grooves 23. The strips may be held in place by having their ends retained by cap 15 (which caps one end of rod assembly D) and casing 25 of main body 5 (to which the other end of rod assembly D is attached). Hot air outlets 14 corresponding to those of bristle-mounting platform 1 (and internal cylinder 4) may be disposed along the thermal conductive metal strips 24. The highly thermal conductive metal bands 24 lead to better thermal conductance and thereby improve curling.

Figs. 12 and 13 show a fifth embodiment of the present invention. Silicone rubber bristle-mounting platform 1 is mounted integrally on the internal surface of a cylinder 26 (the latter being made of highly thermal conductive metal such as aluminum and the like) to form rod assembly D. One end of rod assembly D is capped by cap 15 and the other end is secured to casing 25 of main body 5 of the hair appliance. Silicone rubber bristles 2, which are integral with bristle-mounting platform 1, project beyond projection holes 27 of said external cylinder 26. The diameter of said projection holes 27, D_2, and the diameter of the root portions of said bristles 2, D_1, have the relation of $D_1 < D_2$ because silicone rubber tears easily. If $D_1 = D_2$, that is to say if the edges of said projection holes 27 of said external cylinder 26 come in contact with said bristles 2, the bristles 2 would be likely to break. The direct contact of hair with said external cylinder 26 can improve the curling of hair.

Figs. 14 to 16 show a sixth embodiment of the present invention. Silicone rubber bristle-mounting platform 1 with silicone rubber bristles 2 extending from its top surface, is manufactured in flat plate form, and mounted integrally on the bottom surface of a flexible plate 28 made of a highly thermal conductive metal such as aluminum. Bristles 2 extend through projection holes 27 of metal plate 28. A pair of parallel flanges 29 extends from opposing edges of the bottom surface of flexible metal plate 28. Bristles 2 are integral with bristle-mounting platform 1 and project beyond projection holes 27 of metal plate 28. Bristle-mounting platform 1 and flexible metal plate 28 are mounted around an internal cylinder 4 provided with a lengthwise slit 19 by bending flanges 29 of metal plate 28 around the edges of internal cylinder 4 which define slit 19. This forms rod assembly D which is capped by a cap at one end, the other end being attached to the main body of the hair appliance. The diameter of projection holes 27 D_2 and the diameter of the root portions of said bristles 2 D_1 are such that $D_1 < D_2$ for the above-mentioned reason.

Figs. 17 to 20 show a seventh embodiment of the present invention. Bristle-mounting platform 1 is constructed from a plurality of bristle-mounting strips 30 spaced from one another about a cylindrical axis at fixed intervals to form rod assembly D. One end of rod assembly D is capped by a cap and the other end is secured to casing 25 of the main body 5 of the hair appliance. Each bristle-mounting strip 30 comprises a silicone rubber bristle element strip 32 with an internal core strip 31 of springy materials. Silicone rubber bristles 2 are integral with and extend from each bristle element strip 32. The ends of said bristle-mounting strips 30 are retained by cap 15 and casing 25 of main body 5 of a hair appliance. The gaps between bristle-mounting strips 30 serve as hot air outlets 14. The ends of core strips 31 project beyond the ends of their respective bristle element strips 32 and are inserted into grooves 35 of cap 15 and casing 25. A supporting axle 33 extends from cap 15 and is secured to casing 25 by screw. Outlets 34 in casing 25 permit hot air to be conveyed from main body 5 to the interior of rod assembly D. Bristle-mounting strips 30 are springy and flex when hair is wound round the hair curler. Hair is placed under tension from the inside of the wound hair and thereby curling can be improved.

Figs. 21 and 22 show an eighth embodiment of the present invention. Hair-winding cylinder 38 is provided with grooves 39 on its external surface. The

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grooves 39 are spaced from one another and extend in the axial direction of cylinder 38. Each groove has the cross-section of an inverted T. A silicone rubber bristle-mounting strip 36 is inserted in each groove to form a rod assembly. One end of the rod assembly is capped by cap 15 and the other end is secured to casing 25 of main body 5 of the hair appliance. Each strip 36 has the cross-section of an inverted T complementary to its respective groove 39 and includes a pair of parallel fastener flanges 37 which extend along its sides at its lower surface and silicone rubber bristles 2 which extend from its upper surface. The strips 36 are further retained by casing 25 of main body 5 and cap 15.

Figs. 23 to 25 show a ninth embodiment of the present invention. A silicone rubber bristle-mounting element 1 from which extend silicone rubber bristles 2 is formed in a flexible narrow band. Said bristle-mounting element 1 is wound spirally around relatively hard hair-winding cylinder 38 to form a rod assembly. Casing 25 of main body 5 and cap 15 fit over the bristle-mounting element 1 at the ends of cylinder 38 to retain it thereon.

Figs. 28 to 30 show a tenth embodiment of the present invention. A silicone rubber bristle-mounting platform 41 is formed in a flat plate shape with silicone rubber bristles extending from its top surface. Two opposing edges of platform 41 form a pair of parallel flanges 50. A series of three hook fasteners 42 are provided along each of the other two opposing edges along the bottom surface of platform 41 so that there are three pairs of opposing hook fasteners 42. The hook portions 44 of the hook fasteners 42 of each opposing pair face each other. The bristle-mounting platform 41 is mounted around a cylinder 40 to form a rod assembly. Cylinder 40 has a series of three colinear hook insertion slits 43 extending axially along its length, there being one hook insertion slit 43 for each pair of opposing hook fasteners 42. At each end of cylinder 40 is a lip 51. Platform 41 is mounted around cylinder by inserting each pair of opposing hook fasteners 42 in its respective insertion slit 43. On insertion, the hook portions 44 of each hook fastener 42 of each pair engage with the respective edge portions of cylinder 40 which defines their respective insertion slit 43. In addition, an insert fastener 45 is employed which has three colinear insert tabs 46 corresponding to the insertion slits 43. At least some of the insert tabs having locking notches 47 at one of their ends. Each tab 46 is inserted in its respective insertion slit 43 between the two members of the hook fastener pair already inserted and engaged. The insert fastener 45 is then moved axially to engage the fastening notches 47 of the insert tabs 46 with cylinder 40 on which platform 41 has been placed. A front cap 48 and rear cap 49 are then placed over the ends of cylinder 40. Caps 48 and 49 have fitting grooves 53 and fit over lips 51 to secure flanges 50 of platform 41 to cylinder 40.

CLAIMS

1. A hair winding member for a hair appliance having a main body, the hair winding member extending from the main body and comprising a hollow rod assembly comprising a hollow cylinder enveloped by a cylindrical bristle mounting platform made of silicone rubber and having integral bristles also made of silicone rubber extending outwardly from it, and a cap mounted on the end of the hollow rod assembly remote from the main body.

2. A hair winding member according to claim 1 wherein the hollow cylinder is made of a highly thermal conductive metal.

3. A hair winding member according to claim 2 wherein the highly thermal conductive metal is aluminium.

4. A hair winding member according to any one of the preceding claims wherein the hollow cylinder and the platform include corresponding hot air outlets.

5. A hair winding member according to any one of the preceding claims wherein, prior to incorporation into the hollow rod assembly, the platform is in flat plate form and includes means for fastening it around the hollow cylinder.

6. A hair winding member according to claim 5 wherein the fastening means comprises a pair of opposing parallel fastening channels extending from opposing edges of the surface of the platform which is opposite to the surface from which the bristles extend and wherein the hollow cylinder is provided with a slit along its length into which the pair of fastening channels may be inserted to engage the edges of the hollow cylinder which define the slit.

7. A hair winding member according to claim 5 wherein the fastening means comprises a pair of parallel flanges extending from opposing edges of the same surface of the platform from which the bristles extend, the pair of flanges meeting to form a ridge along the length of the cylinder when the platform is mounted around said cylinder and a channel-shaped fastener receiving and engaging the ridge.

8. A hair winding member according to any one of claims 5 to 7 wherein the platform is provided with lengthwise grooves spaced from one another on the same surface of the platform from which the bristles extend and highly thermal conductive metal strips inserted in the grooves.

9. A hair winding member according to claim 8 wherein the highly thermal conductive metal is aluminium.

10. A hair winding member according to claim 8 or claim 9 wherein the metal strips have hot air outlets.

11. A hair winding member according to claim 5 wherein the platform in flat plate form prior to incorporation into the hollow rod assembly is mounted on the bottom surface of a highly thermal conductive perforated metal plate which is flexible and has a pair of opposed parallel metal flanges extending from opposing edges of its bottom surface, the bristles passing through the perforations and having a diameter which is less than that of the perforations, the hollow cylinder being provided with a slit along its length into which the pair of flanges may be inserted and bent to engage the edges of the hollow cylinder which define the slit.

12. A hair winding member for a hair appliance having a main body, the hair winding member extending from the main body and comprising a hol-

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low rod assembly comprising a hollow cylinder having perforations and enveloping a cylindrical bristle mounting platform made of silicone rubber and having integral bristles also made of silicone rubber and extending outwardly from the platform and through the perforations in the hollow cylinder, the diameter of the bristles being less than the diameter of the perforations and a cap mounted on the end of the hollow rod assembly remote from the main body.

13. A hair winding member for a hair appliance having a main body, the hair winding member extending from the main body and comprising a hollow rod assembly comprising a plurality of spaced bristle mounting strips axially disposed about a cylindrical axis, each strip comprising a bristle element strip made of silicone rubber and having integral bristles also made of silicone rubber extending away from the cylindrical axis, and a flexible core strip disposed within the bristle element strip along its entire length with the ends of the core strip extending beyond the ends of the respective bristle element strip, and a cap mounted on the end of the hollow rod assembly remote from the main body, both the cap and the main body having grooves to receive and secure the ends of the core strips of the bristle mounting strips which extend beyond their respective bristle element strips.

14. A hair winding member for a hair appliance having a main body, the hair winding member extending from the main body and comprising a hollow rod assembly comprising a hollow cylinder provided with lengthwise grooves spaced from one another around its circumference and having the cross section of an inverted T with silicone rubber bristle mounting strips of similar section inserted in the strips having integral silicone rubber bristles extending outwardly and a cap mounted on the end of the hollow rod assembly remote from the main body.

15. A hair winding member according to claim 1 in which the cylindrical bristle mounting platform is in the form of a strip which is helically wound around the hollow cylinder.

16. A hair winding member according to claim 5 wherein the fastening means includes three opposing parallel pairs of hook fasteners extending from one of the pairs of opposing edges of the surface of the platform opposite the surface from which the bristles extend, the hook portions of each hook fastener of each hook fastener pair facing each other, the platform having opposing parallel flanges extending from its other pair of opposing edges, the hollow cylinder having three co-linear fastener insertion holes, each receiving and engaging one of the pairs of hook fasteners, an insert fastener with three co-linear insert tabs, each received in one of the insertion holes between the hook fasteners of each engaged hook fastener pair, at least one of the insert tabs at one of its ends having a lock notch capable of engaging one end of its respective insertion hole, the hollow cylinder having a lip near each of its two ends and a pair of caps, each fitted over one of the lips after the platform is mounted to retain the platform on the cylinder.

17. A hair winding member according to any one of the preceding claims in the form of an attachment capable of being detachably mounted on the main body of a hair appliance.

18. A hair appliance comprising a main body and a hair winding member according to any one of claims 1 to 16.

19. A hair winding member or a hair appliance substantially as described and as illustrated with references to Figures 3 to 6, Figures 7 and 8, Figures 9 and 10, Figure 11, Figures 12 and 13, Figures 14 to 16, Figures 17 to 20, Figures 21 and 22, Figures 23 to 25 or Figures 28 to 30 of the accompanying drawings.

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(54)HAIR DRIER

(57)Abstract

PURPOSE: To lessen the occurrence of a noise without lowering air volume by attaching a noise eliminating sheet at least to a part of the inner surface of an air passage in a housing.

CONSTITUTION: At least a part of the internal surface of a housing 1 containing a motor, a fan 3, a heater or the like is lined with a noise eliminating sheet 9 formed out of two stacked layers of viscoelastic material, nonwoven fabric, filter paper and a porous material such as felt, so as to keep the viscoelastic material layer exposed to the flow passage of air. According to this construction, the occurrence of a noise can be lessened without lowering air volume.

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CLAIMS

[Claim 1]

A sound deadening sheet which laminated material and porous materials, such as a nonwoven fabric, a filter paper, and felt, which have viscoelasticity on two-layer a motor, a fan, a heater, etc. -- ****** -- having had -- a drier lining so that a material layer which has viscoelasticity in part even if there are not few inner surfaces of a housing may become an aisle side of air.

[Claim 2]

Claims stretching a sound deadening sheet to a bell mouth which is arranged on a flow path from a suction opening formed in one place of a housing to a fan, and narrows down airstream -- a drier of a description in the 1st item.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[Field of the Invention]

The present invention relates to the drier which reduced noise, such as a rotational sound of a motor, and a whizzing sound of a fan.

[Background of the Invention]

As it passes generally and seven dryers are shown in Fig. 6, in the housing I in the air, Arrange the current plate 4 which rectifies the airstream accelerated by the fan 3 rotated by the motor 2 which is a driving source, and the motor 2, and the fan 3, the heater 5 which is heat sources, etc., and it is constituted, After heating the air introduced by rotation of the fan 3 in the housing 1 from the suction opening 6 provided at one place of the housing I with the heater 5, it discharges as a hot wind from discharge Roa who provided in the other place of the housing 1. Demand that a drier secures small size and lightweight and predetermined air capacity is demanded as basic performance.

In order to fill such a demand, it is possible to raise fan 30 rotational speed and to increase air capacity.

However, the problem that noise increases arises as the rotational speed of the fan 3 become high. In order to avoid such a problem, efforts to secure predetermined air capacity with a low rotational frequency by improving the characteristic of the motor 2 and the form of the fan 3 are made, but it has not come to obtain a satisfactory result.

[Objects of the Invention]

the present invention -- **** -- a point -- taking an example -- accomplishing -- having -- the -- a purpose -- a housing -- an air passage -- an inner surface -- at least -- a part -- a sound deadening sheet -- stretching -- things -- air capacity -- it is deteriorated -- making -- without -- noise -- generating -- decreasing -- having made -- a drier -- providing -- things -- it is -- [-- invention -- disclosure --]

The low noise drier concerning the present invention so that the material layer which has viscoelasticity in part even if there are not few inner surfaces of the housing of a dryer about the sound deadening sheet which laminated the material which has viscoelasticity, and a porous material on two-layer may become an aisle side of air by lining soot ******, It muffles, while spreading the noise which occurred from the fan or the motor to housing outside, and the generated noise of a drier is reduced.

Hereinafter, the present invention is described based on Drawings. The

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conventional case of the sound deadening sheet 9 is shown in Fig. 3 and Fig. 4. The sound deadening sheets 9 shown in Fig. 3 are the sheet and nonwoven fabrics which consists of a viscoelastic material, such as vinyl rubber which forms the material layer 10 which has viscoelasticity. Adhesion lamination of See 1-11 which consists of porous materials, such as a filter paper and felt, is carried out with adhesives, The material layer 10 which hardens it after the sound deadening sheet 9 shown in Fig. 4 applies the rubber dissolved in the surface of the sheet 11 which consists of a porous material, and has viscoelasticity is formed, The material layer 10 which has viscoelasticity is in a part of surface of the sheet 11 which consists of a porous material, and is crowded, and there is a sound deadening effect so that all may be described below.

Namely, when the sound wave spreads the surface top of the material layer 10 which has the viscoelasticity of the sound deadening sheet 9 as shown in Fig. 3 or Fig. 4, As shown in Fig. 5, the material layer IO which has viscoelasticity will vibrate by a sound wave, the energy of a sound wave will be consumed as a hysteresis river inside the material which has viscoelasticity, and a sound wave will decline. Since it is supported by the sheet 11 which consists of a porous material, vibration of the material layer 10 which has viscoelasticity is supported with a pneumatic spring, and is performed efficiently.

Since the noise which it **, and the main noise sources in a drier are the driving source barrel motor 2 and the fan 3 for air blasting generally, and occurred from the noise source leaks mainly from the admission port 6 and discharge Roa, Noise is reduced by stretching the sound deadening sheet 9 to the passage of the air which is channels of communication of the noise in the housing 1. Since the material layer 10 which has viscoelasticity with the smooth surface faces the air passage, the resistance to a flow is small, and also since, as for the thickness of the sound deadening sheet 9, 2 - less than avns usually use a thin thing, the deterioration of the air capacity by stretching the sound deadening sheet 9 of the sound deadening sheet 9 is small.

(Working example 1)

It is attachment so that the material iio in which the sound deadening sheet 9 has viscoelasticity between the suction openings 6 of an end may become an aisle side of air from the fan 3 of the inner surface of the housing 1 currently formed in straight pipe shape in the dryer shown in Fig. 1. 7 is a discharge port of the other end. The noise which it **(ed) and occurred from the fan 3 is reduced with the sound deadening sheet 9, while spreading to the suction opening 6. The noise of

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the whole dryer becomes small as a result.

(Working example 2)

It is the working example which stuck the sound deadening sheet 9 inside the bell mouth 8 which is arranged at the suction opening 6 and forms the passage of air in the dryer shown in Fig. 2 so that material layer IO which has viscoelasticity might become at the aisle side of air.

The noise which occurred from the fan 3 is reduced with the sound deadening sheet 9, while spreading to the suction opening 6 through the inside of the bell mouth 8, and the noise of the whole dryer becomes small.

[Effect of the Invention]

The drier of the present invention has the advantage that noise can be reduced by that of lining sushi ****** to at least a part of housing inner surface as the material layer which has viscoelasticity becomes an aisle side of air about the thin sound deadening sheet which consists of two-layer [of the material layer which has viscoelasticity, and a porous material layer]. And since the air layer which supports the material layer which has viscoelasticity uses the portion of the hole of a porous material, a sound deadening sheet can be formed inexpensive and attachment into the housing of a drier also has the advantage of being easy and easy. Since the surface is smooth, and is thin and a sound deadening sheet does not bar circulation of the air passing through the inside of a housing, even if it raises the rotational speed of a fan, a loud noise does not occur, but it can provide a drier with a low noise and large air capacity.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

The fragmentary sectional view, Fig. 3, or Fig. 5 in which the partial section perspective view in which Fig. 1 shows one working example of the present invention, and Fig. 2 show the working example from which the present invention differs is a cross sectional view of a sound deadening sheet, and Fig. 6 is a cross sectional view showing a conventional case.

1 ... housing, 2 ... motor, 3 ... fan, 5 ... heater, 6 ... suction opening, 7 ... discharge port, 8 ... bell mouth, 9 ... sound deadening sheet, 10 ... material layer, 11 ... sheet.

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⑲日本国特許庁（JP）　⑪特許出願公開

⑫公開特許公報（A）　昭64－29208

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A 45 D 20/12　C－7618－3B

審査請求　未請求　発明の数 1　（全3頁）

⑤4発明の名称　ヘアドライヤ

⑳特　願　昭62－187392
㉒出　願　昭62(1987)7月27日

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明　細　書

1．発明の名称

ヘアドライヤ

2．特許請求の範囲

（1）　粘弾性を有する材料と不織布、ろ紙、フェルトなどの多孔質材料を2層に積層した消音シートをモータ、ファン、ヒータ等が納装されたハウジングの内面の少くなくとも一部に粘弾性を有する材料層が空気の通路側になるように内張りしたことを特徴とするヘアドライヤ。

（2）　ハウジングの一ケ所に形成された吸込口からファンに至る流路上に配設され空気流を絞り込むベルマウスに消音シートを張ったことを特徴とする特許請求の範囲第1項に記載のヘアドライヤ。

3．発明の詳細な説明

〔技術分野〕

本発明は、モータの回転音やファンの風切り音等の騒音を低減させたヘアドライヤに関するものである。

〔背景技術〕

一般にヘアドライヤは、第6図に示すように、中空のハウジング1内に、駆動源であるモータ2、モータ2により回転駆動されるファン3、ファン3により加速された空気流を整流する整流板4、熱源であるヒータ5等を配設して構成され、ハウジング1の一所に設けた吸込口6からファン3の回転によりハウジング1内に導入された空気をヒータ5で加熱した後にハウジング1の他所に設けた吐出口7から熱風として吐出するようになっている。ヘアドライヤは、小型、軽量でかつ所定の風量を確保するという要求が基本性能として要求されており、このような要求を満たすために、ファン3の回転数を高めて風量を増大させることが考えられる。しかしながら、ファン3の回転数が高くなるにしたがって騒音が増大するという問題が生じる。このような問題を回避するために、モータ2の特性やファン3の形状を改善することにより、低回転数で所定の風量を確保する努力がなされているが、満足な結果を得るには至ってい

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ない。

〔発明の目的〕

本発明は上述の点に鑑みて為されたものであり、その目的とするところは、ハウジングの空気通路の内面の少なくとも一部に消音シートを張ることにより、風量を低下させることなく騒音の発生を低減させたヘアドライヤを提供することにある。

〔発明の開示〕

本発明に係る低騒音ヘアドライヤーは、粘弾性を有する材料と多孔質材料を2層に積層した消音シートをドライヤのハウジングの内面の少くなくとも一部に粘弾性を有する材料層が空気の通路側になるように内張りすることにより、ファンやモータから発生した騒音をハウジング外部へ伝搬する間に消音し、ヘアドライヤの発生騒音を低減させるものである。

以下、本発明を図面に基づいて説明する。消音シート9の従来例を第3図と第4図に示す。第3図に示す消音シート9は粘弾性を有する材料層10を形成するビニール・ゴム等の粘弾性材料からなるシートと不織布、ろ紙、フェルト等の多孔質材料からなるシート11を接着剤で接着積層したものであり、第4図に示す消音シート9は多孔質材料からなるシート11の表面に溶解したゴムを塗布したのち固めて粘弾性を有する材料層10を形成したものであり、粘弾性を有する材料層10が多孔質材料からなるシート11の表面の一部にはいりこんでいるものであり、いずれも以下に述べるごとく消音効果があるものである。

即ち、第3図または、第4図に示すような消音シート9の粘弾性を有する材料層10の表面上を音波が伝搬していく時、第5図に示すごとく、粘弾性を有する材料層10が音波によって振動し、音波のエネルギが粘弾性を有する材料内部のヒステリシス損として消費され音波が減衰することになる。粘弾性を有する材料層10の振動は、多孔質材料からなるシート11に支持されているので、空気バネにより支持され効率よくおこなわれるのである。

而して一般にヘアドライヤにおける主な騒音源は駆動源たるモータ2と送風用のファン3であり、騒音源より発生した騒音は主として吸入口6と吐出口7とから漏れるので、ハウジング1における騒音の伝達経路である空気の通路に消音シート9を張ることにより、騒音が低減されるのである。消音シート9は表面が滑らかな粘弾性を有する材料層10が空気通路に面しているので流れに対する抵抗が小さいうえ、消音シート9の厚みは通常2～3㎜以内と薄いものを使用するので消音シート9を張ることによる風量の低下は小さい。

（実施例1）

第1図に示すドライヤーでは、直管状に形成されているハウジング1の内面のファン3から一端の吸込口6の間に消音シート9が粘弾性を有する材料層10が空気の通路側になるように張りつけてある。7は他端の吐出口である。而してファン3から発生した騒音は吸込口6まで伝搬する間に消音シート9により低減させられる。結果としてドライヤ全体の騒音が小さくなる。

（実施例2）

第2図に示すドライヤーでは、吸込口6に配置され空気の通路を形成するベルマウス8の内側に消音シート9を粘弾性を有する材料層10が空気の通路側になるように張りつけた実施例である。ファン3から発生した騒音はベルマウス8の内側を通って吸込口6まで伝搬する間に消音シート9により低減させられ、ドライヤ全体の騒音が小さくなる。

〔発明の効果〕

本発明のヘアドライヤは、粘弾性を有する材料層と多孔質材料層の2層からなる薄い消音シートを、粘弾性を有する材料層が空気の通路側になるようにしてハウジング内面の少なくとも一部に内張りしているので騒音を低減できるという利点を有する。しかも粘弾性を有する材料層を支持する空気層は、多孔質材料の孔の部分を利用しているので消音シートは安価に形成でき、かつヘアドライヤのハウジング内への取付けも容易かつ簡単であるという利点がある。また消音シートは表面が

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なめらかで薄いのでハウジング内を通る空気の流通を妨げないから、ファンの回転数を高めても大きな騒音が発生せず、低騒音かつ風量の大きいヘアドライヤが提供できるのである。

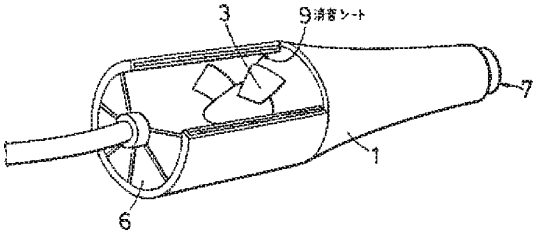
4. 図面の簡単な説明

第1図は本発明の一実施例を示す部分断面斜視図、第2図は本発明の異なる実施例を示す部分断面図、第3図乃至第5図は消音シートの断面図、第6図は従来例を示す断面図である。

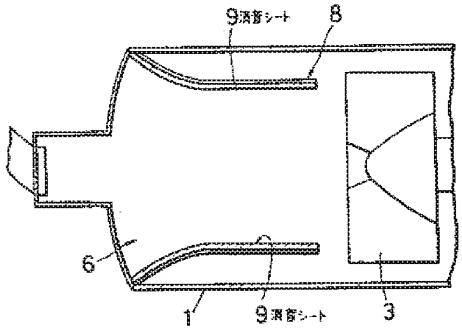
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特許出願人
松下電工株式会社
代理人弁理士 竹元敏丸
(ほか2名)

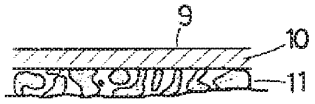
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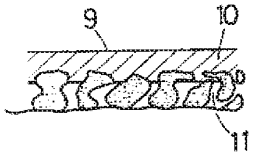
第2図



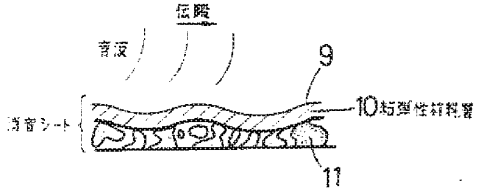
第3図



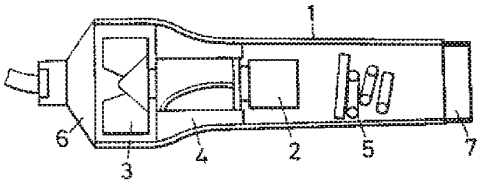
第4図



第5図



第6図



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(54)【発明の名称】　空気流制御手段を有する手持ち型ブロー・ドライヤ

(57)【要約】
複数の穴（６、７）を有するバレル（３）を含む手持ち型ブロー・ドライヤ。偏向機構（１６）をバレル（３）の中、または実質的にバレル（３）の中に配置することができ、また作動機構をこの偏向機構（１６）と作動的に結合させることができる。この手持ち型ブロー・ドライヤは、少なくとも、空気流をバレル（３）のバレル開口部を通すように向ける第１のモードと、少なくともバレル開口部が開く位置からバレル開口部が偏向機構により実質的に閉止される位置まで偏向機構（１６）を動かすために作動機構を作動させる第２モードとで使用することができる。かくして、第２モードではほとんどの空気が偏向機構により向きが変えられ、バレルの穴（６、７）を通るように強いられる。

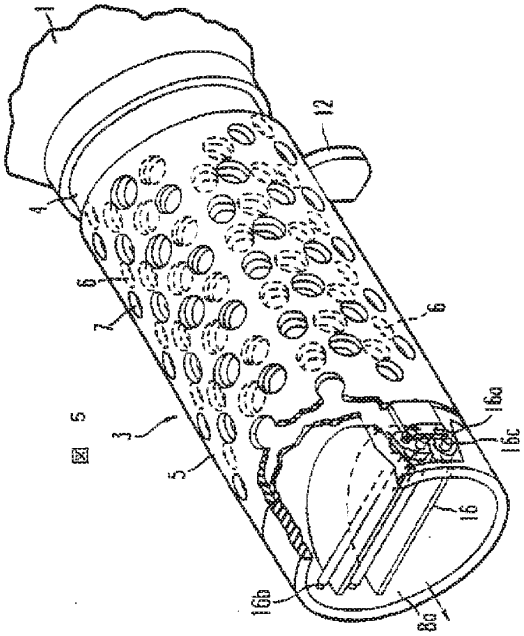


図５

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【特許請求の範囲】

１．バレル開口部を有するバレルを含む本体であってバレルが複数の穴を有する本体と、

前記バレル中に配置されるデフレクタであって、少なくとも前記バレル開口部が開放される開放位置と、前記バレル開口部が実質的に閉止される偏向位置との間で動くことができるデフレクタと、

前記デフレクタを少なくとも前記開放位置と前記偏向位置の間で動かすために前記デフレクタに作動的に接続されたアクチュエータ、を含むブロー・ドライヤ。

２．複数の穴を通過する空気流を部分的に遮るために前記バレルを取り巻いているメッシュ型スクリーンを更に包含する請求項１に記載のブロー・ドライヤ。

３．前記複数の穴を通過する空気流に対する抵抗を増加させるために前記バレル上の前記メッシュ型スクリーンを取り巻いている着脱可能な発泡型材料を更に包含する請求項２に記載のブロー・ドライヤ。

４．複数の穴を通過する空気流を部分的に遮るために前記バレルを取り巻いている着脱可能な発泡型材料を更に包含する請求項１に記載のブロー・ドライヤ。

５．前記発泡型材料が弾性体である請求項３に記載のブロー・ドライヤ。

６．前記発泡型材料が弾性体である請求項４に記載のブロー・ドライヤ。

７．前記複数の穴を通過する空気流を部分的に遮るために前記バレルの内側に円筒状に配置されたメッシュ型スクリーンを更に包含する請求項１に記載のブロー・ドライヤ。

８．前記複数の穴を通過する空気流を部分的に遮るために前記複数の穴それぞれの中に一体化したメッシュ型スクリーンを更に包含する請求項１に記載のブロー・ドライヤ。

９．前記デフレクタが前記バレル開口部に動けるように取付けられた第１および第２フラップを含む請求項１に記載のブロー・ドライヤ。

１０．前記アクチュエータが前記本体上に動けるように搭載された請求項１に記載のブロー・ドライヤ。

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１１．前記デフレクタを少なくとも開放位置に付勢するために前記バレル上に配置されたスプリング部材と、前記スプリング部材と前記アクチュエータとの間に延びる接続用部材とをさらに包含し、前記アクチュエータの動きが前記接続用部材の動きを引起し、デフレクタをスプリング部材に対向して付勢し、デフレクタを少なくとも実質閉止位置に動かすものである請求項１０に記載のブロー・ドライヤ。

１２．前記バレル中の前記穴が斜めになっている請求項１に記載のブロー・ドライヤ。

１３．バレル開口部を有するバレルを含む本体であって、バレルが同心の内側および外側シリンダを包含し、前記内側および外側シリンダのそれぞれが複数の穴を有する本体と、

前記内側または外側シリンダの何れか一方のものに作動的に接続され、この内側または外側シリンダの何れか一方のものを、前記内側または外側シリンダの他方のものに対して、少なくとも前記内側および外側シリンダの穴が合致しない第１位置と、前記内側および外側シリンダの前記穴が致する第２位置との間で動かすアクチュエータとを含むブロー・ドライヤ。

１４．複数の第１穴とバレル開口部を有するバレルを含む本体と、

前記バレル上で動けるように搭載され、かつ複数の第２穴を有するシリンダと、

前記バレル中に配置され、かつ少なくとも前記バレル開口部が開放される開放位置と前記バレル開口部が実質的に閉止される偏向位置の間を動くことができるデフレクタとを含むブロー・ドライヤ。

１５．開口部を有するバレルを包含し、当該バレルがそれぞれ複数の穴を有する第１および第２の同心シリンダを規定する本体と、

前記バレル中に配置され、かつ少なくとも前記バレル開口部が開放される開放位置と前記バレル開口部が実質的に閉止される偏向位置の間を動くことができるデフレクタと、

前記第１または第２シリンダの一方に作動的に接続されると共に前記デフレク

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タに作動的に結合され、デフレクタと前記第１または第２シリンダの前記一方を、少なくとも前記第１および第２シリンダの前記穴が合致せずかつデフレクタが開放位置にある第１位置と、前記第１および第２シリンダの前記穴が合致しかつデフレクタが偏向位置となる第２位置との間で移動させるアクチュエータとを含むブロー・ドライヤ。

１６．周囲に複数の穴を含むバレルを含む本体と、

実質的に前記バレル中に配置され、かつ少なくとも前記バレル開口部が開放される開放位置と前記バレル開口部が実質的に閉止される偏向位置の間を動くことができるデフレクタと、

前記デフレクタを少なくとも前記開放位置と前記偏向位置との間で動かすために前記デフレクタと作動的に結合されたアクチュエータとを含むブロー・ドライヤ。

１７．開口部を有するバレルを包含し、当該バレルがそれぞれ複数の穴を有する第１および第２の同心シリンダを規定する本体と、

実質的に前記バレル中に配置され、少なくとも前記バレル開口部が開放される開放位置と前記開口部が実質的に閉止される完全偏向位置との間を動くことができるデフレクタと、

前記第１または第２シリンダの一方に作動的に接続されると共に前記デフレクタと作動的に結合され、デフレクタと前記第１または第２シリンダの前記一方を、少なくとも前記第１および第２シリンダの前記穴が合致せずかつデフレクタが開放位置にある第１位置と、前記第１および第２シリンダの前記穴が合致しかつデフレクタが偏向位置となる第２位置との間で動かすアクチュエータとを含むブロー・ドライヤ。

１８．シリンダが第２穴の間に間隔をおいて形成された突起を含む請求項１４に記載のブロー・ドライヤ。

１９．前記突起が剛毛（bristles）である請求項１８に記載のブロー・ドライヤ。

２０．前記突起が歯（teeth）である請求項１８に記載のブロー・ドライヤ。

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２１．周囲に複数の穴を含むバレルを含む本体と、

実質的に前記バレルの中に配置され、前記バレル開口部が開放される開放位置、前記開口部が部分的に閉止される少なくとも１つの中間偏向位置、および前記バレル開口部が実質的に閉止される完全偏向位置の間を動くことができるデフレクタと、

前記デフレクタを前記開放位置、前記少なくとも１つの中間偏向位置、および前記完全偏向位置の間で動かすために前記デフレクタと作動的に結合されたアクチュエータとを含むブロー・ドライヤ。

２２．開口部を有するバレルを包含し、当該バレルがそれぞれ複数の穴を有する第１および第２の同心シリンダを規定する本体と、

実質的に前記バレルの中に配置され、前記バレル開口部が開放される開放位置、前記開口部が部分的に閉止される少なくとも１つの中間偏向位置、および前記バレル開口部が実質的に閉止される完全偏向位置の間で動くことができるデフレクタと、

前記第１および第２シリンダの一方に作動的に接続されると共に前記デフレクタに作動的に結合され、デフレクタと前記第１または第２シリンダを、少なくとも前記第１および第２シリンダの前記穴が合致せずかつデフレクタが開放位置になる第１位置と、前記第１および第２シリンダ上の前記穴が部分的に合致しかつデフレクタが中間偏向位置になる少なくとも１つの中間第２位置、ならびに第１および第２シリンダ上の前記穴が完全に合致しかつデフレクタが完全偏向位置になる第３位置の間で動かすアクチュエータとを含むブロー・ドライヤ。

２３．バレル開口部を有するバレルを含む本体であって、前記バレルがそれぞれ複数の穴を有する内側および外側シリンダを包含し、前記外側シリンダが前記内側シリンダに摺動可能に取付けられている本体と、

前記バレル開口部に配置された旋回型偏向手段であって、前記バレル開口部が開放される開放位置と、前記バレル開口部が偏向手段により実質的に閉止される偏向位置との間を旋回できる偏向手段と、

前記外側シリンダに作動的に接続されると共に前記偏向手段に作動的に結合さ

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れ、前記偏向手段と外側シリンダを、前記内側および外側シリンダの前記穴が合致せずかつ前記旋回型デフレクタ手段が前記開放位置になる第１位置と、前記内側および外側シリンダ上の前記穴が合致しかつ前記旋回型偏向手段が前記偏向位置になる第２位置との間で動かす作動手段とを含む手持ち型ブロー・ドライヤ。

２４．整髪したい髪に空気を向けるためのバレル開口部を有するバレルを含む本体であって、前記バレルが内側シリンダと当該内側シリンダと同心で前記内側シリンダに摺動自在に取付けられる外側シリンダを包含し、前記内側および外側シリンダのそれぞれの外側表面に複数の穴を含む本体と、

前記バレル開口部に取付けられた旋回型フラップ手段であって、前記バレル開口部が開放される第１フラップ位置と、前記バレル開口部が実質的に閉止される第２フラップ位置との間を旋回できる旋回型フラップ手段と、

前記外側シリンダに作動的に接続されると共に前記旋回型フラップ手段と作動的に結合され、前記外側シリンダを前記内側シリンダに対して摺動させ、かつ前記旋回型フラップ手段を旋回させる作動手段であって、前記作動手段の移動により前記外側シリンダの動きと前記旋回型フラップ手段の旋回を、前記内側シリンダ上の穴が前記外側シリンダ上の穴と合致せずかつ前記旋回型フラップ手段が前記第１フラップ位置になる第１位置と、前記内側シリンダ上の穴が前記外側シリンダ上の穴と合致しかつ旋回型フラップ手段が前記第２フラップ位置にあって実質的に前記バレル開口部を閉止させる第２位置との間で引き起こす作動手段とを

含む手持ち型ブロー・ドライヤ。

２５．前記内側シリンダが、前記外側シリンダ中のスロットと共働する突起停止部を包含し、当該突起停止部が前記外側シリンダの前記内側シリンダに対する摺動量を規定する請求項２４に記載のドライヤ。

２６．前記旋回型フラップ手段が第１および第２フラップを包含し、当該第１および第２フラップのそれぞれが、中にピンを配置した卵型アクチベータを包含し、第１および第２フラップを前記バレル開口部に旋回可能に取付けるために当該ピンが前記内側および外側シリンダ中の対応する細長のスロットを通して延びており、外側シリンダの前記第１位置から前記第２位置への動きにより、前記第

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１および第２フラップのピンが内側シリンダの細長のスロットに沿って引っ張られ、ピンと卵型アクチベータが回転され、それにより第１および第２フラップを回転させて前記バレル開口部を実質的に閉止させるようにした請求項２４に記載のドライヤ。

２７．前記作動手段が前記外側シリンダに配置される引き金であり、当該引き金が前記外側シリンダのスロット中に配置される少なくとも１つのスプリングを包含し、当該スプリングが前記外側シリンダを前記第１位置に付勢し、かつ前記引き金がスプリングの力に抗して前記外側シリンダを前記第２位置へ摺動させる請求項２４に記載のドライヤ。

２８．さらに前記ドライヤの高温設定と高温設定より低い温度設定の間を前記作動手段の動きに応じて変化させるために前記作動手段に作動的に接続された手段を含む、請求項２４に記載のドライヤ。

２９．前記外側シリンダが、髪を案内するために前記外側シリンダの長手方向に間隔をあけ、かつ前記外側シリンダの周囲の回りに延びるリングを包含し、当該リングが前記穴を通過する空気流に支障を与えないように配置されている、請求項２４に記載のドライヤ。

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【発明の詳細な説明】

空気流制御手段を有する手持ち型ブロー・ドライヤ

本出願は親米国出願第０８／５７６，５９２号の一部継続出願である。

技術分野

本発明はプロ用の調髪用ブロー・ドライヤの改良を提供するものであり、より具体的には、空気流を変化させることができ、かつエネルギーを節約できるブロー・ドライヤのバレル（胴体）を提供するものである。

背景技術

従来の整髪用の“ピストル型”ブロー・ドライヤは、ブロー・ドライヤの円筒状導管、即ちバレルの前端開口部を通る１方向の空気流を利用している。空気流を変えるためにバレル開口部に取付けることができる市販のアタッチメントは、両手による操作を必要とする。

米国特許第４，０９７，７２２号は、引き金によって作動するデフレクタ（反らせ板）により、バレル開口部の面積を調整することによって空気流を変える機構を記述している。しかしながらこの特許は、バレル表面自体から流れ出る空気流については開示していない。

米国特許第４，２３２，４５４号は、ノブ（取っ手）とスクリューで作動するトラップ扉を使用することにより、バレル開口部からの空気流を制御する。この方法もまた、両手による操作を必要とするという欠点がある。

米国特許第５，１５７，７５７号は、バレル上の第２出口などによって空気流を変化させる方法を記述している。しかしながら、この装置もその他の装置と同様に、両手による操作を必要とする。なぜならば、完全な作動は、カラー（環）の手動回転と手動設定によるものであり、またバレル開口部を変化させるために引き金によって操作されるバッフル（調節装置）に依存している。

ブロー・ドライヤを使用して整髪する間、理容師は片手でブロー・ドライヤを使用し、整えるべき髪にバレル開口部を向ける。ブラシまたはその他の整髪用道具はもう一方の手で使用する。さらに、中程度ないし長い髪をブロー整髪する場合には、理容師はバレルを水平にしてバレル開口部を頭から離れる方向に向け、

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もう一方の手に持っている道具を髪の毛に入れるために髪を持ち上げる。こうした作業の間、バレル開口部からの空気流は無駄になり、バレルそのものは乾燥／スタイリング能力に寄与しない。

このように、従来のブロー・ドライヤ装置はブロー・ドライヤのバレル表面を通って空気が流れるようにできるバレル装置を提供するものではない。そのうえ、従来のブロー・ドライヤ装置は、使用者が空気流をバレル開口部からそらせ、また同時に簡単な片手操作によりブロー・ドライヤのバレル表面を通して空気が流れるように空気流を偏向させる効果的な機構を提供していない。

発明の開示

本発明はしたがって上記で議論した従来装置の欠点を克服するブロー・ドライヤ装置を提供するものである。

本発明のブロー・ドライヤ装置はバレル表面からの空気流を変化させることによってブロー・ドライヤに機能を付加し、一方でエネルギー使用量を節約するものである。これにより、本発明のブロー・ドライヤは、水平状態での持ち上げ／乾燥／スタイリングに利用できると同時に、ホット・ローラならびにディフューザとしても利用できる。

本発明のブロー・ドライヤ装置はバレル表面に穴を設けることができ、またバレルに結合されたデフレクタを含むことができる。アクチュエータを作動させることにより、バレルに結合されたデフレクタは空気流の大半を程度を変えて絞ることができる。これにより、バレル上の穴からの空気流がある程度変化し、また空気がある程度前端開口部から拡散する。

したがって本発明は、バレル開口部を有すると共に複数の穴を有するバレルを含む本体と、バレルの中に配置され、少なくともバレル開口部が開放状態となる開放位置と、バレル開口部が実質的に閉止される偏向位置との間で動くことができるデフレクタと、デフレクタを少なくとも開放位置と偏向位置との間で動かすためにデフレクタに作動的に接続されたアクチュエータとを含むブロー・ドライヤを提供する。

本発明はまた、それぞれ複数の穴を有する同心の内側および外側円筒を含むバ

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レル開口部付きのバレルを含む本体と、内側および外側シリンダの一方のものと作動的に接続され、この内側および外側シリンダの一方のものを、内側および外側シリンダの他方のものに対して、少なくとも内側と外側シリンダの穴が合致しない第１位置と、内側および外側シリンダの穴が合致する第２位置との間で動かすアクチュエータとを含むブロー・ドライヤも提供する。

本発明はまた、複数の第１穴とバレル開口部を有するバレルと、バレル上に可動式に取付けられ、かつ複数の第２穴を有するシリンダと、バレル内に設けられかつバレル開口部が開放状態となる開放位置とバレル開口部が実質的に閉止される偏向位置との間で動くことができるデフレクタとを含むブロー・ドライヤも提供する。

本発明はまた、開口部を有するバレルを含む本体であって、バレルが複数の穴を有する第１および第２の同心シリンダを規定する本体と、バレル内に設けられたデフレクタであって、少なくとも開口部が開放される開放位置と開口部が実質的にデフレクタにより閉止されれる偏向位置との間を動くことができるデフレクタと、前記第１または第２シリンダの一方に作動的に接続されると共にデフレクタと作動的に結合され、デフレクタと第１または第２シリンダのその一方を、少なくとも第１および第２シリンダの穴が合致せずにデフレクタが開放位置になる第１位置と、第１および第２シリンダの穴が合致してデフレクタが偏向位置になる第２位置との間で動かすアクチュエータとを含むブロー・ドライヤも提供する。

本発明はまた、円周の周りに複数の穴を有するバレルを含む本体と、実質的にバレル内に配置されたデフレクタであって、バレル開口部が開放される開放位置とバレル開口部が実質的に閉止される偏向位置との間を動くことができるデフレクタと、デフレクタを少なくとも開放位置と偏向位置との間で動かすためにデフレクタに作動的に結合されたアクチュエータとを含むブロー・ドライヤも提供する。

本発明はまた、バレルを含む本体であって、バレルがそれぞれ複数の穴を有する第１および第２の同心シリンダを規定する本体と、実質的にバレル内に配置さ

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れたデフレクタであって少なくとも開口部が開放される開放位置と、開口部がデフレクタにより実質的に閉止される完全偏向位置との間を動けるデフレクタと、第１または第２シリンダの一方に作動的に接続されると共にデフレクタと作動的に結合され、デフレクタと第１または第２シリンダのその一方を、少なくとも第１および第２シリンダの穴が合致しない第１位置と、第１および第２シリンダの穴が合致しかつデフレクタが完全に偏向位置となる第２位置との間で移動させるアクチュエータとを含むブロー・ドライヤも提供する。

本発明はまた、バレルを含みその周囲に複数の穴を含む本体と、実質的にバレル内に配置されたデフレクタであって、バレル開口部が開放される開放位置、開口部が部分的に閉止される少なくとも１つの中間偏向位置、およびバレル開口部が実質的に閉止される完全偏向位置の間を動くことができるデフレクタ、デフレクタを開放位置、少なくとも１つの中間偏向位置、および完全偏向位置の間で動かすためにデフレクタと作動的に結合されたアクチュエータとを含むブロー・ドライヤも提供する。

本発明はまた、バレルを含む本体であって、バレルがそれぞれ複数の穴を有する第１および第２の同心シリンダを規定する本体と、実質的にバレル内に配置されたデフレクタであって、開口部が開放される少なくとも１つの開放位置、開口部がデフレクタにより部分的に閉止される少なくとも１つの中間偏向位置、および開口部がデフレクタにより実質的に閉止される完全偏向位置の間を動けるデフレクタと、第１または第２シリンダの一方に作動的に接続されると共にデフレクタと作動的に連結され、デフレクタと第１または第２シリンダのその一方を、少なくとも第１および第２シリンダ上の穴が合致せずかつデフレクタが開放位置になる第１の位置、第１および第２シリンダ上の穴が部分的に合致しかつデフレクタが中間偏向位置になる少なくとも１つの中間第２位置、および第１および第２シリンダ上の穴が完全に合致しかつデフレクタが完全偏向位置にくる第３位置の間で動かすアクチュエータとを含むブロー・ドライヤも提供する。

図面の簡単な説明

本発明とそれに付随する多くの利点は、添付の図面と関連させて以下の詳細な

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説明を参照することにより本発明がより良く理解されたときにより完全に分かるであろう。

図１は、本発明のブロー・ドライヤとバレル構造物が第１位置にあって、バレルの内側および外側シリンダの穴が合致していない状態を示す図であり、

図２は、図１のブロー・ドライヤが第１位置にある時のバレル開口部の正面図で、フラップまたは偏向手段が開放位置にある状態を示し、

図３は、内側および外側シリンダの穴が合致する第２位置にあるブロー・ドライヤのバレルの内側および外側シリンダを示す図であり、

図４は、内側および外側シリンダが図３に示されているように位置合わせされた時のバレル開口部の正面図であり、フラップまたは偏向手段が実質的にバレル開口部を閉じた状態であり、

図５は、バレルの内側および外側シリンダ、ならびにフラップまたは偏向手段が図１および２の第１位置にある斜視図であり、

図６は、図５に示されているような開放位置にあるフラップの斜視図であり、

図７は、図３および４の第２位置にあるフラップと内側および外側シリンダの斜視図であり、

図８は、フラップを分離して示したものであり、

図９（ａ）、９（ｂ）および９（ｃ）はそれぞれ、バレルの内側シリンダ、フラップ、ならびにカバーを示すものであり、

図１０は、本発明の外側シリンダを示し、

図１１（ａ）、１１（ｂ）および１１（ｃ）は、フラップの別の図を示し、

図１２は、ブロー・ドライヤ本体の別の実施態様を示し、

図１３は、本発明のブロー・ドライヤの温度設定を制御する回路図を示し、

図１４は、本発明の外側シリンダの変形例を示し、

図１５は、本発明のブロー・ドライヤのさらに別の変形例を示し、

図１６は、本発明のブロー・ドライヤのバレルのさらに別の変形例を示し、

図１７は、本発明のブロー・ドライヤのさらに別の実施態様で、当該ブロー・ドライヤ本体が複数の穴とデフレクタを有するバレルを含むものを示し、

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図１８は、図１７のブロー・ドライヤのさらに別の変形を示し、当該ブロー・ドライヤがバレルを取り巻くメッシュ型のスクリーンを含むものを示し、

図１９は、本発明のブロー・ドライヤの正面図で、デフレクタが開放位置にある状態を示し、

図２０は、本発明のブロー・ドライヤの正面図で、デフレクタが最終閉止位置にある状態を示し、

図２１は、図１８のブロー・ドライヤのバレルのさらに別の変形で、発泡型メッシュがバレルを取り囲んでいるものであり、

図２２は、バレルのさらに別の変形で、バレル組立体上の複数の穴が斜めになっているものを示し、

図２３は、バレルのさらに別の変形で、メッシュ型スクリーンがバレル内に放射状に配置されているものを示し、

図２４は、本発明のバレルのさらに別の変形で、バレルの穴が穴内のメッシュ型スクリーンと一体化されているものを示し、

図２５（ａ）および２５（ｂ）は、本発明のブロー・ドライヤの実施態様の側面図で、デフレクタ機構を作動させるためのメカニズムを示し、

図２６は、第１実施態様のバレルの別図であり、

図２７は、バレルのさらに別の変形を示す側面図であり、そして

図２８は、図１９および２０に基づくバレルの正面図である。

本発明を実施するための最良の態様

いくつかの図を通して使用されている同一の参照番号は同一または対応する部品を示している。図を参照すると、特に図１と５を参照すると、図１は本発明のブロー・ドライヤ組立体の最初の図であり、一方図５はその斜視図である。図１および５において、当該ブロー・ドライヤはバレル３を有する本体１を含んでいる。バレル３は、内側シリンダ４と、内側シリンダ４と同心の外側シリンダ５を含むものとすることができる。外側シリンダ５は内側シリンダ４の上にスライド（摺動）可能に取付けられている。内側および外側シリンダ（４、５）の各々はその上に形成された複数の穴（６、７）を有する（穴６は内側シリンダ４の上、

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穴７は外側シリンダ５の上）。

さらに図１および６に示されているように、当該ブロー・ドライヤ組立体はまた旋回型フラップ機構１６を覆うキャップ８を含むこともできる。キャップ８と旋回型フラップ機構１６はバレル開口部８ａに位置決めされている。図６のキャップ８は切欠き開口部を示しているが、キャップ８はバレル前面の旋回型フラップ機構１６を含むすべての可動機構を完全にカバーすることもできる。しかしながら出願人は、本発明はキャップ８を使用せずに実施することもでき、キャップ８の使用はデザイン的な配慮によるものであることを付記しておく。

図１、５および６は、外側シリンダ５が内側シリンダ４に対して第１位置にある状態を示しており、そこでは外側シリンダ５上の穴７は内側シリンダ４の穴６とは合っておらず、また旋回型フラップ機構１６は開放位置にある。したがってバレル３を通る空気流はすべてバレル開口部８ａを通して流れ出る。内側および外側シリンダ４、５の合っていない穴６および７は、バレル３の表面を通過しようとする如何なる空気流も遮断する。

図３および７に示されている位置においては、内側および外側シリンダ４、５のそれぞれの穴６、７が合うように、内側および外側シリンダ４、５が位置合わせされている。図３および７に示されている位置においては、フラップ機構１６は図４および７に示されているように位置決めされる。つまり、フラップ機構１６は図４および７に示されているように、バレル開口部８ａを実質的にカバーするように位置決めされる。

内側および外側シリンダ４、５相互間の動きは、上記したようにしてフラップ機構１６を位置決めするためのフラップ機構１６の動きと連動するようになっている。この位置（すなわち図７）においては、フラップ機構１６は空気流を内側および外側シリンダ４、５の合致した穴６と７の方向に向くように空気流のほとんどが偏向される。かくして、空気はバレル３の表面を通過して放出されることになる。したがってアクチュエータ１２を作動させることにより、使用者は徐々に、制御可能にまたは連続的に、フラップ機構１６を開放位置から、たとえば図７に示されているような実質的に閉止された位置まで動かすことができる。さら

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なるオプションとして、アクチュエータ１２を作動させることにより、使用者はフラップ機構１６を開放位置から、１つまたは複数の中間偏向位置（中間偏向位置の例は図２６と２８に示されている）に、徐々に、制御可能にまたは連続的に動かすことができ、これによりバレル開口部８ａを望ましい部分的閉止状態とすることができ、さらにたとえば図７に示されているような最終的な実質的閉止位置まで動かすこともできる。

アクチュエータの動きと連動して外側シリンダ５はＡ方向に動くことができ、内側および外側シリンダ４、５の穴６、７を図５の完全に合致していない位置から、たとえば図７に示されているように穴６、７が完全に合わさる最終位置まで動かすことができる。さらなるオプションとして、完全に合致していない位置（図５）と完全に合致した位置（図７）の間で、アクチュエータの動きに連動さ

せて、外側シリンダ５を、穴６、７が部分的に合致していない１つまたは複数の中間位置（図２６参照）まで動かすこともできる。

アクチュエータ１２は使用者が制御できるようにするために連続的に動き得るものとするか、あるいは上記に対応する位置でアクチュエータを停止させるための１つまたは複数の停止部を備えることもできる。

また、図２６は反時計方向に動く上部フラップ１６’と、時計方向に動く下部フラップ１６”を示している。ただし、フラップの回転運動は開示した動きだけに限定されるものではない。要求に応じてバレル開口部を開放および閉止するために、バレル３の中でのフラップ機構１６の位置に応じて、フラップは時計方向または反時計方向のいずれにも動くことができる。同じことがデフレクタ１０９の中間位置の例を示している図２８にも当てはまる。したがってデフレクタの回転方向はデザイン的な配慮に基づいて決定されることは分かるであろう。

さらなる実施態様の１つとして出願人は、アクチュエータ１２の作動により、まず外側または内側シリンダ５、４の１つの動きを引起し、その後フラップ機構１６を実質閉止位置へ遅れて動かすこともできることを付記しておく。この方式であれば拡散された空気がある程度バレル開口部を通して逃げるようにできる。

内側および外側シリンダ４、５ならびにフラップ機構１６の上記の動きを達成

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するための機構の一例を以下に説明する。図５－８、ならびに図９（ｂ）および１１（ａ）－１１（ｃ）に示されているように、旋回型フラップ機構１６は取付け軸１６ｂとそこから突き出た取付けピン１６ｃを有する第１および第２フラップ１６’、１６”を含む。図８に示されているように、取付けピン１６ｃは卵型アクチベータ１６ａの上に偏心させて（offset manner）取付けられている。

本発明では滑らかな操作ができるように、ワッシャー１６ｄ（図９および１１（ａ）－１１（ｃ））を取付けピン１６ｃの部分に利用することもできる。取付けピン１６ｃを備えた旋回型フラップ機構１６は、バレル３の中、または実質的にバレル３の中、あるいはバレル開口部８（ａ）の位置に以下のようにして取付けられる。

すなわち、取付け軸１６ｂとピン１６ｃを内側シリンダ４の細長のスロット１７および外側シリンダ５の細長のスロット１１の中に挿入して取付ける（図６、図９（ａ）および図１０参照）。外側シリンダ５のスロット１１は外側シリンダ５の突出部５ａの上に設けられる。したがって、外側シリンダ５の矢印Ａ方向の動き（図１および７）により、旋回フラップ機構１６が、少なくとも図５に示されているバレル開口部８ａが開かれる位置から、図７に示されているバレル開口部８ａが実質的に閉止される位置まで動く。これは外側シリンダ５のＡ方向の動きにより、旋回フラップ機構１６のピン１６ｃが卵型アクチュエータ１６ａとともに回転し、それによって旋回フラップ機構１６が実質閉止位置まで回転することによるものである。

外側シリンダ５は、たとえば外側シリンダ５を内側シリンダ４に対して摺動させるために利用される引き金１２のような、アクチュエータを含むことができる。アクチュエータまたは引き金１２は、ピン１４によって案内された外側シリンダ５のスロット１５の中に位置決めされたスプリング１３を含む（図１、３、１０）。このスプリング１３は外側シリンダ５を方向Ａと反対方向に動かす。例えば、引き金１２をＡ方向に引くなどしてアクチュエータを作動させると、外側シリンダ５がＡ方向に動き、それにより旋回型フラップ機構１６が少なくとも図５に示されている位置から図７に示されている実質閉止位置まで動く。図１、３、

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および１０はバレル組立体３の下部に配置された１本のスプリング１３を示している。しかしながら、バレル組立体にはシリンダ（４、５）の動きに安定性を加えるために、バレル組立体３の径方向に対向する部分に配置された２本のスプリング１３を含むこともできる。

これと同時に、またはほぼ同時に、外側シリンダ５のＡ方向への動きにより、内側および外側シリンダ４、５の穴６、７が図７に示されているように合致する。

したがって、図１および５に示されている第１位置（第１モード）においては、

旋回フラップ機構１６は図５に示されている位置にあり、空気流をバレル開口部８ａを通して流れるようにし、また内側および外側シリンダ４、５の穴は合致せず（図１および５）に、バレル３の表面を通しての空気流を阻止する。これにより使用者はこのブロー・ドライヤを通常の方法で使用することが可能となる。

理容師がブロー・ドライヤを、水平状態での持ち上げ／乾燥、スタイリングのために、またホット・ローラとしてまたはディフューザなどとして使用したい場合、理容師はたとえば引き金１２をＡ方向に引いてアクチュエータを作動させ、内側シリンダ４に対する外側シリンダ５を図３および７に示されているような位置（第２または最終モード）にする。これによって内側および外側シリンダ４、５の上の穴６、７が合致し、またフラップ機構１６のフラップ１６’、１６”が図７に示されている位置に向けて徐々に旋回し、バレル開口部８ａを実質的に閉止する。この位置では、フラップ１６’、１６”は空気をバレル上に露出している合致した穴６、７に向けて偏向させ、いくらかの拡散された空気がバレル開口部８ａを通して流出する。本発明のさらなる特徴として、使用者はアクチュエータ１２を中間位置に動かすことができ、それによりフラップ機構１６を中間偏向位置（図２６にその１つの位置が示されている）を通過して制御しながら動かし、また内側または外側シリンダ４、５の１つを穴６、７が部分的に合致する中間位置に動かして（図２６）、部分的な偏向により望ましい空気流が部分的に合致した穴６、７を通るようにすることができる。したがって、アクチュエータ１２

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の中間位置を利用することにより、使用者はフラップ機構１６による偏向量と穴６、７の合致のための位置決めを細かく制御できる。

本発明は、フラップ機構およびシリンダを動かすための構成として記述したものに限定されるものではなく、たとえば上記のような望ましい動きを達成することができる歯車など、あらゆる装置を使用することができることは分かるであろう。

外側シリンダ５の内側シリンダ４に対する動きの量は、図１、３、９（ａ）および１０に示されているように、外側シリンダ５上の細長のスロット１０と内側シリンダ４上にピン９を備えることにより決めることができる。バレル開口部８ａが図７に示されているようにフラップ１６’、１６”によって実質的に閉止される場合、空気がバレル開口部からある程度放散されるように、このバレル開口部８ａはフラップ１６’、１６”によって緊密にシールされないようにする。

本発明はまた図６および９（ｃ）に示されているようなキャップ８を備えることもでき、このキャップはフラップ機構１６をカバーするために利用することができる。フラップ機構１６の側面を示すためにキャップ８は切欠部を示している。キャップ８はバレル前端部の周辺を完全に取り巻くものにすることができることは分かるであろう。キャップ８を外側シリンダ５上に嵌装できるようにし、またフラップ機構１６の軸１６ｂとピン１６ｃを挿入できるような穴が形成されるようにキャップ８には停止部８０（図９（ｃ））も設けられている。

本発明ブロー・ドライヤ装置はまた図１２に示されているように、モータ・ハウジング内に膨らみ型の曲面６０を有するブロー・ドライヤ１ａまたはその他あらゆるタイプの本体に使用することもできる。膨らみ型の本体の場合、アクチュエータまたは引き金１２ａはハウジングの曲面に適合する曲面を持ったものとする。この実施態様も前述の実施態様と同様の作動をする。

加えて、本発明のアクチュエータまたは引き金１２は、引き金１２の作動をブロー・ドライヤの温度設定と連携させる制御機構５０（図１３）と作動的に結合させることもできる。たとえば、従来のブロー・ドライヤには、低温、中温および高温設定を含むことができる。本発明の引き金機構１２を図１３に示されてい

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るように、引き金１２を作動した時にブロー・ドライヤの高温設定を高設定温度よりも低い温度に下げるように制御機構５０と連動させることもできる。

図１３に示されているように、アクチュエータまたは引き金１２を、穴６、７が合致せず、かつ空気流がバレルの前端開口部８ａを通して流れるような第１位置（図１および５）に位置決めすれば、ヘアー・ドライヤの設定をブロー・ドライヤの高温設定（R_1）に設定することができる。アクチュエータまたは引き金１２を、穴６、７が合致し、かつ前端開口部８ａが実質的に閉止されるような第２または最終位置（図３および７）に移動すれば、ドライヤの設定をブロー・ドライヤの高温設定より低い温度設定（R_2）にすることができる。上記の説明は、アクチュエータまたは引き金を完全に作動させた時にブロー・ドライヤが高温設定となる場合についてのものであった。引き金１２を作動させた時にブロー・ドライヤが中温または低温に設定されている場合には温度を下げないように制御機構５０を設計できることは分かるであろう。しかしながら、引き金１２が作動された時にブロー・ドライヤの温度設定を下げるようにすることは、設計的な配慮とアクチュエータまたは引き金１２を作動した時に望ましいとされる希望温度に基づくものである。さらに、ブロー・ドライヤには使用者が高温からそれより低い温度へ選択的に温度を下げることができるように、アクチュエータまたは引き金１２の作動と連携しない追加のアクチュエータまたは引き金機構を包含させることもできる。

図１４はバレル３の外側シリンダ５のさらに別の実施態様を示し、当該外側シリンダ５は外側シリンダ５の長手方向に間隔を空けたリング２００を含み、それらリングは外側シリンダ５の外周に固定され、また外側シリンダ５の周囲の回りに延在する。このリング２００はバレル組立体を髪に当てた時に髪を案内する役目をする。これらリング２００は穴（６、７）からの空気流のじゃまにならないように配列される。これらのリング２００は開示した実施態様のいずれにも利用することができる。

図１５はバレル３のさらに別の実施態様を示し、ここではバレル３の外側シリンダ５に、図に示されているようにバレルの穴７の間に、穴７の間に１列に延び

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るように間隔を空けて、剛毛（bristle）または歯（teeth）３００のような突起物を設けたものを示している。剛毛または歯３００はバレル３の外側シリンダ５の周囲に延びるものとすることができ、髪を案内したりスタイリングをさらにやりやすくするために利用することができる。これら突起物３００はリング２００と同様、開示した実施態様のいずれにも利用することができる。

図１は外側シリンダを内側シリンダに対して摺動できるように、バレルの外側シリンダに作動的に接続されたアクチュエータを示している。しかしながら、本発明はこの構成に限定されるものではなく、出願人はさらに別の実施態様として内側シリンダ４が外側シリンダ５の中で摺動できるもの（図１６）も付記しておく。この実施態様においては、外側シリンダ５は本体１に固定または一体化される。この構成によれば、内側シリンダ４を外側シリンダ５に対して摺動できるようにアクチュエータ１２に作動的に接続することができる。本発明のその他の特徴部分に関しては、この装置も第１実施態様で説明したのと同様に作動する。

図１７は本発明のブロー・ドライヤのさらに別の実施態様を示す。図１７において、本体１００は前述の実施態様に示した本体１と同様のものとすることができる。図１７の実施態様では、本体１００に固定または一体化され、かつ複数の穴１０５を有するバレル１０３が含まれている。デフレクタ１０９はバレル１０３の中、または実質的にバレル１０３の中、に配置することができる。１例としてデフレクタ１０９は図１９および２０に示されているように、バレル１０３の開口部１０７に配置することができる。デフレクタ１０９は先の実施態様に示したように配列するか、図１９および２０に示されているように垂直に配列したデフレクタとすることもできる。しかしながら出願人は、デフレクタ１０９の方向は図示されているような水平または垂直の配置に限定されるものではなく、バレル１０３の中にどのような向きにでも配置できることを付記しておく。

図１９および２０のデフレクタ１０９は、フラップ１０９ａ、１０９ｂ、ならびにプレート部材１１１およびスプリング装置１１５（図２５（ａ）、２５（ｂ））を含み、このスプリング装置がデフレクタ１０９を図１９および２５

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（ａ）に示されているように開放位置に保つ。プレート部材１１１には接続用部材１１７が取付けられ、この部材はバレル１０３に沿ってバレル１０３または本体１００の上のアクチュエータ１１９まで延びる。これらの図では接続用部材１１７が図２７に示されているようにバレル１０３の外側にあるが、接続用部材１１７はバレル１０３の中に含ませることができるのは分かるであろう。

アクチュエータ１１９をＢ方向に作動させると、プレート部材１１１がＣ方向に動き（図２５（ｂ））、フラップ１０９ａ、１０９ｂがピボット（Pivot）点８００の周りで徐々に旋回または回転する。これによりデフレクタ機構１０９が少なくとも図１９および２５（ａ）に示されている開放位置から図２０および２５（ｂ）の実質的な閉止位置まで動く。先に説明したように、要求される空気流および設計的配慮によって開放位置と実質閉止位置との間の異なる中間偏向位置（その１つが図２８に示されている）にデフレクタ１０９を動かすようにアクチュエータ１１９を適合できることは分かるであろう。

プレート部材１１１とスプリング装置１１５はバレル１０３の膨らんだ部分４００に示されているが、この構成は例示のためおよび説明を明確にするために示したものである。プレート部材１１１、スプリング１１５および接続部材１１７は、図１、１６および２８に示されているような連続した直線的なバレルを提供できるように、バレル１０３の中に配置または組み込むことができることは分かるであろう。

図１７に示されている実施態様では、通常のブロー乾燥操作の間はデフレクタ１０９が開放位置にあり（図１９）、空気はバレル１０３の開口部１０７を通して流れる。バレル１０３に沿って設けられた穴１０５はいくらかの空気がこの穴１０５を通して流れるようにするが、これは従来あるいは通常のブロー乾燥操作に支障をきたさない程度である。

理容師がブロー・ドライヤを、水平状態での持ち上げ／乾燥、スタイリングのために、またはホットローラ、ディフューザ等として使用したい場合は、理容師

はアクチュエータ１１９をＢ方向に徐々に操作し、実質的にバレル開口部１０７をデフレクタ１０９で閉止する。したがってデフレクタ１０９がバレル１０３を

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通して流れる空気のほとんどをそらして、バレル１０３上の穴１０５を通るようにし、それによりブロー・ドライヤを水平状態での持ち上げ／乾燥などに使用することができることになる。デフレクタ１０９は実質閉止位置まで作動されるが、使用者の好みに応じてさらに、デフレクタの開放位置と実質閉止位置との間の中間偏向位置で空気の偏向の度合い変えることができる。この実施態様においては、デフレクタ１０９の中間位置に相当するいくつかの停止位置を提供できるようにアクチュエータ１１９を変形させることも可能である。しかしながら、使用者がデフレクションの量を制御できるように、アクチュエータ１１９を自由かつ連続的に動かし得るようにすることも可能である。

さて図１７に戻り、ブロー・ドライヤのデフレクタ１０９が開放位置（図１９）にある通常動作の間に、もし使用者がバレル１０３の穴１０５から逃げる空気を少なくすることを望む場合、本発明のさらなる実施態様として、バレル１０３の周囲に円箇状に位置決めしたメッシュ型スクリーン１２１をバレル１０３に設けることもできる。メッシュ型スクリーン１２１は図１９のブロー乾燥モードにおいて、穴１０５を通して通過するいくらかの空気を遮断したり、抵抗を与えるのに役立つ。しかしながら、変化する偏向位置ならびに図２０のようにデフレクタ１０９が実質的にバレル開口部１０７を閉止する偏向位置においては、十分な空気が穴１０５を通り、水平状態での持ち上げ／乾燥などができる。図１８に示されているようなメッシュ型スクリーン１２１を備えたバレル１０３の実施態様では、メッシュがバレル１０３の周囲に設けられている。しかしながらさらなるオプションとして、このメッシュ型スクリーン１２１を図２３に示されているようにバレル１０３の中に円箇状に配置したり、あるいはメッシュ型スクリーン１２１を図２４に示すように穴の中に一体化して配置することも可能である。

さらなるオプションとして、発泡型カバー１２３をメッシュ型スクリーン１２１の上またはバレル１０３の上に備え（図２１）、図１９の通常または従来のブロー乾燥操作中に穴１０５を通して流れるいくらかの空気をさらに遮断したり、抵抗を与えることも可能である。しかしながら発泡型カバー１２３は多孔性であり、デフレクタ１０９が開放位置と実質閉止位置との間の中間偏向位置にあ

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る場合は、偏向された空気が穴１０５を通り、または実質閉止位置（図２０）にある場合はバレル表面から逃げる。これにより、使用者はこのブロー・ドライヤを水平状態での持ち上げ／乾燥などに利用することができる。

メッシュ型スクリーン１２１は、ブロー乾燥動作で用いられる温度に耐えられるもので、かつバレル１０３に沿うような円筒形状に曲げることができるものであればいかなる種類の材料で作ってもよい。たとえば、メッシュ型スクリーン１２１を金網の枠型グリッドとすることができる。発泡体１２３もまた、ブロー乾燥操作の温度に耐えられるもので、かつバレル１０３に容易に着脱できるような弾性型の部材であればいかなる材料でも作ることができる。メッシュおよび発泡体の材料は、ブロー・ドライヤの偏向位置において（図２０）、ブロー・ドライヤを水平持ち上げ／乾燥などに使用するために穴１０５を通して流れ出る空気が材料中を通過できるようにするものとする。

本発明のさらなる特徴として、偏向位置における空気の方向をさまざまに変化できるように（図２０）、またデフレクタ１０９が開いている通常の操作でブロー・ドライヤを使用する時（図１９）に空気に望ましい抵抗を与えるために、バレル１０３上の穴１０５を斜めにすることもできる（図２２）。図２２は穴１０５が１方向に斜めになっているものを示しているが、穴１０５はデザイン的な配慮によりさまざまな方向の斜めとすることもできることは分かるであろう。

また、図１７に図示されているブロー・ドライヤは膨らみ型の本体を示しているが、アクチュエータ１１９は使用されるバレルの種類およびブロー・ドライヤ本体に応じてブロー・ドライヤ組立体のいかなる場所でも配置することができる。上記実施態様のブロー・ドライヤはまた図１３に示されているような制御機構５０を使用することもできる。さらにこれら実施態様のブロー・ドライヤのバレルには、図１４および１５に示されているリング２００ならびに剛毛（bristles）または歯（teeth）３００に関しての種々の変形例が含まれる。

以上のように、本発明のブロー・ドライヤは１つの道具の中に複数の機能を組み込むことによってブロー・ドライヤの能力を最高度に高めるものである。それによって本発明のブロー・ドライヤは、片手で操作される単一の道具を使用する

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ことにより理容師またはスタイリストが広範囲の空気流を使用できるようにするものである。つまり、引き金１２を引くなどの簡単なアクチュエータの操作により、理容師はバレルを通過する空気流を変えることができる。現在のブロー・ドライヤと同様に、必要とされる任意のアタッチメントを本発明のバレルに取付けることができ、またアクチュエータの操作の有無に関わらずそれらを使用することができる。本発明のブロー・ドライヤは大型のホット・ローラとしても使用することができ、アクチュエータを操作した場合にバレル開口部から空気をある程度拡散させる能力があり、またもしブロー・ドライヤのモータ速度をより低く設定すればバレル表面全体からも拡散させることができる。

当然のことながら、上記開示に照らせば本発明の多くの変形や変更が可能である。したがって添付の請求の範囲内において本発明を本明細書に具体的に説明した以外の態様で実施できることは理解されよう。

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【図１】

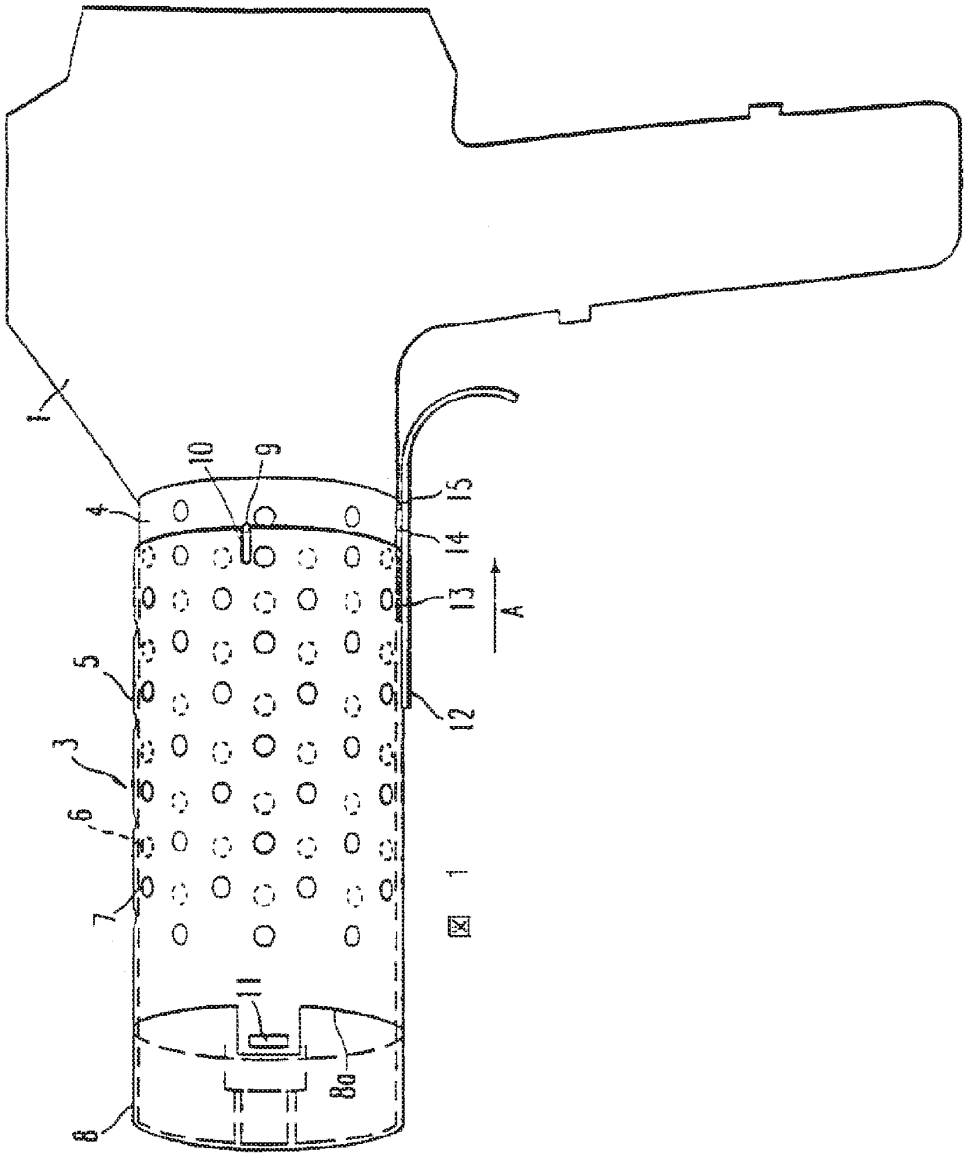


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【図２】

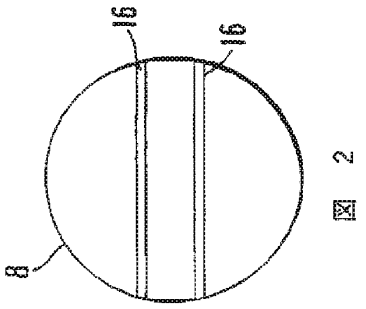


図２

【図３】

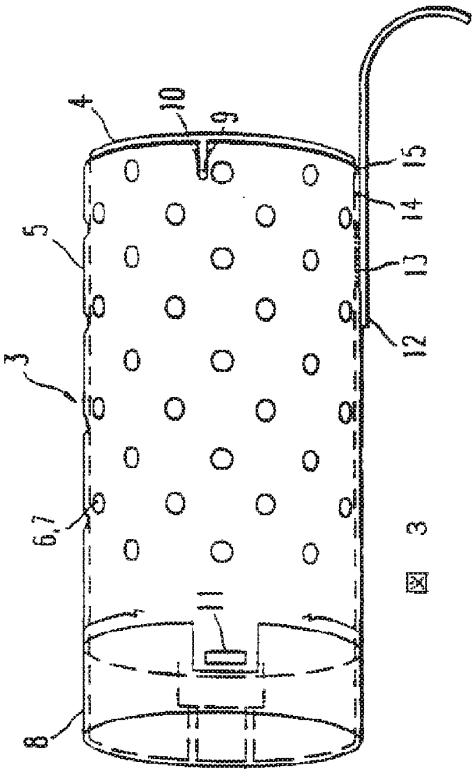


図３

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【図４】

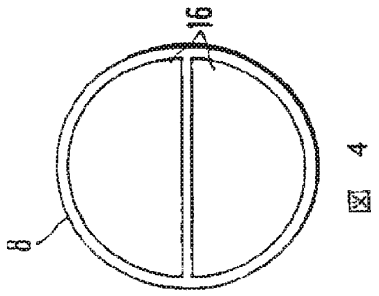


図４

【図５】

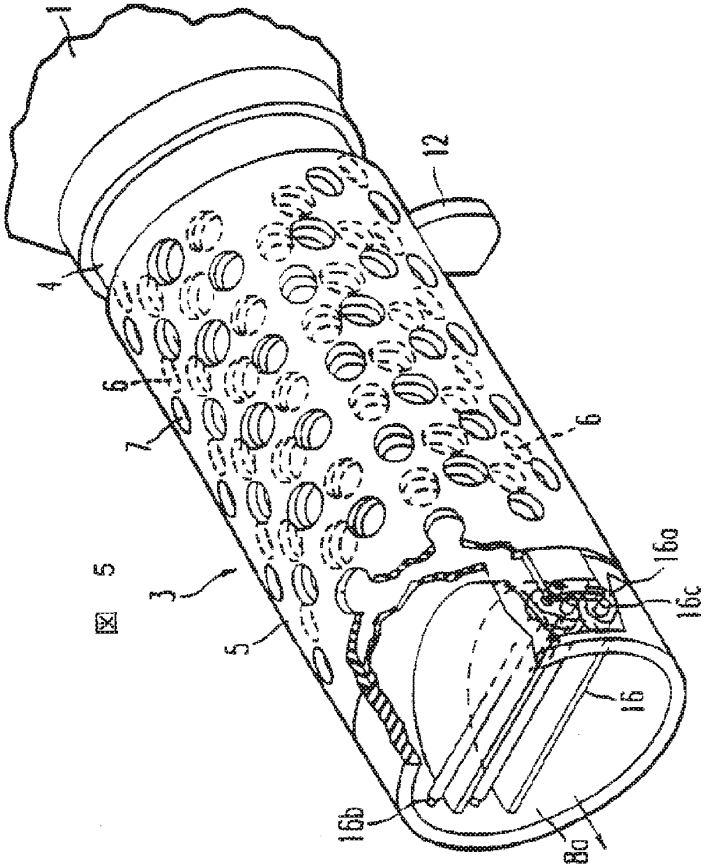


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【図６】

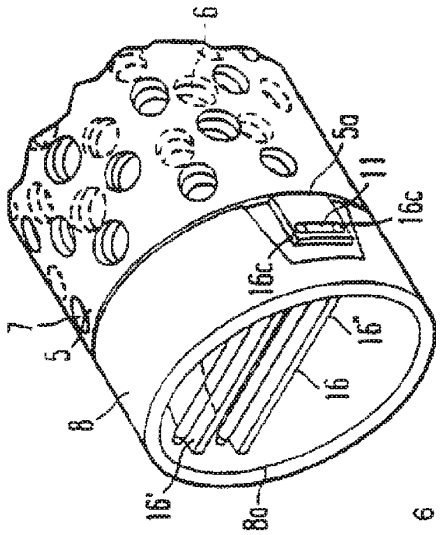


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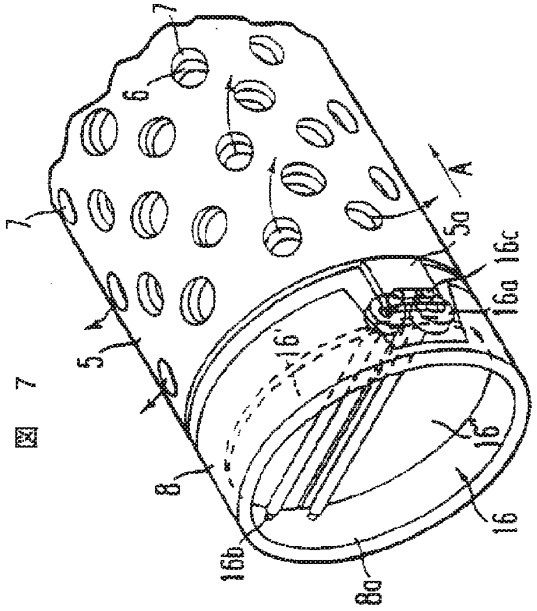


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Page 402 of 1998

【図８】

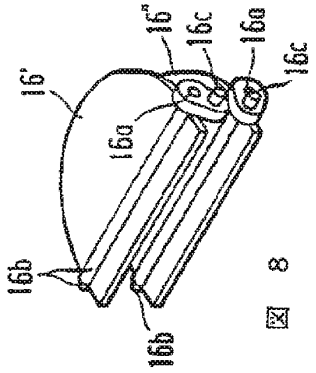


図８

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【図９】

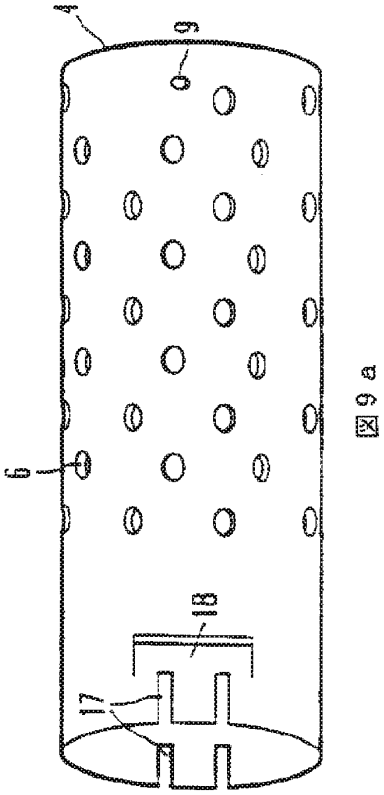


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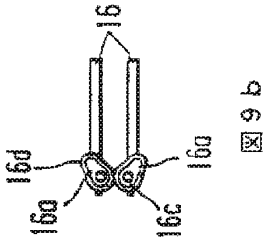


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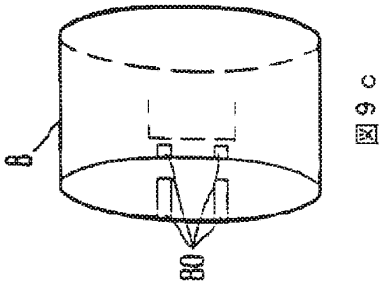


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【図１０】

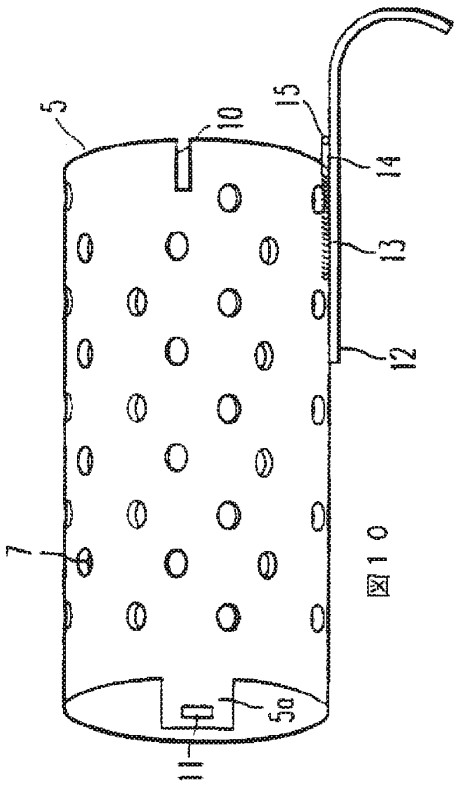


図１０

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【図１１】

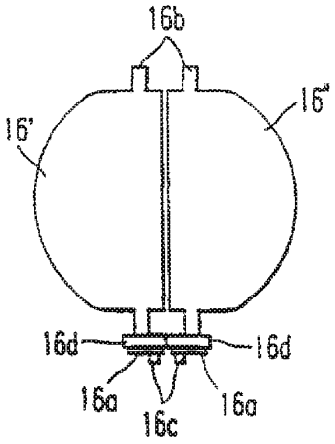


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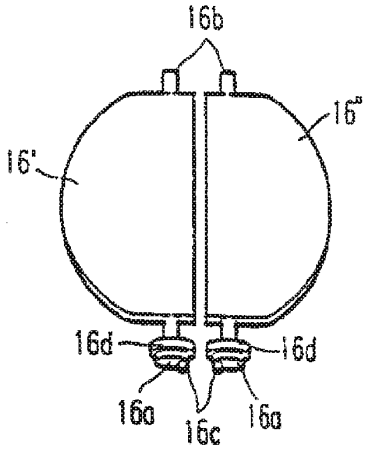


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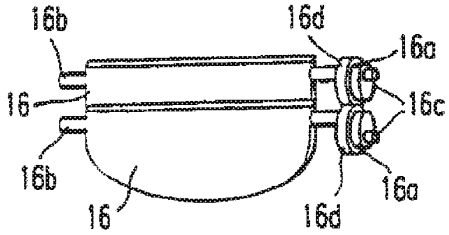


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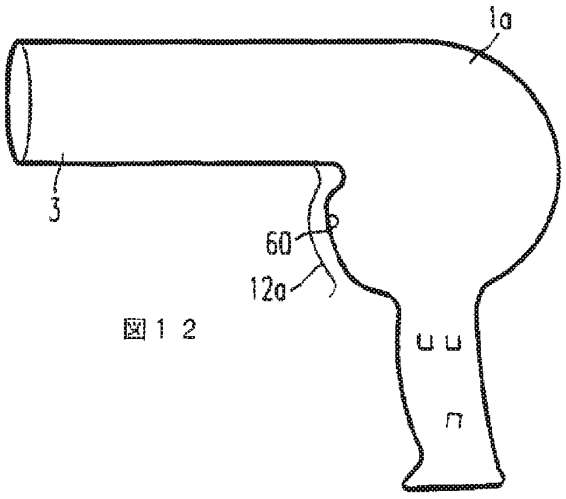
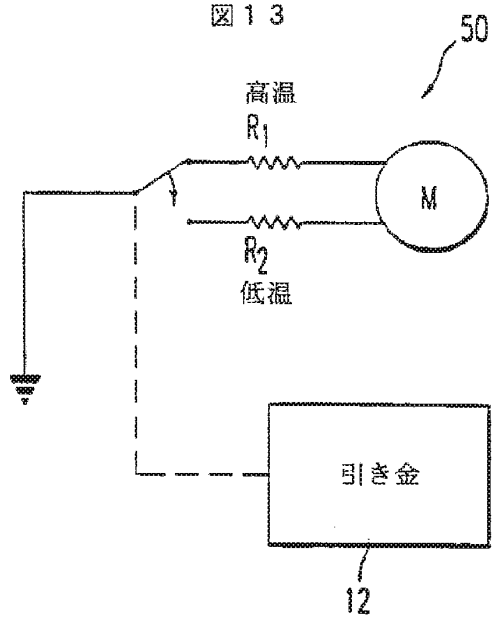


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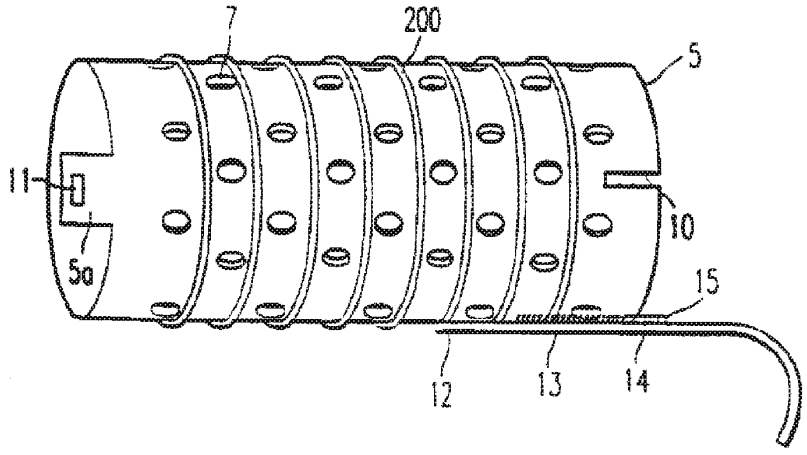
【図１３】

図１３



【図１４】

図１４



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Page 407 of 1998

【図１５】

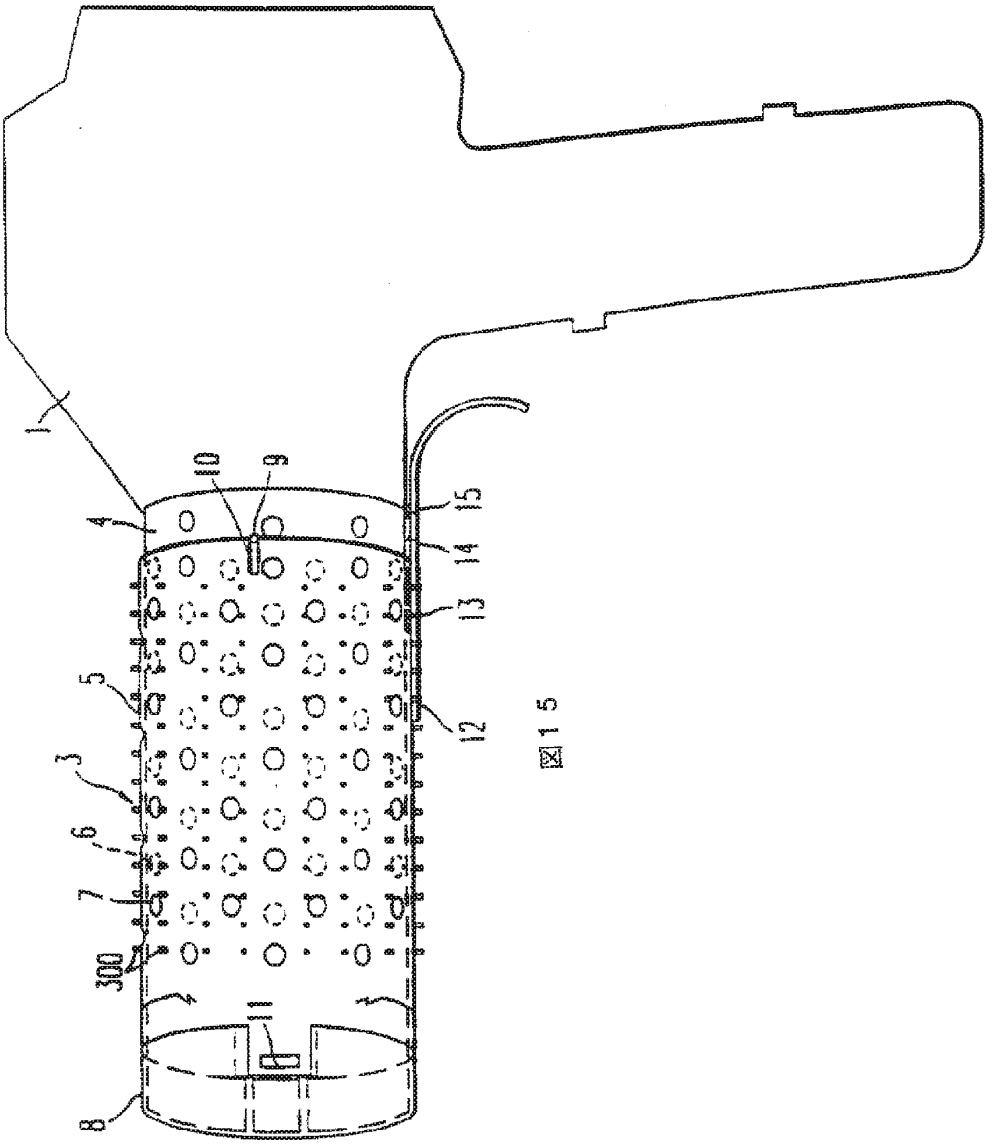


図１５

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Page 408 of 1998

【図１６】

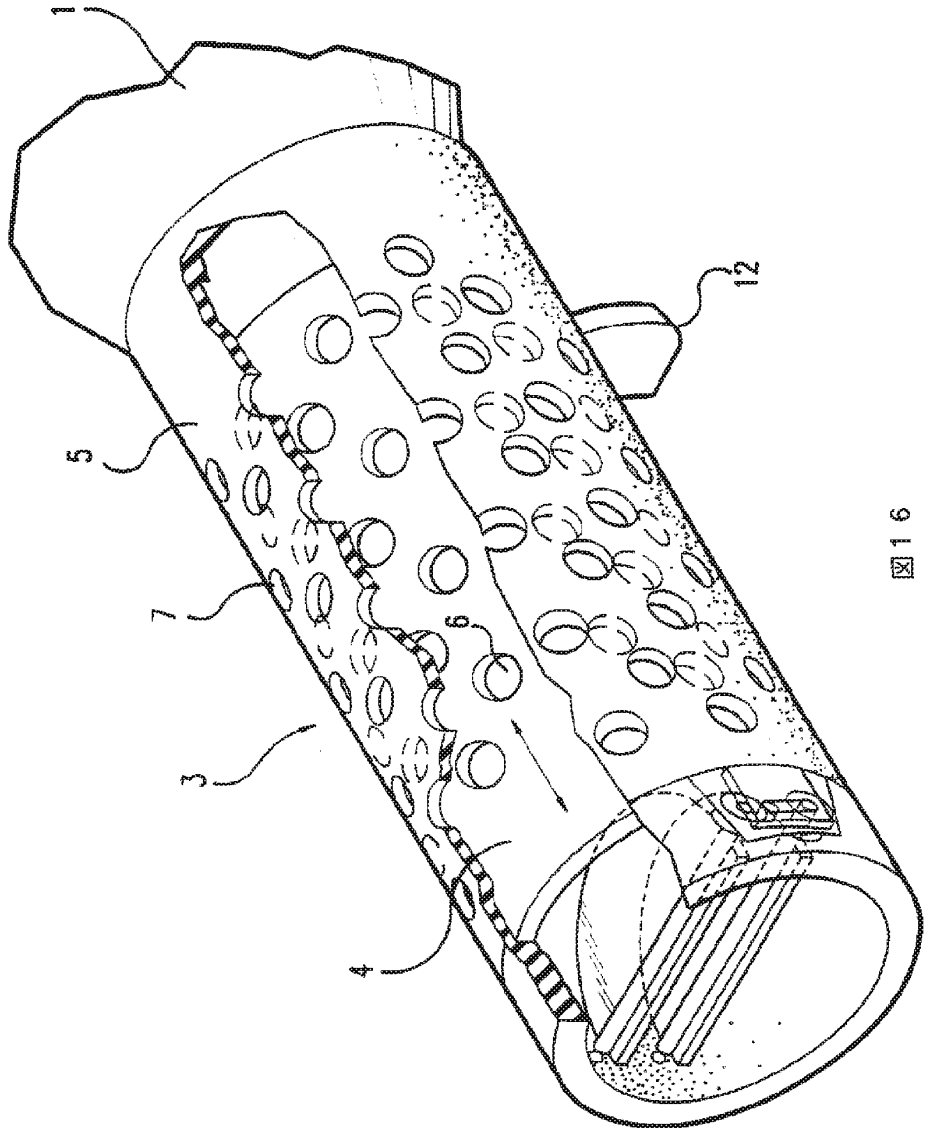


図１６

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【図１７】

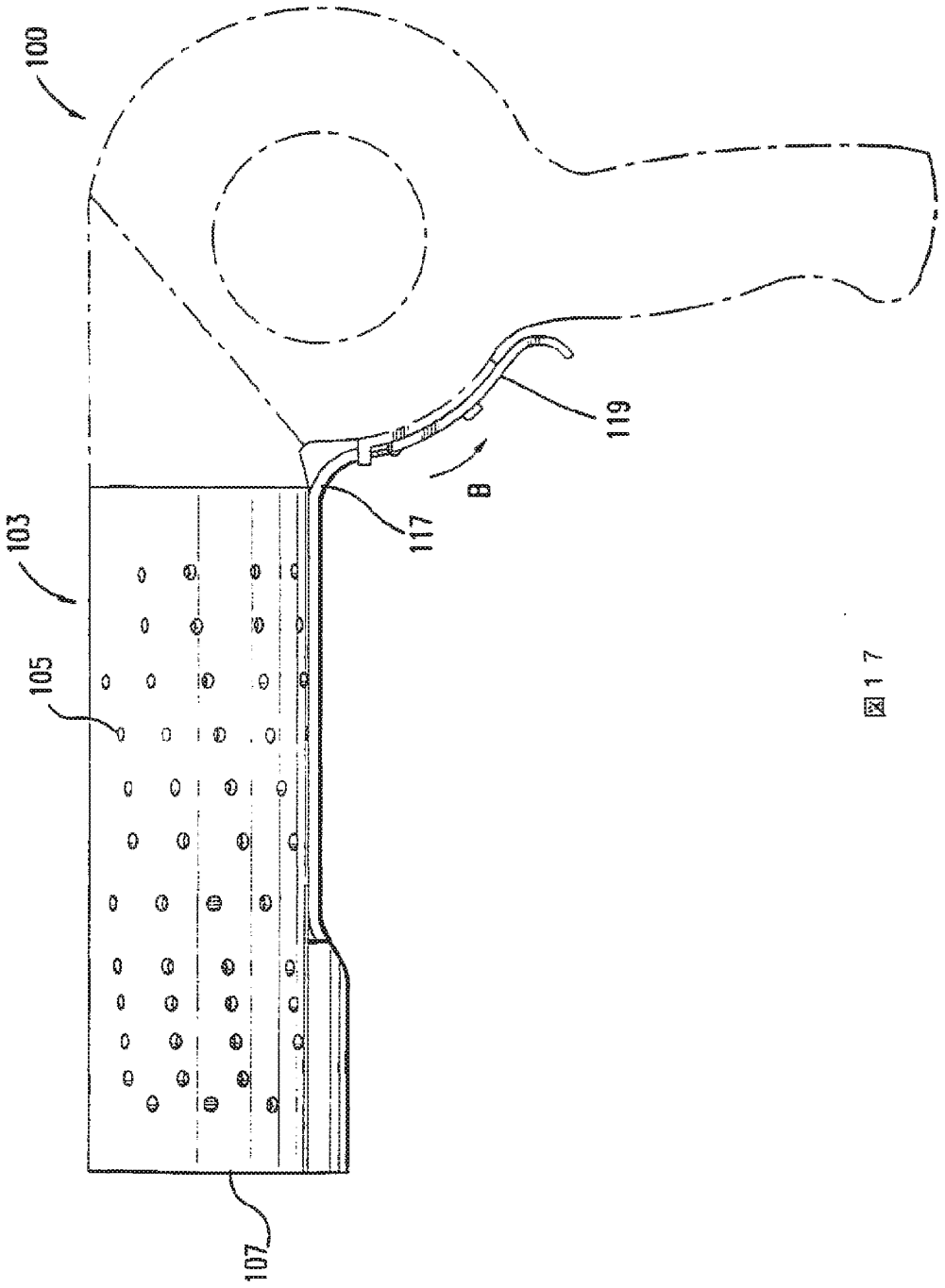


図１７

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【図１８】

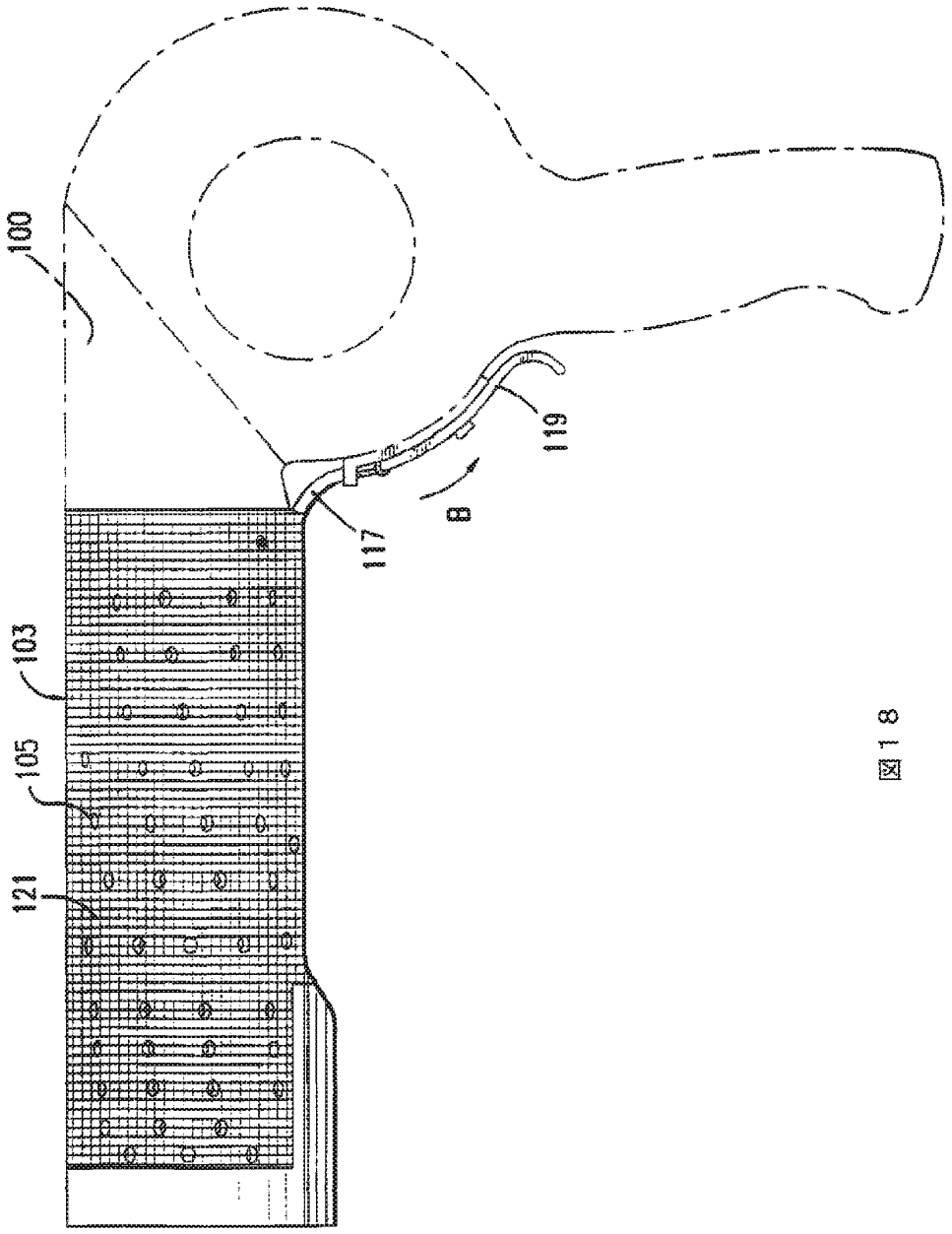


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【図１９】

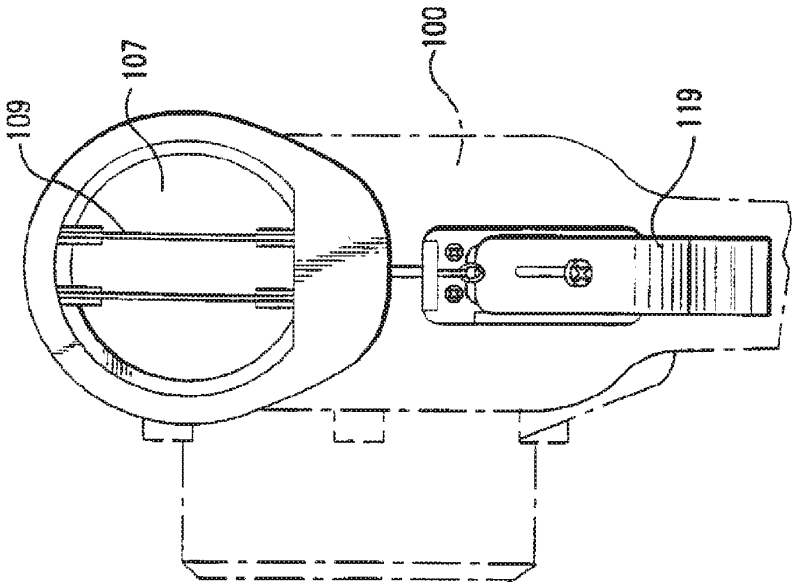


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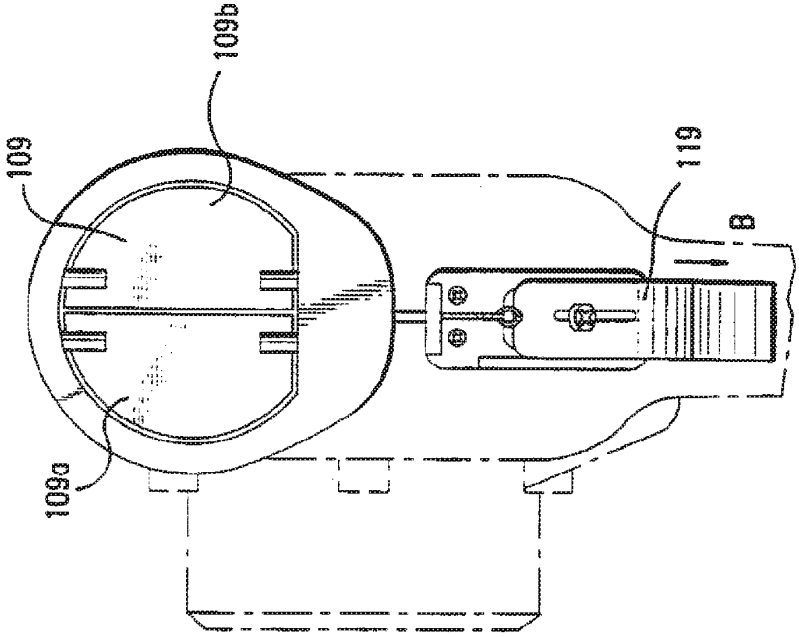


図２０

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【図２１】

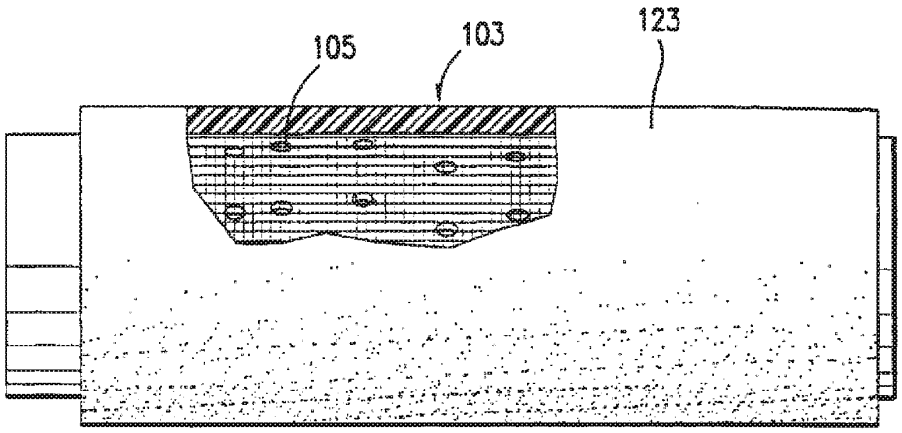


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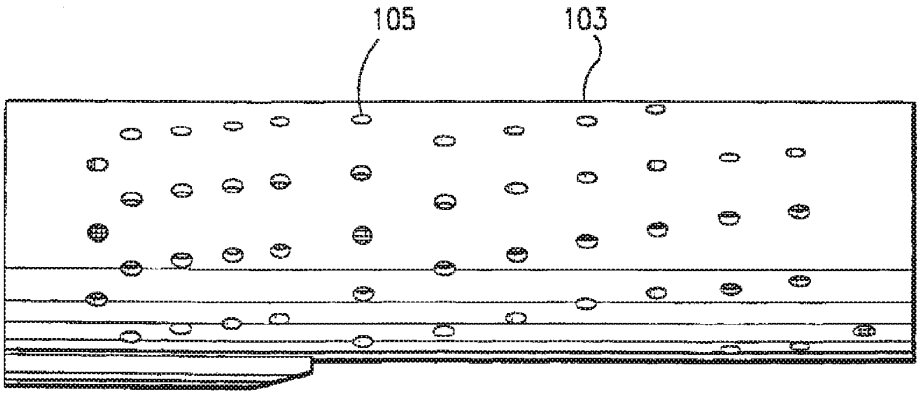


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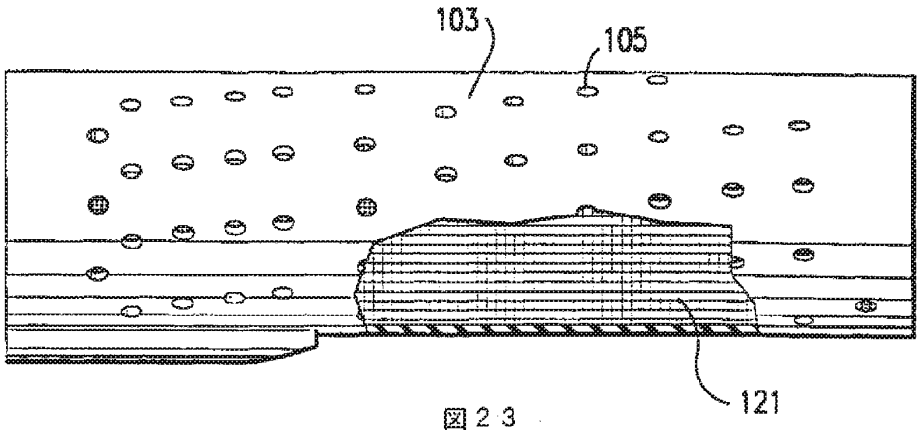


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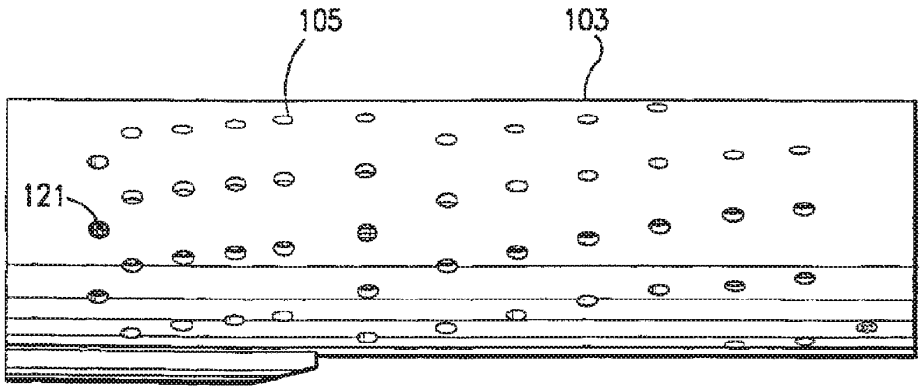


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【図２５】

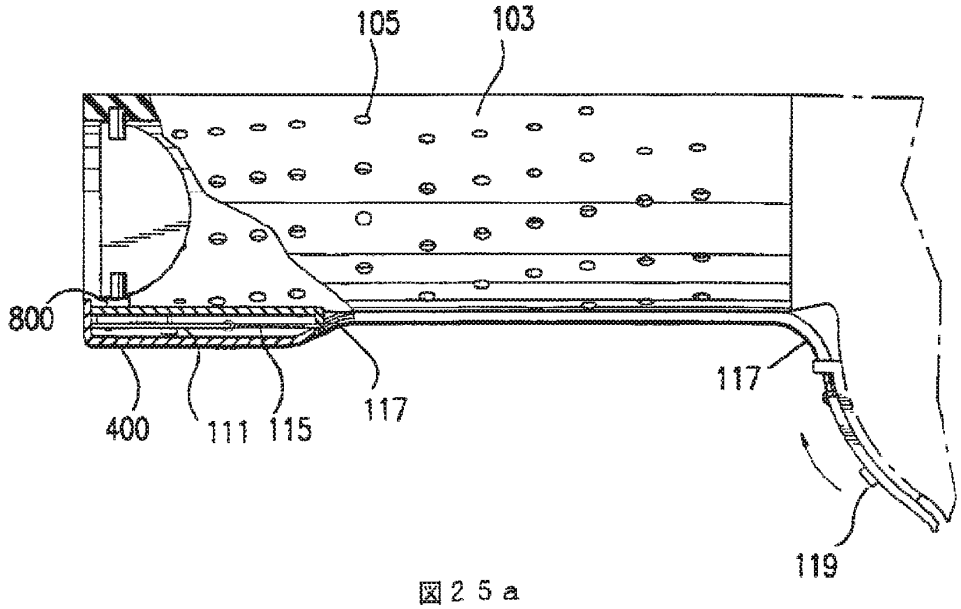


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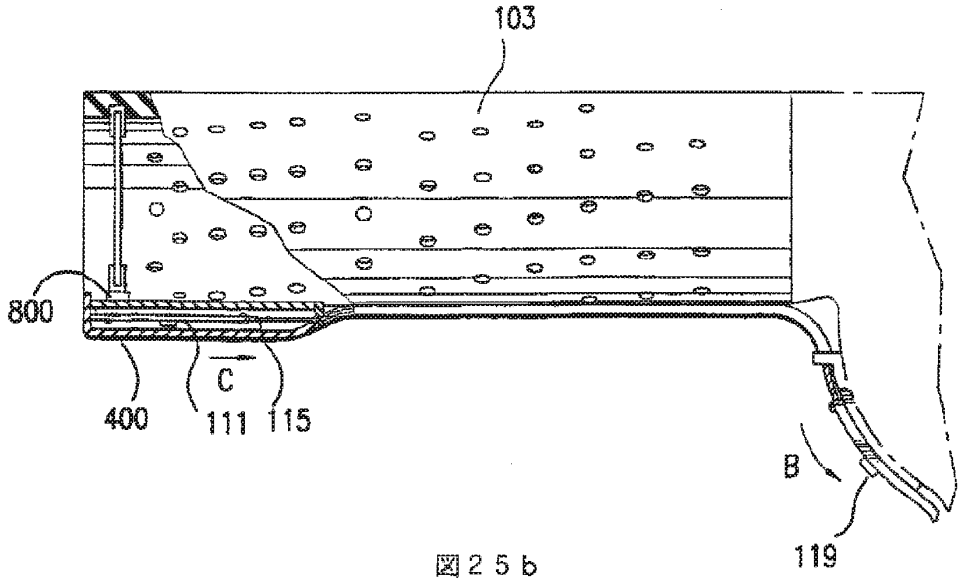


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【図２６】

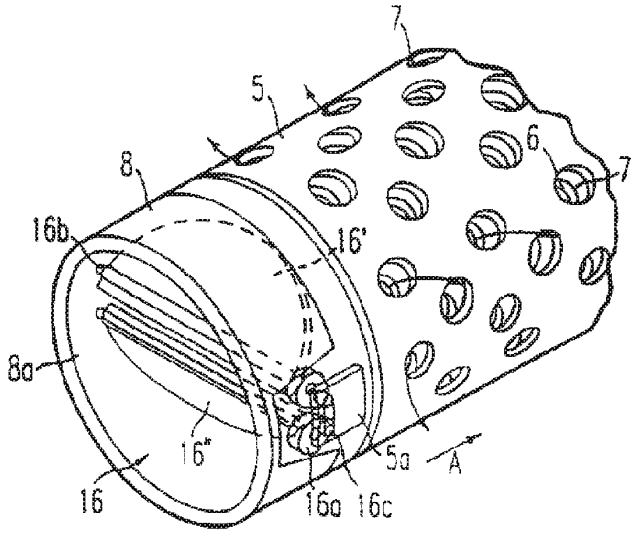


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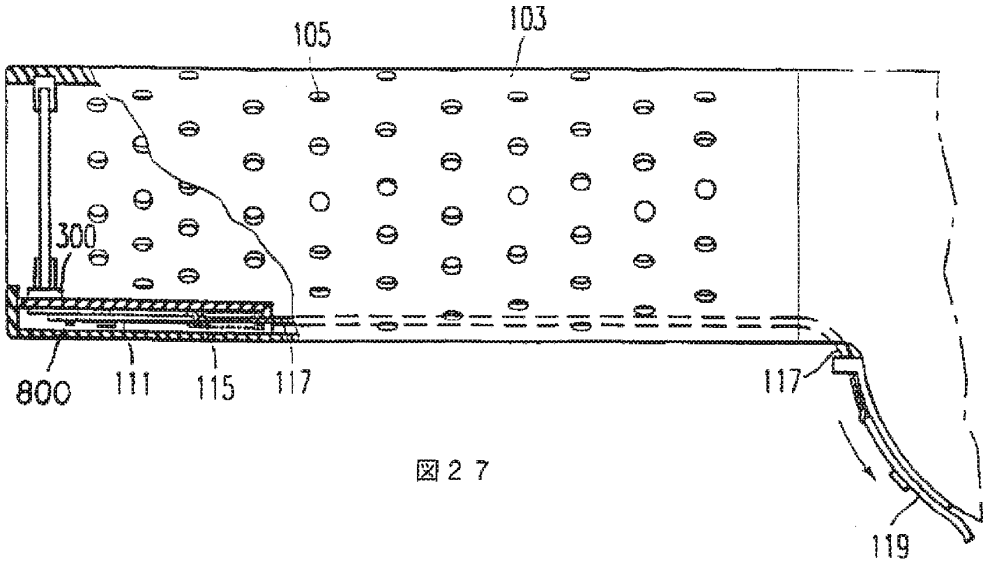


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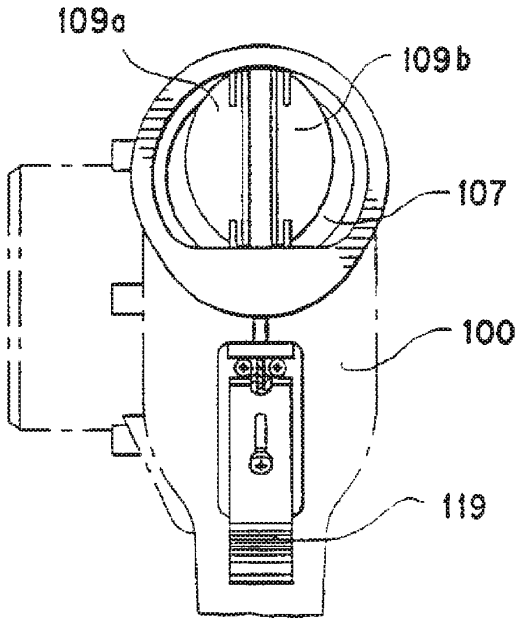


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Page 417 of 1998

【国際調査報告】

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/14834

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :A45D 20/00
US CL :34/96, 97
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
U.S. : 34/96, 97

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A, 4,097,722 (SOLER ET AL.) 27 JUNE 1978, see entire documents.	1-22
A	US,A, 4,218,608 (MARONEY) 19 AUGUST 1980, see entire document.	1-22
A	US,A, 4,232,454 (SPRINGER) 11 NOVEMBER 1980, see entire document.	1-22
A	US,A, 4,525,623 (DA SILVA) 25 JUNE 1985, see entire document.	1-22
A	US,A, 5,148,512 (OWENS) 15 SEPTEMBER 1992, see entire document.	1-29
X	US,A, 5,157,757 (McDOUGALL) 20 OCTOBER 1992, see entire document.	1, 16, 21

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
27 OCTOBER 1996

Date of mailing of the international search report
15 NOV 1996

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
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Washington, D.C. 20231
Facsimile No. (703) 305-3230

Authorized officer
DINNATIA DOSTER
Telephone No. (703) 308-7569

Form PCT/ISA/210 (second sheet)(July 1992)*

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Page 418 of 1998

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/14834

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A, 5,467,540 (BASTIEN) 21 NOVEMBER 1995, see entire document.	1-29
A, P	US,A, 5,507,103 (MERRITT) 16 APRIL 1996, see entire document.	1-22

Form PCT/ISA/210 (continuation of second sheet)(July 1992)*

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Page 419 of 1998

フロントページの続き

(81)指定国 EP(AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OA(BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), AP(KE, LS, MW, SD, SZ, UG), EA(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN

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Electronic Acknowledgement Receipt

EFS ID:	26536138
Application Number:	14656357
International Application Number:	
Confirmation Number:	9085
Title of Invention:	ATTACHMENT FOR A HAND HELD APPLIANCE
First Named Inventor/Applicant Name:	Alasdair Michael MACLAINE
Customer Number:	25227
Filer:	Christopher Elmose Gloria/Donna Bernecker
Filer Authorized By:	Christopher Elmose Gloria
Attorney Docket Number:	424662093300
Receipt Date:	03-AUG-2016
Filing Date:	12-MAR-2015
Time Stamp:	16:53:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IDS_424662093300.pdf	47039 2d6fb67e4c5d08233e1017c7e115d25f48cdba5e	yes	3

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	JP_57_196907.pdf	1252532 1a11474634e638fa1d9defd30a659f1b2103b712	no	8
Warnings:					
Information:					
3	Foreign Reference	GB_2_100_981.pdf	2257148 85c41425452def6fc328260ef5b611696fece3ba	no	15
Warnings:					
Information:					
4	Foreign Reference	JP_64_29208.pdf	277053 a6a6f42b53679aa72671c25ea9ca0b8ee7dfea34	no	8
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5	Foreign Reference	JP_2000_516483.pdf	852783 bc9acc0010a00462c166f78da168ae3506f4a4f4	no	46
Warnings:					
Information:					
		Total Files Size (in bytes):	4686555		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: August 3, 2016
Electronic Signature for Donna Bernecker: /dbernecker/

Patent
Docket No. 424662093300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 | Confirmation No.: 9085

Filed: March 12, 2015 | Art Unit: 3776

For: ATTACHMENT FOR A HAND HELD APPLIANCE | Examiner: Robyn K. Doan

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & § 1.98

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, Applicant submits for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of the foreign documents are submitted herewith. The Examiner is requested to make these documents of record.

Concerning a brief explanation of relevancy of the teachings of the cited foreign prior art references to the present invention pursuant to 37 CFR 1.98(a)(3)(i), Applicant indicates on the attached Form PTO/SB/08a/b that JP 57-196907 corresponds to GB 2 100 981 (GB counterpart) and JP 2000-516483 corresponds to US 5,661,910 (US counterpart).

va-478481

This Information Disclosure Statement is submitted within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required.

Applicant would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

The information contained in this Information Disclosure Statement under 37 C.F.R. § 1.97 and § 1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. § 1.17 (p)) is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petition and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing (424662093300). However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: August 3, 2016

Respectfully submitted,

Electronic signature: /christopher gloria/
Christopher Gloria
Registration No.: 71,907
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
(703) 760-7389

va-478481

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/656,357	03/12/2015	Alasdair Michael MACLAINE	424662093300	9085

25227 7590 09/16/2016

MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 400
MCLEAN, VA 22102

EXAMINER
GILL, JENNIFER FRANCES

ART UNIT	PAPER NUMBER
3776	

NOTIFICATION DATE	DELIVERY MODE
09/16/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

EOfficeVA@mofo.com
PatentDocket@mofo.com

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Office Action Summary	Application No. 14/656,357	Applicant(s) MACLAINE, ALASDAIR MICHAEL	
	Examiner JENNIFER GILL	Art Unit 3776	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/12/15*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-35* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) *1-35* are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Election/Restrictions

This application contains claims directed to the following patentably distinct species

Species I. Claims 1-16 drawn to a hair curler classified in CPC A45D2/36.

If electing Species I, then within Species I, applicant must elect one of the following sub-species:

Sub-species IA. Cylindrical mandrel curler with a series of longitudinal plates extending parallel to one another (Figs 3-8 & 15-16)

Sub-species IB. Multi-sided brush curler (Figs 10-13)

If electing Species II, then within Species II, applicant must elect one of the following sub-species:

Species II. Claims 17-35 drawn to a hair curling brush with internal heated air source and fan classified in CPC A45D20/50.

Sub-species IIA. Curling brush with a heated cylindrical mandrel attachment having a series of longitudinal plates extending parallel to one another and joined to a handle carrying a heat source

Sub-species IIB. Multi-sided brush attachment joined to a handle carrying a heat source

The species are independent or distinct because Species II requires a source of heated air and a handle with electrical connections and a power source, while Species I requires a hollow curler that attaches to some other source of heat or can be used in the absence of heat for styling hair. The devices are classified in different areas of the CPC and USPC.

In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, and a single corresponding sub-species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims appear to be generic to the disclosed Species or corresponding sub-species.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

a. The inventions have acquired a separate status in the art in view of their different classification;
b. The inventions have acquire a separate status in the art due to their recognized divergent subject matter;
c. The inventions require a different field of search (for example, searching search queries);

d. The prior art applicable to one invention would not likely be applicable to another invention;

e. The inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first and/or second paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either

instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

No telephone call was made to request an oral election to the above restriction requirement, but did not result in an election being made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER GILL whose telephone number is (571)270-1797. The examiner can normally be reached on Tuesday thru Friday 10:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Todd Manahan can be reached on 571-272-4713. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G./
Examiner, Art Unit 3776

/RACHEL STEITZ/
Primary Examiner, Art Unit 3776

I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4).

Dated: November 1, 2016
Electronic Signature for Donna Bernecker: /dbernecker/

Docket No.: 424662093300
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Alasdair Michael MACLAINE	
Application No.: 14/656,357	Confirmation No.: 9085
Filed: March 12, 2015	Art Unit: 3776
For: ATTACHMENT FOR A HAND HELD APPLIANCE	Examiner: Jennifer Frances Gill

RESPONSE TO ELECTION OF SPECIES REQUIREMENT

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Action dated September 16, 2016, Applicant elects to prosecute Species I, directed to an attachment, and sub-species 1A, directed to Figures 3-8, 15 and 16, *without traverse*. Claims 1-16 read on the elected sub-species. The Examiner states that no claim is generic. Applicants respectfully disagree. Claim 1 is generic since all the other claims require each of the limitations of claim 1. (MPEP 806.04(d).)

va-483461

In the event that the Patent and Trademark Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing **424662093300**.

Dated: November 1, 2016

Respectfully submitted,

Electronic signature: /christopher gloria/
Christopher Gloria
Registration No. 71,907
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
Telephone: (703) 760-7389

I hereby certify that this paper is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: November 1, 2016
Electronic Signature for Donna Bernecker: /dbernecker/

Patent
Docket No. 424662093300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Alasdair Michael MACLAINE

Application No.: 14/656,357 | Confirmation No.: 9085

Filed: March 12, 2015 | Art Unit: 3776

For: ATTACHMENT FOR A HAND HELD APPLIANCE | Examiner: Jennifer F. Gill

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & § 1.98

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, Applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of the foreign documents are submitted herewith. The Examiner is requested to make these documents of record.

This Information Disclosure Statement is submitted within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required.

Applicants would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

va-483447

The information contained in this Information Disclosure Statement under 37 C.F.R. § 1.97 and § 1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. § 1.17 (p)) is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petition and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing (424662093300). However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: November 1, 2016

Respectfully submitted,

Electronic signature: /christopher gloria/
Christopher Gloria
Registration No.: 71,907
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
(703) 760-7389

va-483447

ALTERNATIVE TO PTO/SB/08A/B
(Based on PTO 08-08 version)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	14/656,357
Filing Date	March 12, 2015
First Named Inventor	Alasdair Michael MACLAINE
Art Unit	3776
Examiner Name	J. F. Gill
Attorney Docket Number	424662093300

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	US-3,814,898	06-04-1974	Levine	
	2.	US-2007/0137060	06-21-2007	Woodson	
	3.	US-2011/0198421	08-18-2011	Yoe	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	4.	GB-725,095	03-02-1955	Michele		
	5.	GB-1 295 924	11-08-1972	Sperry Rand Corporation		
	6.	DE-26 18 819	11-17-1977	Dov Z. GLUCKSMAN	Machine Translation	x
	7.	JP-6-7217	01-18-1994	Matsushita Electric Works Ltd. (Eiji TSUJI)	Machine Translation	x
	8.	JP-10-71019	03-17-1998	Toshiba Home Tech KK (Hiroshi YAMAMOTO et al.)	Machine Translation	x
	9.	JP-10-179238	07-07-1998	Matsushita Electric Works Ltd. (Kenji KAMATA et al.)	Machine Translation	x
	10.	JP-2004-225705	08-12-2004	Hitachi Maxell (Kenji ENDO)	Machine Translation	x
	11.	JP-2007-105144	04-26-2007	Hitachi Maxell (Takenori OKAMURA et al.)	Machine Translation	x
	12.	CN-201691269	01-05-2011	You HANXIAN	Machine Translation	x
	13.	KR-10-2012-0095206	08-28-2012	Seung-Soo LEE	Machine Translation	x
	14.	CN-203106087	08-07-2013	Zhejiang Fine & Bruidge Electrics Co. Ltd. (Yanfen ZHOU)	Machine Translation	x
	15.	GB-2524304	09-23-2015	Dyson Technology Limited (Alasdair Michael MACLAINE)		
	16.	GB-2526049	11-18-2015	Dyson Technology Limited (Alasdair Michael MACLAINE et al.)		
	17.	GB-2527834	01-06-2016	Dyson Technology Limited (Emma Victoria DORAN)		

Examiner Signature		Date Considered	

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

va-483446

PATENT SPECIFICATION

725,095

Date of Application and filing Complete Specification: Aug. 17, 1953. No. 22566/53.

Application made in Italy on June 19, 1953.

Complete Specification Published: March 2, 1955.

Index at acceptance:—Class 131, C1.

COMPLETE SPECIFICATION

An Improved Hair Waving Comb

I, FASCIANO MICHELE, an Italian Subject, of Corso Vittorio Emanuele, 27, Campobasso, Italy, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to combs of the kind wherein the teeth are adapted to be heated for hair waving purposes.

Hitherto in such combs the teeth have been either steam or electrically heated with a result that over-heating of the whole comb has taken place tending to cause injury to the scalp and inconvenience to the hairdresser operating the comb.

The object of the present invention is to provide a hair waving comb of the kind referred to whereby the above mentioned disadvantages are obviated inasmuch as the comb is adapted for heating by hot air and the application of heat confined as far as possible to the base portions of the comb teeth in order to heat the latter.

According to this invention a hair waving comb of the kind referred to is characterised by a tubular back member adapted at one end for connection to a source of hot air and having at least one vent hole at the other end whilst the comb teeth have their base portions mounted within the tubular back member so that the teeth protrude from the latter, said base portions of the teeth having heat applied thereto by hot air when the latter is introduced into the tubular back member in order to heat the teeth, the air subsequently escaping from the vent hole.

In order that the invention may be clearly understood and readily carried into practical effect reference is made in the following description to the accompanying drawings, in which:—

Fig. 1 is an elevation of a hair waving comb according to this invention; and

Fig. 2 is an elevation in axial plane section of the comb shown in Fig. 1.

[*Price* 2/8]

Referring to the drawings, the comb comprises a tubular back member 1 which tube has a hemispherical forward end provided with a vent hole 2 whilst a longitudinal slot 3 is also formed in the tube 1 through which slot the teeth 4 protrude, so that a rectangular aperture is left in the tube 1 between each pair of teeth. The teeth have their bases welded or otherwise secured to the inner wall of the tube 1 opposite the slot 3 so that the base portions of the teeth 4 are mounted within the tube 1.

The rear end of the tube 1 has threaded thereon a deflector disc 5 in advance of an enlarged tubular connector member 6 for connecting the comb to a source of hot air such as the supply tube of a hair dryer of the well known electric type. The connector 6 also has a hemispherical head portion 7 provided with a number of perforations 8 for the escape of excess hot air which latter is deflected and dissipated by the disc 5 and thus prevented from reaching to any appreciable extent the head of hair being waved.

The connector 6 is conveniently provided with a hand grip for the hairdresser in the form of a ring 9 of heat insulating material such as wood or a suitably synthetic resin, the ring being secured fast about the connector 6 and knurled at its outer periphery at 10.

In order to confine the application of heat to the base portions of the teeth 4, the tube 1 is shrouded by a sheath 11 of heat insulating material such as a suitable synthetic resin which sheath has a vent hole 12 corresponding to the vent hole 2 in the tube 1 and similarly a longitudinal slot 13 registering with the slot 3.

For the purposes of further protecting the scalp from excess heat a collar 14 of heat insulating material is preferably provided to form a shield in front of the disc 5 which collar 14 is shown threaded on the rear end of the sheath 11.

In use the comb is connected to a supply

Price 5s. 0d.

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pipe of an electric hair dryer by the connector 6 whereby hot air passes along the tube 1 to effect the application of heat to the base portions of the teeth 4 therein in order to heat said teeth and finally escapes at the vent holes 2, 12. The hair to be waved is then combed by the heated teeth and as will be apparent from the construction herein described the heat insulation provided and the provision for disposing of excess hot air ensures prolonged use of the comb without discomfiture to the person whose hair is being waved or to the hairdresser.

Provided that the basic conception of the present invention is maintained, the embodiments illustrated in the drawings and the particulars hereinabove described, in respect of the practical application, may be subject to modifications within the scope of the appended claims.

What I claim is:—

1. A hair waving comb of the kind referred to characterised by a tubular back member adapted at one end for connection to a source of hot air and having at least one vent hole at the other end whilst the comb teeth have their base portions mounted within the tubular back member so that the teeth protrude from the latter, said base portions of the teeth having heat applied thereto by hot air when the latter is introduced into the tubular back member in order to heat the teeth, the air subsequently escaping from the vent hole.

2. A hair waving comb according to Claim 1, wherein the tubular back member has a longitudinal slot therein through which the comb teeth protrude.

3. A hair waving comb according to either of the preceding claims, wherein the tubular back member is exteriorly heat insulated.

4. A hair waving comb according to Claim 1, 2 or 3, wherein the tubular back member is shrouded with a sheath of heat insulating material except at the said vent hole and longitudinal slot.

5. A hair waving comb according to any of the preceding claims wherein the bases of the comb teeth are welded or otherwise secured to the inner wall of the tubular back member.

6. A hair waving comb according to any of the preceding claims, wherein connection of the tubular back member to a source of hot air is effected by means of an enlarged tubular part which latter is perforated at its forward end for the escape of excess hot air whilst a deflector is mounted about the tubular back member and positioned closely in front of the perforation in the said enlarged tubular part for deflecting or dissipating hot air escaping from the latter.

7. A hair waving comb according to Claim 6, wherein the said enlarged tubular part forms a connector to the tubular back member for connecting a source of hot air to the latter, said connector having a hand grip of heat insulating material mounted about same.

8. A hair waving comb according to Claim 6, wherein a shield of heat insulating material is mounted about the tubular back member closely in front of the deflector.

9. A hair waving comb of the kind referred to substantially as herein described and shown in the accompanying drawings.

T. FLETCHER WILSON,
Chartered Patent Agent,
3, Queen's Road, Coventry.
Agent for the Applicant.

Printed for Her Majesty's Stationery Office by Wickes & Andrews, Ltd., E.C.4. 684/2.—1955.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

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Page 439 of 1998

725,095 COMPLETE SPECIFICATION
1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

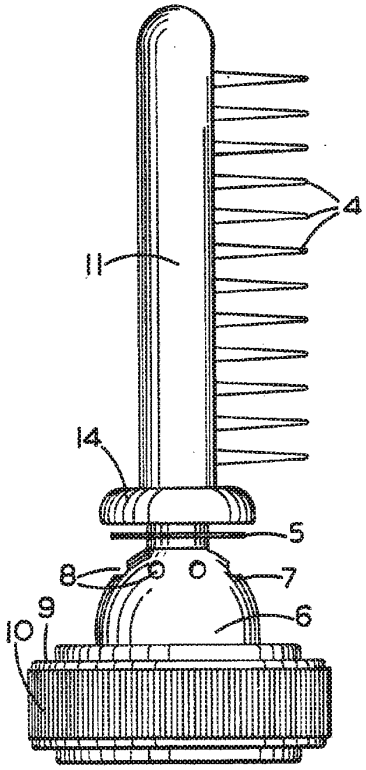


FIG. 1.

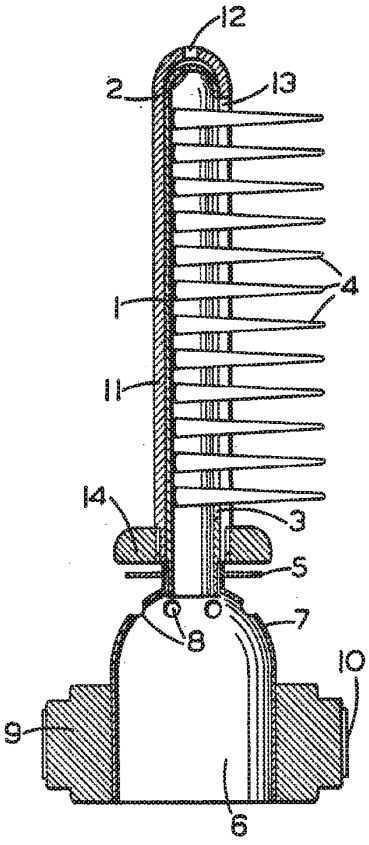


FIG. 2.

PATENT SPECIFICATION (11) 1 295 924

1295924

DRAWINGS ATTACHED

(21) Application No. 43774/70 (22) Filed 14 Sept. 1970

(31) Convention Application No. 865 873 (32) Filed 13 Oct. 1969 in

(33) United States of America (US)

(45) Complete Specification published 8 Nov. 1972

(51) International Classification A45D 20/00

(52) Index at acceptance
A4V 14A5B
A5R 79D

(54) HAIR STYLING DEVICE

(71) We, SPERRY RAND CORPORATION, a corporation organized and existing under the laws of the State of Delaware, of 1290 Avenue of The Americas, New York, New York 10019, United States of America, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to new and useful improvements in hair styling and drying devices and in particular to hair curling attachments therefor.

Hair styling instruments such as portable hand-held hair drying devices provided with means for discharging heated air outwardly thereof through attachments such as hair combs, brushes and hair dryer hoods are well known. Certain hair drying devices as used by women in the home for example are equipped with a flexible hose hot air conduit detachably connected to a hair dryer hood and are provided with attachments for connection to the dryer hose when the hood is detached for dispersing the heated air to the interior of hair roller. In use of the latter type attachments, the user first winds a damp lock of hair about the outer surface of a hollow open-ended hair roller. The end of the hair dryer hose is adapted to be brought into communication with or otherwise coupled to the open end of the hair roller and heated air is dispersed into the interior of the roller and thence outwardly thereof to the exterior of the roller through slots in the roller wall. In this manner the lock of hair wound on the roller is dried and a tight curl is formed when the roller is removed from the hair.

Inconveniences are encountered in the use of these known hand manipulated devices. In a single operation of setting hair, a woman will necessarily use and place a number of hair rollers in the hair at one time, with the size and number of rollers varying with the particular needs of the user. It is necessary in known devices to attach or locate the heated air output means such as the end of the dryer hose with the hair roller either prior to or when the roller is in the hair. The manipulation of the hose and coupling attachment about the head results in a tiresome and cumbersome operation. Further even though the user might sit before a mirror time is unnecessarily lost and annoyance caused by the known means in the process of coupling and locating the heated air output means with the entry end of the hair roller.

The present device contemplates a novel hair curling device. Accordingly, the invention consists in a hair curler device comprising a hollow cylindrical base portion and a conical probe portion, the said base portion having an inlet for heated air, the probe portion having a closed end at the extremity of the taper thereof and longitudinal slots extending from the said closed end rearwards into the interior of the base portion, whereby upon the probe portion being inserted into the end of a hair roller heated air may be applied to the hair roller from the said longitudinal slots for use in the treatment of hair.

In order that the invention may be clearly understood an embodiment thereof will now be described with reference to the accompanying drawings:—

In the drawings:—

FIG. 1 is a side elevational view of a portable hair styling and dryer device and to which device is attached one embodiment of a novel hair curling attachment according to the present invention.

FIG. 2 is an enlarged transverse cross-sectional view taken on the line 2—2 of FIG. 3 of the hair curler attachment showing the interior thereof and a fragmentary portion of the forward end of the hair styling and dryer device.

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a perspective view of the hair curler attachment.

FIG. 5 is a sectional view of hollow hair roller and having inserted therein the hair curler attachment, and

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FIG. 6 is a sectional view taken on the line 6—6 of FIG. 5.

Referring now to the drawing for a more detailed description of the present invention and more particularly to FIG. 1, a novel hair curling device made according thereto is generally indicated by the reference numeral 10 and which device 10 is shown in FIG. 1 as connected to one end of a portable hand-held hair styling and drying device whose housing is generally indicated by the reference numeral 11.

The hair dryer device of FIG. 1 is of a known type and includes within housing 11 thereof a motor 15, a fan 16, and a heating element 17, diagrammatically shown in FIG. 1. The forward end of housing 11 is provided with a socket 19 (FIG. 2). Socket 19 surrounds air discharge opening 20 in housing 11. Hair dryer devices of this type usually include a number of attachments adapted to be mounted on housing 11 in socket 19 such as brushes or combs (not shown) and which items when secured to housing 11 provide an extension thereof for styling and drying the user's hair. With appliance cord 21 (partially shown in FIG. 1) connected to a suitable electrical outlet, motor 15 and fan 16 are operated to dispense heated air generated by hearing element 17 outwardly through opening 20 onto the brush or comb (not shown).

As mentioned it is an object of the present invention to provide a novel attachment for curling hair. To this end hair curler device 10 is shown attached to hair dryer housing 11. Attachment 10 includes an elongated hollow open-ended casing 22 made of a suitable plastics material. Casing 22 includes an enlarged tubular shaped base portion 23 (FIG. 2 and 4) which conforms in configuration to the forward end of hair dryer housing 11 and is provided with an axial passage 20a communicating with opening 20 in housing 11. An elongated conical-shaped probe portion 24 extends from base 23 and is provided with a plurality of elongated vent slots 25 extending from base 23 and separated from each other by ribs 26 (FIGS. 3 and 4). Slots 25 terminate adjacent closed end 27 (FIG. 4) of conical portion 24.

A plug portion 29 of reduced diameter to base 23 projects from base 23. A pair of locking slots 30 (FIG. 3) are formed in plug 29 and each of which slots 30 (FIGS. 3 and 4) adapted for a twist locking engagement with a corresponding lug 31 formed on the wall of socket portion 19 of housing 11. In this manner attachment 10 is securely and easily mounted on housing 11 and can be readily substituted for other attachments as desired. A metal collar 33 is press-fitted into the interior of casing 22 in plug portion 29 and reinforces plug 29 to assure a tight fit between attachment 10 and the hair drying housing 11.

In FIGS. 5 and 6 a hair roller 35 of a usual type is shown and which roller 35 comprises a tubular-shaped member having a base 36 and an open end portion 37. A plurality of openings 38 are provided in the walls of roller 35. In use, hair roller 35 supports a damp strand of hair wound about the outer surface thereof as illustrated in FIGS. 5 and 6 and is secured in position on the user's head in any suitable manner such as by a suitable clip member (not shown).

In utilization of the novel hair curler attachment 10 described above with roller 35, a woman will set her hair by placing a plurality of rollers 35 in her hair at different locations in accordance with the desired hair setting. Attachment 10 is secured to hair dryer housing 11 in the manner described. Upon operation of the hair dryer heated air is dispersed outwardly through opening 20 in housing 11 to the interior of attachment casing 22 through passage 20a. The user gripping housing 11 in her hand manipulates probe portion 24 of attachment 10 into and out of the open ends 37 of hair rollers 35 while the same is on the user's head as illustrated with respect to one such roller 35 in FIG. 5. The heated air moves outwardly of probe 24 through to venting slots 25 and to the exterior surface of roller 35 through openings 38 in roller 35 to dry and set the hair. The length of time required to produce a curl varies with the hair texture and degree of wetness of the hair. The probe portion 24 of casing 22 is readily moved from one hair roller to the other with a minimum amount of effort. Conical-shaped probe 24 provides ready means for locating and entering the open end of the hair roller. Engagement of base 23 of casing 22 with base 39 (FIG. 5) of roller 35 limits the inward movement of conical portion. The ends of slots 26 indicated at 40 in FIG. 5 extend into base 23 whereby slots 26 are not completely covered by roller 35 when a probe 24 is inserted therein. Gentle rotative movement of probe 24 in this engaged position about the interior of the roller 35 effects a turbulence of heated air as indicated by the arrows in FIG. 6 which hastens the drying of the hair on the outer surface of the roller.

It is apparent from the foregoing that the novel hair curling device has many advantages in use. One advantage is that a probe is provided for ready manipulation into and out of hair rollers whereby the same may be conveniently used with a number of hair rollers in the user's hair. In addition, the elongated vent slot arrangement provides for an efficient and effective dispersement of the

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heated air into the interior of hair roller to produce curling and drying of the hair in a minimum amount of time.

Although one embodiment of the present invention has been illustrated and described in detail, it is to be expressly understood that the invention is not limited thereto.

WHAT WE CLAIM IS:—

1. A hair curler device comprising a hollow cylindrical base portion and a conical probe portion, the said base portion having an inlet for heated air, the probe portion having a closed end at the extremity of the taper thereof and longitudinal slots extending from the said closed end rearwards into the interior of the base portion, whereby upon the probe portion being inserted into the end of a hair roller heated air may be applied to the hair roller from the said longitudinal slots for use in the treatment of hair.

2. A hair curler device as claimed in claim 1 provided with means to limit the depth of penetration thereof into a hair roller and wherein the rearward end of the longitudinal slots extends beyond the said limiting means to be positioned outside the said roller when the depth of penetration is determined by the limiting means.

3. A hair curler device as claimed in claim 2 wherein the said limiting means comprises peripheral wall portions of the said hollow cylindrical base portion.

4. A hair curler device as claimed in any of the preceding claims in combination with a hand-held hair styler detachably secured to said device said styler having means for supplying heated air and an outlet for said heated air adapted to be connected to said hair curler device.

5. A hair curler device and hair styler as claimed in claim 4 wherein the means for securing the hair styler to the hair curler device include ready releasable latches having complementary portions on the casing of the device and the housing of the hair styler.

6. A hair curler device as claimed in claim 1 in combination with a hand-held hair styler detachably secured to said device wherein a plug on the base of the hair curler device is adapted for insertion into an outlet orifice of the hair styler, latching means are provided in the form of locking slots and lugs on the plug and adjacent surfaces of the hair styler respectively, and a plurality of ribs project outwardly from the end of the said base and taper inwardly towards the apex of the said casing and define therebetween the said elongated slots.

7. A hair curler device substantially as hereinbefore described and as shown in the accompanying drawings.

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1295924 COMPLETE SPECIFICATION
1 SHEET This drawing is a reproduction of the Original on a reduced scale

Fig. 1.

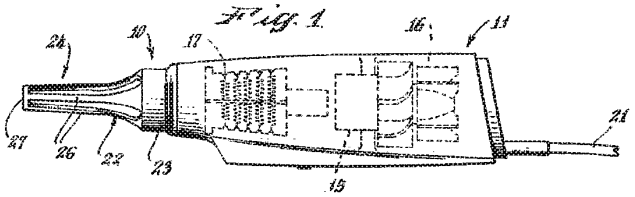


Fig. 2.

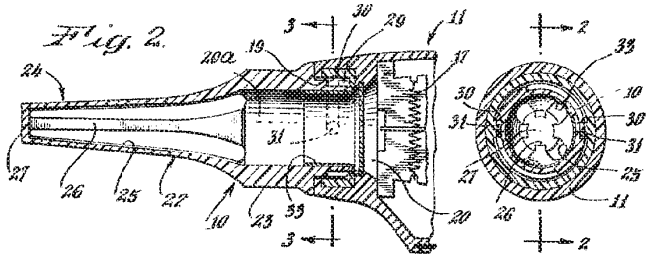


Fig. 3.

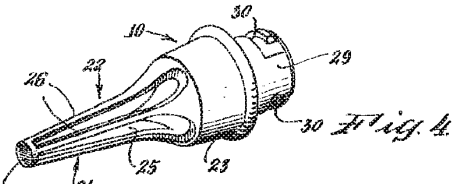


Fig. 4.

Fig. 5.

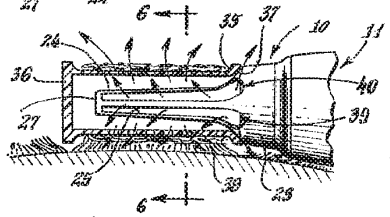
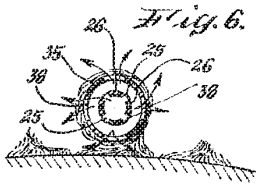


Fig. 6.



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DESCRIPTION DE2618819

Electric Haartrockengerät1?

hat according to the invention hair drier is substantially an electrical device for generating a hot-air stream, said apparatus comprising an axial fan motor, which is housed in the end part of a substantially cylindrical housing.

This engine fan is held in the housing by means of curved guide vanes which are located between the outer surface of the motor and the inner surface of the housing and connecting the two surfaces.

Further, the electric hair drier or an electric heating element, which is located in the cylindrical or tapered front part of the housing.

This electric heating element consists of a winding of a wound on a support tape-shaped l.fiderstandes, wherein the flat side of all windings form the outer surface of a cylinder, a prism or a cone or truncated pyramid, which is parallel to the air flow, in turn, the housing inner wall follows.

Each turn is separated from the next one by a gap.

Furthermore, additional devices can be attached to the electric hair dryer, and although at the exit end of the air flow yet, zzie example, a brush with a star-shaped cross-section a Föhnkamm, a round or slit and the like.

Many electric hairdryer, particularly for domestic use, have a pistol-shaped housing, from the mouth of the hot air is blown out.

The back of the grip of the pistol-shaped housing is usually an air blower, while the electric heating element is housed in the tube of the gun-shaped housing.

The electric power is supplied to these devices through an electric cable and a switch, which are also arranged in the handle of the gun-shaped housing.

It is also known that the hot air outlet of such hair dryers to fit a cylindrical or cone-shaped brush that can be inserted between the strands of hair to be treated.

These brushes open up the possibility to accelerate the drying of the hair and at the same time to brush the hair or to smooth ripples.

To this end, brush and hair drier become wavy moved.

In this type of hair drying apparatus, the brush is usually removable so that the device can be used depending on the needs and desires, with or without brush.

At Haartrocknernv have been developed ursprünglichfllr a non-disabled air flow from the mouth, thus the flow resistance is increased and decreased the amount of air supplied by the drying unit.

The original amount of air can be reached in such cases, only again if larger fans and electric motors are used in hair dryers, in turn requiring greater U44 heavier body and thus make the dryer clumsy and unwieldy.

Other devices that are equipped with combs or sausages and have a substantially elongated round shape, can be equipped on the basis of their shape with hot air blower units of low efficiency and performance.

It follows as a task, an electric hair dryer apparatus comprising means for attaching peripheral devices, such as brushing, combing and develop the like, where the airflow only a small resistance is given and the hair dryer in a convenient-to-use housing, with a small fan and a small engine, capable of promoting a greater quantity of air.

There was an electric hair drier found which is composed of: a housing in the form of a hollow cylinder or valve plug or a combination of the openings at its rearward end air inlet and at its other end a circular molding of both

Comprises air outlet opening, a blower device> consisting of a

Electric motor with a diameter which is smaller than the inner diameter of the housing and a motor shaft mounted on the axial

Impeller which is coaxial with the housing in the

Vicinity of the air inlet openings is arranged, a cylindrical or cone-shaped electrical heating element, which in the front part of the coaxial with the housing in the space between

Fan means and the outlet opening is arranged attached and the radially up to a line extending from a fixed winding support, made of a nonconductive and heat-resistant material in the form of at least four longitudinal ribs extending from a joint line along the housing axis, the substantially parallel and in particular distance from the housing wall and extending a strip-shaped resistor, which is wound in coils on said winding support on the outer edges of the radial ribs, whereby the strip surface is directed substantially parallel to the housing wall and to the air flow.

The fan means comprises an electric motor, which is provided at its outer side with fixed, curved

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air guide surfaces, which are attached either directly or indirectly on the motor housing and hold the motor in the housing of the electric hair dryer.

On the axis of the motor axial fan is fixed, which is located in the immediate vicinity of the air inlet openings.

It is particularly advantageous embodiment of the inventive hair dryer machine whose outer casing has the shape of a long coated truncated cone which is closed at its higher end by a rounded cap.

This cap has an air inlet opening to a plurality of slots, which may be disposed concentrically or radially.

In this cap, particularly in the non-permeated part of slots means openings for the current-supply cable and a switch .. still may be provided.

Furthermore, the cap, in particular if it is provided with concentrically arranged slits have also radially extending reinforcing ribs.

The cap is removably connected to the frustoconical housing, for example by means of screws or threaded.

The free end of the housing is provided with a Hinterschneiduagversehen, to which a short conically verjUngendes anschliet part whose outer surface advantageously subtends an angle of about 210 with the center axis of the housing.

This conically tapered portion receives a corresponding getormtes, attachable hollow connector whose inner opening flush adjoins the inner opening of the housing.

This hollow Anschlubteil can be configured as a slot die or as Rundddse, which opens in the latter case the connector out like a trumpet by its free end.

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In addition, the hollow connecting part may be provided in its inner opening with several spoke-like and equi-spaced radial ribs, the resources, or the core of a cylindrical Bdrste a Föhnkamms or Ondulierstabes are firmly connected, or form a unit with these.

The cylindrical brush advantageously consists of a rigid central core from which several, preferably emanate eight radial ribs in a star shape.

These ribs are to each other include same angle whose vertex lies on the central axis of the brush.

In the outer edges of these ribs bristles are embedded such that their free ends lie in the outer surface of an imaginary cylinder whose central axis coincides with the central axis of the fixed central core of the brush.

The free end of the brush is covered with a flat disc that is fixed to the center core, or forms with it one piece.

The diameter of this disc should be larger than that of the central core of the brush, but smaller than that of the imaginary cylinder, in whose circumferential surface the free ends of the bristles lie.

The radial ribs of the hollow connecting piece, which carry the brush are advantageously arranged to respectively connect the inner surface of the hollow connecting member fixed to the outer edge of one of the ribs of the brush.

In this way it is ensured that the subsidized housing from the air stream is blown into the spaces that are enclosed by the star-shaped except to aspiring rows of bristles.

Normally four radial ribs are quite sufficient to give the brush a safe hit.

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Also for the brush, it has proven advantageous if the hollow connector opens out like a trumpet to his, the brush end facing.

Designed as a connecting part Föhnkamm, or curler can be fixed in the hollow terminal portion in the same manner as the brush.

However, there is also the possibility of providing a cover of the hollow connecting portion in such a manner that a part or the entire air flow of the inventive hair dryer unit in the hollow upper part of the comb, or can be blown into the hollow curler.

Both the comb and the curler must then be provided with openings which allow the air flow to escape so that it is directed at the hair to be treated.

The housing and other parts of the hair drying device of the invention will be advantageous made of a material with low weight, such as plastic or light metal.

In the housing, a blower means is arranged and fixed, comprising an electric motor and an impeller.

For fixing the electric motor on its outer side with fixed and for the purpose of guiding air optionally curved wings may be provided, which are fixed to the inner wall of the housing and hold the motor in the housing.

The impeller is mounted on the axis of the motor, it is in the immediate vicinity of the air inlet openings.

After the free end of the housing is the HeizOfltnt - seen in the direction of air flow - is arranged behind the engine and fastened by means of webs on the housing inner wall.

The heating element consists of a bobbin formed of two trapez5xörmigen plates of non-conductive and heat-resistant material, which are joined together in the center so that they viewed in cross

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section forming a cross of radial ribs, the arms enclose a right angle.

Of course, several of such panels can be provided instead of the two trapezium-shaped plates, which are also joined together at their center, wherein the angle between the radial ribs to be equal.

The outer edges of the radial ribs are formed such that they extend in parallel in the distance of the inner wall of the housing gleichmXtgen.

In addition, these outer edges of the bobbin advantageously have at equal intervals flat, preferably rectangular recesses which are shaped so that they can take a turn of a band-shaped resistor respectively.

The width of this ribbon-shaped resistor is to be a multiple of its thickness.

With this construction, the heating element to reach a minimum of flow resistance, since the end face of which the air flow opposes the belt-shaped resistance, in comparison to the total heat exchange area is very small ist7 there are between the adjacent turns of the coil air gaps, and thus a high heat exchange coefficient is achieved.

These gaps interrupt interface that would otherwise form a smooth surface and create turbulence of the air stream, resulting in a good heat transfer.

This fact allows the use of a smaller heat-exchanging surface, with a given, but the air-bearing wattage and hence lower dimensions for the entire hair drier.

In the accompanying drawings, an embodiment of the inventive hair dryer apparatus is illustrated schematically.

In the drawings:

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Figure 1 is a longitudinal section through a hair drier with a conical body and cylindrical brush attached thereto, wherein the inner parts and the

Brush shown in side view

Figure 2 is a plan view of the cover of the housing

Figure 3 is a plan view of the free end of the brush,

Figure 4 is an isometric view of a partially coiled heating element,

Figure 5 shows a portion of the rib edge of the bobbin,

Figure o isometric view of a partially wound cone-shaped heating element.

With reference to the Figures 1, 2 and 3, the hair dryer unit has a conical, hollow housing 1, which is preferably injection molded from plastic.

At its front the housing 1 has an exit opening 10 and at its rear end a removable lid 11.

This lid 11 is broken by air inlet openings 12 which are disposed around a solid central part 13 which carries a cable 14 and a switch 15.

A fan 2 is mounted inside the rear end housing.

It consists of a conical shaped blower housing 20, the rear end is open, so that the air has access, which is mounted in the rear end of the casing 1.

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An electric motor 21 is housed in the front part of the fan housing 20 and connected in this position by a plurality of ribs 23 in the form of aerodynamically profiled, curved Luftleitflügeln fixed to the blower housing 20.

On the motor shaft 25 is seated an axial impeller 26 which is capable of in fan housing 20 with a narrow air gap between the ends of the fan blades and the inside of the fan housing 20 to rotate.

An electrical line leads from the switch 15 for connection to the electric motor 21st

Prior to the blower means is an electric heating element third

It is attached in the front space of the housing 1 and consists of a winding carrier 3 in the form of two trapezoidal plates 31 perpendicularly cross each other and are joined together at their center, thereby four radial fins 32, 32 ', 32 '', 32ltt (see Figure 6) form.

In the outer edges of the ribs a plurality of shallow recesses 33 is provided, each of which contains a winding of a thin, band-shaped resistor 34.

The front end and the rear end of the plates 31 are extended and project beyond the edges of the ribs to the inner wall of the housing has corresponding recesses for receiving the said lugs.

An electrical line 37 connects the front end of the resistance winding with the cable connection 14, while the rear end of the winding is connected via the line 38 to the second terminal of the electric motor.

A cylindrical brush 4 is attached to the outlet end 10 of the housing 1 by means of a hollow flared trumpet-like molded article 41, which is pushed abruptly via an outer annular undercut 18 of the housing end.

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The brush 4 consists of a rigid central core 42, emanate radially from the eight radial ribs 43.

The front end of the brush 4 is covered by a flat disc 44 which is secured to the central core 42.

In the radial outer edges of the ribs 43 the bristles 45 are inserted, which form a brush of cylindrical shape.

The mold part 41 is fixedly connected to the brush 4 through four radial ribs 46 which extend between the outer edge at the rear end of four bristle-carrying ribs 43 to the inside of the trumpet-like shaped part 41 and are thus connected test.

The ertindungsgemässe hair drying device operates as follows: The axial impeller 24 draws air through the inlet openings 12, and conveys it to the exit end 10 of the housing first

The curved around the motor 21 guide vanes 23 are designed so that they direct the flow of air from a circular direction in an axial direction through the cone-shaped heating element 3.

The conical design of the housing 1 serves to accelerate the air so that it enters through the outlet opening into the spaces 47 formed between the ribs 43 of the brush 4 and from there through the bristles 45 into the material to be dried hair.

The respective shapes of the brush and the heating element are the factors which cause the reduction of the flow resistance in the hair drier.

So is easy to remove for the brush, for example, from the drawing that the out flowing from the outlet opening 10 of air in the gaps 47 in uniform, axial flow is maintained and then slowly flows through the bristles outwards, without experiencing a sudden reduction or change in direction , as is the case with tubular brushes previously used.

Many modifications and changes in the structure of the novel Huartrockners can be performed by a skilled person without that this concept of the invention and the scope of the claims will be left.

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As well as a wide slot or circular die may be mounted on the outlet end of the housing instead of the brush.

The round brush can be replaced by a Föhnkamm or a styling brush with clip device, the air in the case of Föhnkamms through the back into the wound directly onto the rod on the teeth and in the case of Frisierst abs by the measures provided for in this bar slots Hair is conducted.

Further, for example, also be designed in a cylindrical form the outer casing.

The support for the Zeiz- development may be more than four ribs, such as six or eight have.

And the heating element or resistor which can have more than one port at each end, so that the heating resistor can be loaded in different ways and size.

It is also possible to vary the number of ribs in accordance with the requirements and brush in accordance with the diameter and the length of the brush.

Instead of a Diagonalgebläserad Axialgebläserades can be employed if a higher pressure of the outflowing air to be achieved.

Due to the cylindrical-conical shape of the housing and through the fins on the engine can be produced with the inventive hair drier a highly accelerated airflow with minimal energy expenditure.

Due to the particular type and the special construction of the heater, this flow of air heated to the time inkürzester vorbedtimmte temperature and maintained at this temperature.

Due to the special configuration and arrangement of the heating coil, and the large contact surface with the air flow an optimal utilization of the electrical energy supplied to the heater is guaranteed.

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CLAIMS DE2618819

Patent speech Electric hair drier, consisting of:

A housing in the form of a hollow cylinder or valve plug, or a combination of these two forms, at one end to the other and at LuEtaustrittsörEnungen

End is provided with a circular air outlet, a blower device composed of an electric motor with respect to the one of the Innendurchmesscr

Smaller diameter and an axial housing Ge impeller mounted on the motor shaft, wherein the fan means is disposed coaxially in the part of the housing and rtickwärtigen near the Lufteintrittsötfnungen, a cylindrical or kegei?

örmigen electrical

Heating element, the housing in the front part coaxially in the Ge and, although located in the space between the blowing device and the Austrlttsöfnung, while the heating element is made of a test winding carrier consists of a non-conductive and heat-resistant material in the form of at least four longitudinal ribs on its a connecting line along the housing axis to a radially extending line, which relate mainly in parallel and in some distance from the housing wall verläuPt, and a band-shaped resistor into spirals on said winding support the

Outer edges of the radial fins is wound, the

Strip surface is directed substantially parallel to the housing wall and the air flow, the electrical line and switch means for

And power supply circuit of the fan motor and the heating element.

2.

Electrical ilaartrockengerät according to claim 1, characterized in that the housing has the shape of a long coated gelstumptes K, which is closed at its higher end with a rounded cap, which as the air inlet openings comprising a plurality of slots, while the free

End of the housing is provided with an undercut, followed by a short, conically tapering AuEstik-part adjoins who can auXzunehmen an attachable and hollow connector part.

3.

Electrical Ilaartrockengerät according to claim 2, characterized in that the hollow connection portion is a wide-slit nozzle.

4.

Electric hair drying device according to claim 2, characterized geLennzeidrnet that the hollow connector is located to its free end like a trumpet opening molding.

5.

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Electric hair drying device according to claim 2, characterized in that the hollow connecting part in its inner () frnung with several spoke-like and in the same

Is provided spaced radial ribs which are integral with the core of a cylindrical brush.

6.

Electric hair drying device according to claim 5, characterized in that the cylindrical brush consists of a solid core means of the plurality of radial

Go star-shaped ribs, in which the outer edges bristles are embedded, the free ends of a cylindrical

Forming mold, wherein the free end of the brush is covered with a flat, fixed to the center core disc whose diameter is larger than that of the center core, but smaller than that of the cylinder formed by the bristles.

7.

Electric hair drying device according to claim 2, characterized in that the hollow Anschlunteil is fixedly connected with the hollow back of a Föhnkamms.

X. El ektrisches hair drying device according to claim 2, characterized in that the hollow Anschlusste1.l list connected to a hollow Ondulierstah, who in his

Has surface air outlet apertures.

9.

Electric hair drying device according to Anspriichen 1 to 8, characterized in that the winding carrier of the

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Heating element along the outer edges of the radial

Ribs is provided at regular intervals with flat, right angled recesses that are so large that they can take a winding of the ribbon-shaped object cons respectively.

10.

Electrical Ilaartrockengerät according to claims 1 to 9, characterized in that the electric motor of the blower unit is provided at its outer side with fixed wings which are attached on the motor housing and are intended to provide in-the motor to hold the housing.

11.

Electrical hair drier as claimed in claims 1 to 10, characterized in that the fan unit comprises a cylindrical casing provided at its rear

Open end Urid: is closely matched in their outer Foom the inner surface of the rear housing portion and an attached by wing at the front of this envelope

Comprising an electric motor, on an axial fan whose axis is arranged, only a narrow gap between the fan blades and the inner surface of the shell is.

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DT 26 18 819 A 1

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Patentansprüche

1. Elektrisches Haartrockengerät, bestehend aus:

Einem Gehäuse in Form eines Hohlzylinders oder -kegels oder einer Kombination dieser beiden Formen, das an einem Ende mit Luftaustrittsöffnungen und am anderen Ende mit einer kreisförmigen Luftaustrittsöffnung versehen ist,

einer Gebläseeinrichtung, bestehend aus einem Elektromotor mit einem in bezug auf den Innendurchmesser des Gehäuses kleineren Durchmesser und einem axialen Gebläserad, das auf der Motorachse befestigt ist, wobei die Gebläseeinrichtung koaxial im rückwärtigen Teil des Gehäuses und in der Nähe der Lufteintrittsöffnungen angeordnet ist,

einem zylindrischen oder kegelförmigen elektrischen Heizelement, das im vorderen Teil koaxial in dem Gehäuse, und zwar im Raum zwischen der Gebläseeinrichtung und der Austrittsöffnung angeordnet ist, dabei besteht das Heizelement aus einem festen Wicklungsträger aus einem nichtleitenden und wärmefesten Material in Form von wenigstens vier längsgerichteten Rippen, die sich von einer Verbindungslinie entlang der Gehäuseachse radial bis zu einer Linie erstrecken, die im wesentlichen parallel und in bestimmten Abstand zur Gehäusewandung verläuft,und einem bandförmigen Widerstand, der in Spiralen auf den genannten Wicklungsträger über die Außenkanten der radialen Rippen gewickelt ist, wobei die Bandoberfläche im wesentlichen parallel zur Gehäusewand und zur Luftströmung gerichtet ist,

elektrischen Leitungs- und Schalteinrichtungen zur Stromversorgung und Schaltung des Gebläsemotors und des Heizelements.

ORIGINAL INSPECTED

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2. Elektrisches Haartrockengerät nach Anspruch 1, dadurch gekennzeichnet, daß das Gehäuse die Form eines langezogenen Kugelstumpfes hat, der an seinem stärkeren Ende mit einer gerundeten Kappe verschlossen ist, welche als Lufteinlaßöffnungen mehrere Schlitze aufweist, während das freie Ende des Gehäuses mit einer Hinterschneidung versehen ist, an die sich ein kurzer, sich konisch verjüngender Aufsteckteil anschließt, der ein aufsteckbares und hohles Anschlußteil aufzunehmen vermag.

3. Elektrisches Haartrockengerät nach Anspruch 2, dadurch gekennzeichnet, daß das hohle Anschlußteil eine Breitschlitzdüse ist.

4. Elektrisches Haartrockengerät nach Anspruch 2, dadurch gekennzeichnet, daß das hohle Anschlußteil ein sich nach seinem freien Ende hin trompetenartig öffnendes Formteil ist.

5. Elektrisches Haartrockengerät nach Anspruch 2, dadurch gekennzeichnet, daß das hohle Anschlußteil in seiner inneren Öffnung mit mehreren speichenartig und im gleichen Abstand zueinander angeordneten radialen Rippen versehen ist, die mit dem Kern einer zylindrischen Bürste fest verbunden sind.

6. Elektrisches Haartrockengerät nach Anspruch 5, dadurch gekennzeichnet, daß die zylindrische Bürste aus einem festen Mittelkern besteht, von dem mehrere radiale Rippen sternförmig ausgehen, in deren Außenkanten Borsten eingelassen sind, deren freie Enden eine zylindrische Form bilden, wobei das freie Ende der Bürste mit einer flachen, am Mittelkern befestigten Scheibe abgedeckt ist, deren Durchmesser größer als der des Mittelkerns, aber kleiner als der des von den Borsten gebildeten Zylinders ist.

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7. Elektrisches Haartrockengerät nach Anspruch 2, dadurch gekennzeichnet, daß das hohle Anschlußteil mit dem hohlen Rücken eines Föhnkamms fest verbunden ist.

8. Elektrisches Haartrockengerät nach Anspruch 2, dadurch gekennzeichnet, daß das hohle Anschlußteil mit einem hohlen Ondulierstab verbunden ist, der in seiner Oberfläche Luftauslaßschlitze aufweist.

9. Elektrisches Haartrockengerät nach Ansprüchen 1 bis 8, dadurch gekennzeichnet, daß der Wicklungsträger des Heizelementes entlang der Außenkanten der radialen Rippen in gleichmäßigen Abständen mit flachen, rechtwinkligen Aussparungen versehen ist, die so groß sind, daß sie jeweils eine Wicklung des bandförmigen Widerstandes aufnehmen können.

10. Elektrisches Haartrockengerät nach Ansprüchen 1 bis 9, dadurch gekennzeichnet, daß der Elektromotor der Gebläseeinheit an seiner Außenseite mit festen Flügeln versehen ist, die am Motorgehäuse befestigt sind und dazu dienen, den Motor in dem Gehäuse zu halten.

11. Elektrisches Haartrockengerät nach Ansprüchen 1 bis 10, dadurch gekennzeichnet, daß die Gebläseeinheit eine zylindrische Hülle aufweist, die an ihrem rückwärtigen Ende offen und in ihrer äußeren Form der Innenfläche des rückwärtigen Gehäuseteils eng angepaßt ist und einen im vorderen Teil dieser Hülle durch Flügel befestigten Elektromotor aufweist, auf dessen Achse ein Axialgebläserad angeordnet ist, wobei nur ein enger Zwischenraum zwischen den Gebläseflügeln und der Innenfläche der Hülle besteht.

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"Elektrisches Haartrockengerät"

Das erfindungsgemäße Haartrockengerät ist im wesentlichen ein elektrisches Gerät zum Erzeugen eines Warmluftstrahls, wobei dieses Gerät einen axialen Gebläsemotor aufweist, der im Endteil eines im wesentlichen zylindrischen Gehäuses untergebracht ist. Dieser Motor mit Gebläserad wird in dem Gehäuse mittels gebogener Leitflächen gehalten, die sich zwischen der äußeren Oberfläche des Motors und der inneren Oberfläche des Gehäuses befinden und diese beiden Flächen verbinden. Weiter weist das elektrische Haartrockengerät noch ein elektrisches Heizelement auf, das sich in dem zylindrischen oder sich verjüngenden Vorderteil des Gehäuses befindet. Dieses elektrische Heizelement besteht aus einer Wicklung eines auf einen Träger gewickelten bandförmigen Widerstandes, wobei die flache Seite aller Windungen die Außenfläche eines Zylinders, eines Prismas oder eines Kegel- oder Pyramidenstumpfes bilden, welche parallel zur Luftströmung verläuft, die ihrerseits der Gehäuseinnenwand folgt. Jede Windung ist von der Nachbarwindung durch einen Zwischenraum getrennt. Außerdem können an dem elektrischen Haartrockner, und zwar am Austrittsende des Luftstromes noch

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Zusatzgeräte befestigt werden, wie beispielsweise eine Bürste mit sternförmigem Querschnitt, einen Föhnkamm, eine Rund- oder Schlitzdüse und dergleichen.

Viele elektrische Haartrockner, insbesondere die für den häuslichen Gebrauch, haben ein pistolenförmiges Gehäuse, aus dessen Mündung die Warmluft ausgeblasen wird. Hinten am Griff des pistolenförmigen Gehäuses befindet sich meist ein Luftgebläse, während das elektrische Heizelement in dem Rohr des pistolenförmigen Gehäuses untergebracht ist. Die elektrische Energie wird diesen Geräten über ein Elektrokabel und einem Schalter zugeführt, die ebenfalls im Griff des pistolenförmigen Gehäuses angeordnet sind.

Es ist auch bereits bekannt, am Warmluftaustritt solcher Haartrockengeräte eine zylindrische oder kegelförmige Bürste anzubringen, die zwischen die Strähnen des zu behandelnden Haares gesteckt werden kann. Diese Bürsten eröffnen die Möglichkeit, das Trocknen des Haares zu beschleunigen und gleichzeitig das Haar zu bürsten, zu glätten oder zu kräuseln. Hierzu werden Bürste und das Haartrockengerät wellenförmig bewegt. Bei dieser Art von Haartrockengeräten ist die Bürste gewöhnlich abnehmbar, so daß das Gerät je nach den Erfordernissen und Wünschen mit oder ohne Bürste verwendet werden kann. An Haartrocknern, die ursprünglich für einen nicht behinderten Luftstrom aus der Mündung entwickelt worden sind, wird dadurch der Strömungswiderstand erhöht und die vom Trockengerät gelieferte Luftmenge vermindert. Die ursprüngliche Luftmenge ist in solchen Fällen nur wieder zu erreichen, wenn größere Ventilatoren und Elektromotoren in die Haartrockengeräte eingesetzt werden, die ihrerseits größere und schwerere Gehäuse erfordern und damit die Trockner plump und unhandlich machen.

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Andere Geräte, die mit Kämmen oder Bürsten ausgerüstet sind und eine im wesentlichen länglich-runde Form haben, können auf Grund ihrer Form nur mit Warmluftgebläseeinheiten von geringer Effektivität und Leistung ausgerüstet werden.

Hieraus ergibt sich als Aufgabe, ein elektrisches Haartrockengerät mit einer Einrichtung zum Befestigen von Zusatzgeräten, wie beispielsweise Bürsten, Kämmen und dergleichen zu entwickeln, wobei dem Luftstrom nur ein geringer Widerstand entgegengesetzt wird und der Haartrockner in einem bequem zu handhabenden Gehäuse, mit einem kleinen Gebläse und einem kleinen Motor, eine größere Luftmenge zu fördern vermag.

Es wurde ein elektrisches Haartrockengerät gefunden, das besteht aus:

einem Gehäuse in Form eines Hohlzylinders oder -Kegels oder einer Kombination beider Formen, das an seinem rückwärtigen Ende Lufteintrittsöffnungen und an seinem anderen Ende eine kreisförmige Luftaustrittsöffnung aufweist,

einer Gebläseeinrichtung, bestehend aus einem Elektromotor mit einem Durchmesser, der kleiner ist als der Innendurchmesser des Gehäuses und einem auf der Motorwelle befestigten axialen Gebläserad, das koaxial mit dem Gehäuse in der Nähe der Lufteintrittsöffnungen angeordnet ist,

einem zylindrischen beziehungsweise kegelförmigen elektrischen Heizelement, das im vorderen Teil koaxial mit dem Gehäuse in dem Raum zwischen der Gebläseeinrichtung und der Austrittsöffnung angeordnet ist und aus einem festen Wicklungsträger,

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aus einem nicht leitenden und wärmefesten Material in Form von wenigstens vier längs gerichteten Rippen, die sich von einer Verbindungslinie entlang der Gehäuseachse radial bis zu einer Linie erstrecken, die im wesentlichen parallel und im bestimmten Abstand zur Gehäusewandung verläuft und einem bandförmigen Widerstand, der in Spiralen auf den genannten Wicklungsträger über die Außenkanten der radialen Rippen gewickelt ist, wobei die Bandoberfläche im wesentlichen parallel zur Gehäusewandung und zur Luftströmung gerichtet ist.

Die Gebläseeinrichtung weist einen Elektromotor auf, der an seiner Außenseite mit festen, gebogenen Luftleitflächen versehen ist, die entweder direkt oder indirekt am Motorgehäuse befestigt sind und den Motor im Gehäuse des elektrischen Haartrockners halten. Auf der Achse des Motors ist ein axiales Gebläserad befestigt, das sich in unmittelbarer Nähe der Lufteintrittsöffnungen befindet.

Besonders vorteilhaft ist eine Ausführungsform des erfindungsgemäßen Haartrockengeräts, dessen Außengehäuse die Form eines langezogenen Kegelstumpfes hat, der an seinem stärkeren Ende durch eine gerundete Kappe verschlossen ist. Diese Kappe weist als Lufteinlaßöffnung mehrere Schlitze auf, die konzentrisch oder radial angeordnet sein können. In dieser Kappe, insbesondere in dem nicht von Schlitzen durchzogenen Mittelteil können noch Öffnungen für das Stromzuführungskabel und einen Schalter vorgesehen sein.

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Außerdem kann die Kappe, insbesondere wenn sie mit konzentrisch angeordneten Schlitzen versehen ist, auch noch radial verlaufende Verstärkungsrippen aufweisen. Die Kappe ist mit dem kegelstumpfförmigen Gehäuse lösbar, beispielsweise mittels Schrauben oder Gewinde verbunden. Das freie Ende des Gehäuses ist mit einer Hinterschneidung versehen, an die sich ein kurzes, sich konisch verjüngendes Teil anschließt, dessen Außenfläche mit der Mittelachse des Gehäuses vorteilhaft einen Winkel von etwa 21° einschließt.

Dieses konisch sich verjüngende Teil nimmt ein entsprechend geformtes, aufsteckbares, hohles Anschlußteil auf, dessen innere Öffnung bündig an die innere Öffnung des Gehäuses anschließt.

Dieses hohle Anschlußteil kann als Breitschlitzdüse ausgebildet sein oder auch als Runddüse, wobei sich im letzteren Falle das Anschlußteil nach seinem freien Ende hin trompetenartig öffnet. Außerdem kann das hohle Anschlußteil in seiner inneren Öffnung mit mehreren speichenartig und im gleichen Abstand zueinander angeordneten radialen Rippen versehen sein, die mit dem Kern einer zylindrischen Bürste, beziehungsweise eines Föhnkamms oder eines Ondulierstabes fest verbunden sind, beziehungsweise mit diesen eine Einheit bilden.

Die zylindrische Bürste besteht vorteilhaft aus einem festen Mittelkern, von dem mehrere, vorzugsweise acht radiale Rippen sternförmig ausgehen. Diese Rippen sollen untereinander gleiche Winkel einschließen, deren Scheitelpunkt auf der Mittelachse der Bürste liegt.

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In die Außenkanten dieser Rippen sind Borsten so eingelassen, daß deren freie Enden in der Mantelfläche eines gedachten Zylinders liegen, dessen Mittelachse mit der Mittelachse des festen Mittelkerns der Bürste zusammenfällt. Das freie Ende der Bürste ist mit einer flachen Scheibe abgedeckt, die am Mittelkern befestigt ist, beziehungsweise mit diesem ein Stück bildet. Der Durchmesser dieser Scheibe soll größer sein, als der des Mittelkerns der Bürste, aber kleiner als der des gedachten Zylinders,in dessen Manteifläche die freien Enden der Borsten liegen.

Die radialen Rippen des hohlen Anschlußstückes, die die Bürste tragen, sind vorteilhaft so angeordnet, daß sie jeweils die innere Oberfläche des hohlen Anschlußteils mit der Außenkante einer der Rippen der Bürste fest verbinden. Auf diese Weise ist sichergestellt, daß der aus dem Gehäuse geförderte Luftstrom in die Zwischenräume geblasen wird, die von den sternförmig nach außer strebenden Borstenreihen eingeschlossen werden. Normalerweise sind vier radiale Rippen völlig ausreichend, der Bürste einen sicheren Halt zu geben. Auch für die Bürste hat es sich bewährt, wenn das hohle Anschlußteil sich nach seinem, der Bürste zugekehrten Ende hin trompetenartig öffnet.

Der als Anschlußteil ausgebildete Föhnkamm,beziehungsweise Ondulierstab, kann in dem hohlen Anschlußteil in gleicher Weise befestigt sein wie die Bürste. Es besteht jedoch auch die Möglichkeit, eine Abdeckung des hohlen Anschlußteils in der Weise vorzusehen, daß ein Teil oder der gesamte Luftstrom des erfindungsgemäßen Haartrockengerätes in den hohlen Oberteil des Kamms oder in den hohlen Ondulierstab geblasen werden. Sowohl der Kamm als auch

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der Ondulierstab müssen dann mit Öffnungen versehen sein, aus denen der Luftstrom so austreten kann, daß er auf das zu behandelnde Haar gerichtet ist.

Das Gehäuse und die anderen Teile des Haartrockengerätes der Erfindung sollen vorteilhaft aus einem Material mit geringem Eigengewicht, wie beispielsweise Kunststoff oder Leichtmetall gefertigt sein.

In dem Gehäuse ist eine Gebläseeinrichtung angeordnet und befestigt, die aus einem Elektromotor und einem Gebläserad besteht. Zur Befestigung kann der Elektromotor an seiner Außenseite mit festen und zum Zwecke der Luftführung gegebenenfalls gebogenen Flügeln versehen sein, die an der Innenwandung des Gehäuses befestigt sind und den Motor im Gehäuse halten. Das Gebläserad ist auf der Achse des Motors so befestigt, daß es sich in unmittelbarer Nähe der Lufteinlaßöffnungen befindet.

Nach dem freien Ende des Gehäuses hin ist das Heizelement - in Richtung des Luftstromes gesehen - hinter dem Motor angeordnet und mittels Stegen an der Gehäuseinnenwand befestigt. Das Heizelement besteht aus einem Wicklungsträger, der von zwei trapezförmigen Platten aus nicht leitendem und wärmebeständigem Material gebildet wird, die in ihrer Mitte so zusammengefügt sind, daß sie im Querschnitt gesehen ein Kreuz von radialen Rippen bilden, dessen Arme einen rechten Winkel einschließen. Selbstverständlich können anstelle der zwei trapezförmigen Platten auch mehrere solcher Platten vorgesehen werden, die ebenfalls in ihrer Mitte zusammengefügt sind, wobei die Winkel zwischen den radialen Rippen gleich sein sollen. Die Außenkanten dieser radialen Rippen sind so ausgebildet, daß sie im gleichmäßigen Abstand der Innenwandung des Gehäuses parallel verlaufen.

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Außerdem weisen diese Außenkanten des Wicklungsträgers vorteilhaft in gleichen Abständen flache, vorzugsweise rechteckige Aussparungen auf, die so geformt sind, daß sie jeweils eine Windung eines bandförmigen Widerstandes aufnehmen können. Die Breite dieses bandförmigen Widerstandes soll ein Vielfaches seiner Dicke betragen. Durch diesen Aufbau des Heizelementes wird ein Minimum an Strömungswiderstand erreicht, da die Stirnseite, die der bandförmige Widerstand dem Luftstrom entgegenstellt, im Vergleich zu der gesamten Wärmeaustauschfläche sehr klein ist, da sich zwischen den benachbarten Windungen der Wicklung Luftzwischenräume befinden und auf diese Weise ein hoher Wärmeaustauschkoeffizient erreicht wird. Diese Zwischenräume unterbrechen die Grenzfläche, die sonst eine glatte Oberfläche bilden würde und schaffen Turbolenzen des Luftstroms, wodurch sich ein guter Wärmeübergang ergibt. Diese Tatsache erlaubt die Verwendung einer kleineren Wärmeaustauschfläche, bei einer gegebenen, an die Luft zu übertragenden Wattleistung und damit geringerer Abmessungen für das gesamte Haartrockengerät.

In den beiliegenden Zeichnungen ist eine Ausführungsart des erfindungsgemäßen Haartrockengerätes schematisch dargestellt. Es zeigen:

Abbildung 1 einen Längsschnitt durch ein Haartrockengerät mit kegelförmigem Gehäuse und daran befestigter zylindrischer Bürste, wobei die Innenteile und die Bürste in Seitenansicht gezeigt sind,

Abbildung 2 eine Draufsicht auf den Deckel des Gehäuses,

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