

[54] DRY SHAVING DEVICE

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[58] Field of Search: 30/34.1, 43.91, 43.92, 346.51

[56] References Cited

UNITED STATES PATENTS

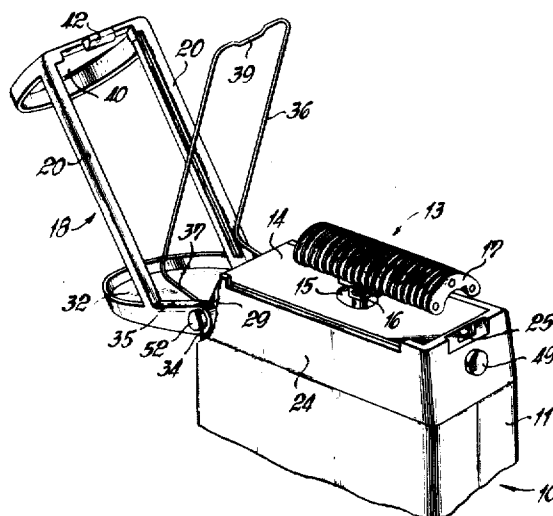
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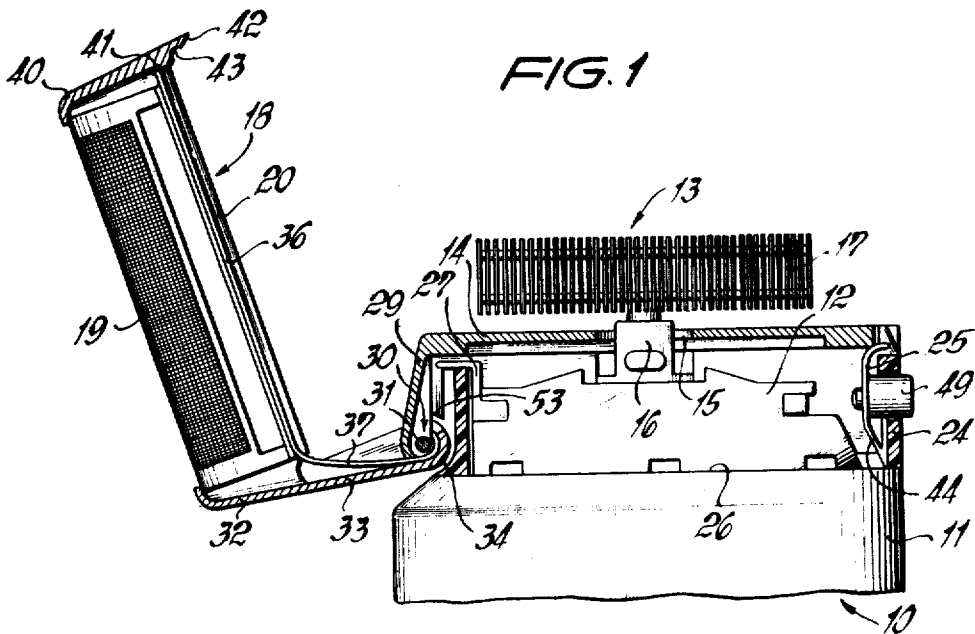
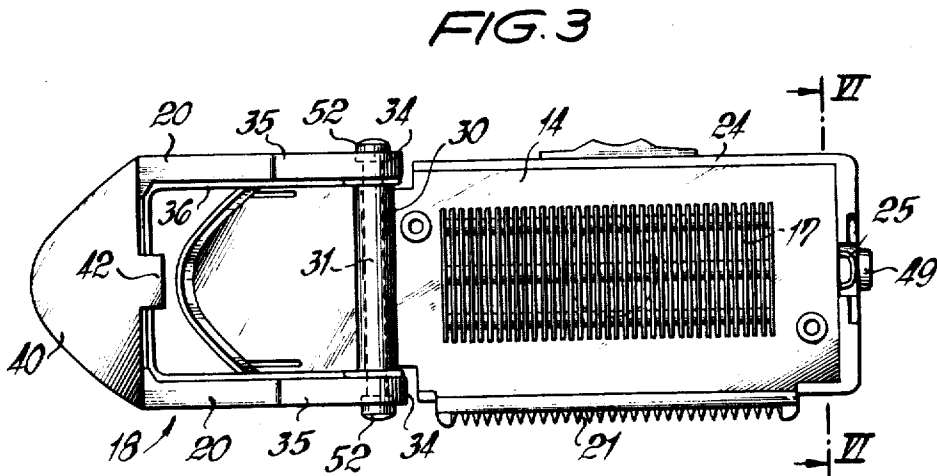
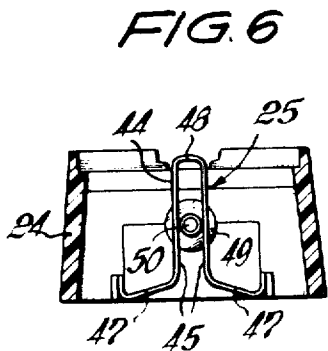
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[57] ABSTRACT

A dry shaving device, which comprises a driving means and a housing including a head and receiving the driving means. A cutter head is arranged above the head of the housing. The cutter head includes a knife head. A cutter sheet covers over the knife head, and a frame of the cutter head is swingably mounted at one of its ends at a lower lateral range of the head of the housing. A holding element is coordinated to the frame of the cutter head and secures the cutter sheet to the frame of the cutter head. The holding element is designed as a bow capable of being attached to the lower side of the frame of the cutter head. A bearing axle receives independently and swingably the holding element and the frame of said cutter head, and the holding element is repeatedly releasably secured to portions of the frame of the cutter head.

4 Claims, 6 Drawing Figures





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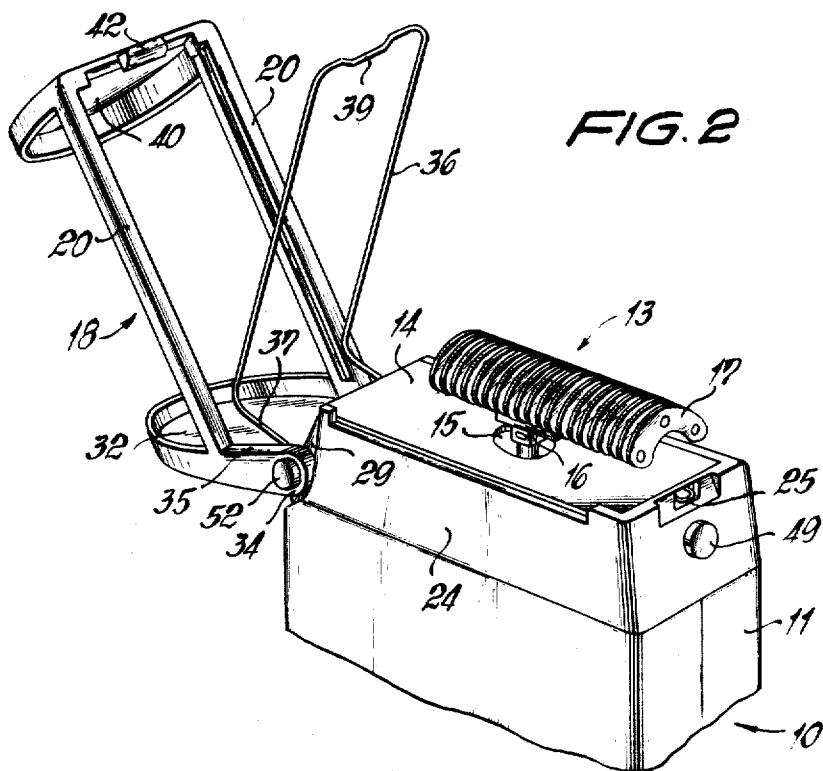


FIG. 2

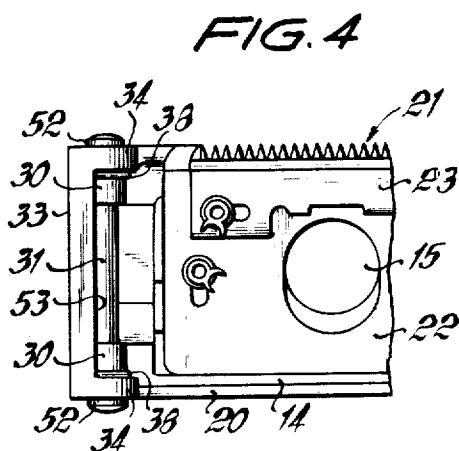


FIG. 4

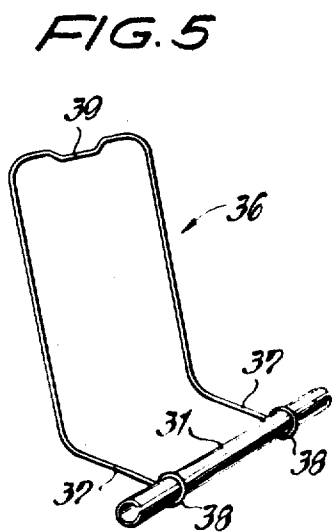


FIG. 5

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DRY SHAVING DEVICE

The present invention relates to a dry shaving device with a cutter head, provided above the head of a housing, which housing receives a driving means, with a knife block capable of being driven and with a cutter sheet, which covers over the knife block, and which is secured to a frame of the cutter head by means of a holding element coordinated to the frame, which frame is swingably mounted at one of its ends on a lower side range of the head of the housing. A such proposed dry shaving device has from the start the advantage, that due to the swingable arrangement of the frame of the cutter head, which receives the cutter sheet, at a lower lateral range of the housing head, the frame of the cutter head together with the cutter sheet assumes a position, even when the knife block to be driven is laid bare for the purpose of cleaning the cutter head, which position renders the entire interior space of the said cutter head easily accessible. It is however still perceived as a drawback at these dry shaving devices, that the removal of the cutter sheet from the frame of the cutter head for the purpose of thoroughly cleaning or exchanging the cutter sheet is very cumbersome to handle at the previously proposed arrangement such, that a non-objectional removal or insertion of the cutter sheet, respectively, is connected with great difficulties for a user, who is as a rule technically unskilled, because on the one hand a damage of the cutter sheet is very easily possible and, on the other hand, the parts required for folding of the cutter sheet are very easily rendered useless upon non-skilled handling.

It is, therefore, one object of the present invention to provide a dry shaving device of the type described above, the above mentioned advantageous of which are retained, the cutter head of the device is, on the one hand, capable of a quick and economical assembly and permits, on the other hand, a technically non-trained user an easy servicing and attendance, as well as the effortless exchanging of individual parts.

It is another object of the present invention, to provide a dry shaving device of the type mentioned above, wherein the holding element is designed as a bow, attachable to the lower side of the frame of the cutter head, and which bow is independently swingable on the swinging axle of the housing head, which swinging axle receives the frame of the cutter head, and which bow is also repeatedly detachably securable to parts of the frame of the cutter head.

By this measure in accordance with the present invention it is equal to previous devices easily possible to lay bare, the interior space of the cutter head by tilting the frame of the cutter head, which receives the cutter sheet, whereby beyond that the holding element which secures the cutter sheet, is easily detachable from or again attachable to the frame of the cutter head, respectively, for the purpose of removing or again inserting the cutter sheet, respectively, without thereby losing the connection of the securing element with the dry shaving device. At the same time, in this manner the effective securing position of the holding element with respect to the frame of the cutter head or to the cutter sheet, respectively, which is to be secured therein, is always univocally predetermined.

Suitably the holding element is thereby designed as a wire bow and equipped with bearing eyes, having formed thereon free arms ends for the mounting on the

swinging axle on the housing head, whereby the holding element can be manufactured in one piece including its bearing points and beyond that can be made of a strength of material, which can easily be formed, since this design creates in connection with the mounting of the arm ends a stable basic shape. In order to further maintain the shape of the holding element that can furthermore ensue between the parts of the housing head carrying the bearing axle and the bearing points of the frame of the cutter head.

For a repeatedly releasable connection of the holding element with the frame of the cutter head, it is adjustable, in order to secure the cutter sheet to coordinate a resting position of the frame of the cutter head to the stay of the bow, which is opposite to the bearing points of the holding element, and to provide this resting position preferably within the range of a resting hose, which serves the securing of the frame of the cutter head in the operative position and which is engageable in a counter rest of the housing head.

In order to enable the user to exchange the frame of the cutter head or the holding element, respectively, when occasion arises, the bearing axle, which receives these parts, is in accordance with a further object of the present invention, designed as a sleeve-like, longitudinally slotted and thereby radially resiliently compressible body, which is clampingly insertable into complementary receiving means of the housing head. By this arrangement, when installing the axle, it is only required to slide in the axle through the receiving means of the housing head as well as through the bearing points of the frame of the cutter head and the holding element, respectively, at the same time slightly compressing, whereby the axle after insertion assumes a firm seat in the receiving means of the housing head. In order to avoid an undesirable displacing of the bearing axle also by foreign bodies, with which bodies forces can be effective, which neutralize the pressure locking in the axial direction, it is furthermore advisable, to hold shorter the bearing axle than the external distance of the respective bearings, which are arranged on the end sides, and to form the outer ranges of the bearing points capable of receiving plug-like insertable closing means, whereby the bearing axle is effectively screened from larger directly effective force influences.

In order to be able to simplify beyond that the total assembly of the dry shaving device designed in accordance with the present invention by pre-assembling of individual structural groups it is furthermore still suitable to arrange the receiving means for the bearing axle on an angularly bent portion of a covering plate, which serves the covering of the head of the housing with respect to the cutter head, and which angularly bent portion overlaps laterally the housing head such, that the frame of the cutter head with the cutter sheet as well as the complementary holding element and the axle with the covering plate are applicable onto the housing head of the dry shaving device as a pre-assembled structural unit.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which the present invention is disclosed by way of example only and in which:

FIG. 1 is an elevation, partly in longitudinal section of a dry shaving device in accordance with the present invention, with a cutter head in its opened state;

FIG. 2 is a perspective view of the dry shaving device shown in FIG. 1, the cutter sheet being removed and the holding element in released position;

FIG. 3 is a top plan view of the cutter head in its opened state;

FIG. 4 is a fragmentary bottom plan view of the cutter head;

FIG. 5 is a perspective view of the holding element; and

FIG. 6 is a section along the lines VI—VI of FIG. 3.

Referring now to the drawings, it is above all to be mentioned, that only those parts of the below described embodiment of a dry shaving device 10 in accordance with the present invention are shown in the drawings, which are important for the understanding of the present invention. For the over all view, the complete showing of the housing 11 and the electrical driving means received in the housing 11 has been omitted, since these omitted parts may be of a known structure, whereby it is to be added, that the driving means of the present dry shaving device 10 is designed as swinging armature driving. In the drawing substantially only a head 12 of the housing 11, as well as a cutter head 13 arranged above this head 12 of the housing 11 are shown, whereby the head 12 of the housing 11 is closed up. With respect to the cutter head 13 by means of a covering plate 14, which however is equipped with a break through 15 for the passage of a swinging lever 16 of the electrical driving means.

The cutter head 13 in its turn comprises a block of knives 17, releasably disposed on the swinging lever 16, to which block of knives 17 is coordinated a cutter sheet 19, which is secured curvedly in a frame 18 of the cutter head 13, and which cutter sheet 19 the cutter part for short hair cutting of the dry shaving device by cooperating with the block of knives 17, which is capable of being reciprocated by the driving means.

Below the covering plate 14 is further arranged a cutter 21, for long hair cutting, comprising a plate-like shaped resting cutter knife 22 and a cutter knife 23, which is disposed adjacent to the resting cutter knife 22, and which can selectively be reciprocated by means of the swinging lever 16. The cutter for long hair 21 is mounted displaceably in its transverse direction and below the covering plate 14 by means of the resting cutter knife 22 such, that in case the cutter for long hair 21 is not used, it can be completely retracted into the head 12 of the housing 11, while it can be displaced overlapping a longitudinal side of the head 12 of the housing 11 for the purpose of using it.

Below the covering plate 14 is furthermore provided an intermediate part 24 of the housing, which laterally closes the head 12 of the housing 11 and which is designed in about a case-like shape, and which is provided with an actuating member (not shown) for transporting the cutter for long hair 21 between its operating and resting position and with a locking 25, still to be described, for the frame 18 of the cutter head 13, of the cutter sheet 19. The securing of the intermediate part 24 of the housing 11 ensues in simple manner by means of the butt sided support at a step 26 of the housing 11 and securing it from above by means of the covering

plate 14, which in its turn laterally overlaps the intermediate part 24 of the housing, and which is directly connected with parts of the head 12 of the housing 11 by means of securing elements 27, by example, by screws or clamps.

The covering plate 14 is equipped with an angularly bent portion 29, which is arranged at the one narrow side of the dry shaving device, and which laterally overlaps the head 12 of the housing 11. At the free ends of the angularly bent portion 29 receiving means 30 are provided, in which a bearing axle 31 is retained. The bearing axle 31 in its turn carries pivotally the frame 18 of the cutter head 13 for the cutter sheet 19, for which purpose this frame 18 is equipped with a lug 33 emanating from one of its end sides, on the end of which lug 33 bearings 34 are provided for the purpose of leading through the bearing axle 31. The lug 33 emanating from the side cheek 32 is thereby positioned such, that it enables, on the one hand, the resting of the frame 18 of the cutter head 13 with its frame stays 20 upon the covering plate 14 and, on the other hand, however enables a tilting of the frame 18 of the cutter head 13 about an angle of more than 90°, in more than this position a proper cleaning of the cutter head 13 from hair deposits or the like is possible.

Furthermore, the cutter sheet 19 is releasably arranged in the frame 18 of the cutter head 13, whereby the cutter sheet 19 is put into receiving means of the frame stays 20 of the frame 18 of the cutter head 13 with holding pins (not shown) arranged on its longitudinal sides in a known manner, and is secured by means of a bow-like shaped holding element 36, which is shaped in adaptation to the frame stays 20, and which is arranged attachably to the frame stays 20. The holding element 36 is thereby provided, as is shown in particular in FIG. 2, with angularly bent legs 37 in adaptation to the protection 33 of the end wall 32 of the frame 18 of the cutter head 13, the free ends of which legs 37 are formed to bearing eyes 38. By means of these bearing eyes 38 the holding element 36 is mounted on the bearing axle 31 adjacent to the frame 18 of the cutter head 13, in particular independently pivotally with respect to the latter, whereby in the embodiment shown in the drawings, the bearing eyes 38 are arranged between the outside disposed receiving means 30 of the angularly bent portion 29 of the covering plate 14, and the bearing points 34 of the frame 18 of the cutter head 13. In case the frame 18 of the cutter head 13 is tilted off the knife block 17, the holding element 36 is separately swingable on the bearing axle 31, whereby the cutter sheet 19 can be freed and thereby it can be released from the frame 18 of the cutter head 13. For the purpose of reinserting the removed cutter sheet 19 or another cutter sheet 19, respectively, it is only required to insert it again into the frame 18 of the cutter head 13 in the provided position, and to secure it by moving back the holding element 36 into the securing position.

In order to avoid an undesired release of the securing element 36 relative to the frame 18 of the cutter head 13, upon opening of the cutter head 13, the bow stay 39 of the holding element 36 is capable of being pressed into a resting place 41 of the resting nose 42 at the adjacent end side 40 of the frame 18 of the cutter head 13 such, that a repeatedly releasable connection between the frame 18 of the cutter head 13 and the bow stay 39 of the holding element 36 is feasible.

The resting nose 42 is in addition to the resting place 41 provided with a further resting place 43, which is repeatedly releasably engageable with a lock 25 received in the intermediate part 24 of the housing 11, whereby the frame 18 of the cutter head 13 with the cutter sheet 19 is securable in the operating position, which covers over the knife block 17. The lock 25 is thereby formed, as shown in FIGS. 1 and 6, substantially by a spring bow 44, with plugs 45 extending parallelly to each other, whereby the ends of the legs 45 are bent outwardly and against the complementary wall of the intermediate part 24 of the housing 11 and are inserted in each one of receiving spaces 47 of the intermediate part 24. The stay 48, which connects the legs 45 with each other, of the spring bow 44 is thereby also outwardly bent back and is determined for direct cooperation with the resting place 43 of the resting nose 42, whereby the stay 48 is arranged simultaneously within the range of a recess (not indicated) of the intermediate part 24 of the housing 11, which recess enables the entering of the resting nose 42, upon closing the cutter head 13.

For the purpose of loosening the lock 25, the spring bow 44 is equipped with an actuating button 49 projecting through the intermediate part 24 of the housing 11, and which actuating button 49 is capable of entering with its end part 50 having a reduced diameter, between the legs 45 of the spring bow, whereby the legs 45 grip into undercuts (not indicated) of the end part 50 of reduced diameter. In order to unlock the frame 18 of the cutter head 13, it is only required to press inwardly the actuating button 49, whereby the spring bow 44 receives a resilient tension, which causes a returning into the locking position upon release of the actuating button 49.

It is still to be mentioned, that the projection 33 of the end wall 32 of the frame 18 of the cutter head 13 is throughout designed in its elongation of the end side 32, whereby ribs 35 carrying the bearing places 34 are formed at the lateral edges of this projection 33. The lower edge 53 of the projection 33 thereby serves as abutment, which cooperates with ranges of the angularly bent portion 29 of the covering plate 14, which ranges face the head 12 of the housing 11, and which edge 53 thereby limits, in the shown embodiment, the swingable range of the frame 18 of the cutter head 13 such, that the frame 18 cannot be tilted farther than the position shown in FIG. 1.

Finally, it is to be pointed out, that the bearing axle 31 for reception of the frame 18 of the cutter head 13 and of the holding element 36 is designed in the manner of a clamping sleeve, which is tube-like curved of resiliently deformable material is provided with a longitudinal slot, whereby the starting diameter of the bearing axle 31 is kept larger for the slight amount than the inner diameter of the receiving means 30 of the angularly bent portions 29 of the covering plate 14 such, that the bearing axle 31 is insertable clampingly and thereby self-securingly into the receiving means 30 and then is no more secured by means of additional securing elements as screwing elements or rivet heads. In order to avoid, however, the effect of foreign bodies into the bearing axle 31, with which foreign bodies larger axial forces counteracting the pressure clamping can affect undesiredly the bearing axle 31, the bearing axle being arranged somewhat shorter than the end-sided arranged bearing places, which in the shown em-

bodiment are the bearing places 34 of the frame 18 of the cutter head 13, whereby the outer side of the bearing places of these are widened for the insertion of plug-like closing elements 52, the application of the latter being shown in FIG. 3, and which advantageously consist of resiliently compressible material, by example, a suitable synthetic material.

As already mentioned, the shown embodiment represents only an example of an embodiment in accordance with the present invention not in a limiting sense. Furthermore, still numerous changes and other arrangements are possible. Such the frame of the cutter head could be designed in another basic shape and in adaptation thereto also the holding element for the cutter sheet. Also it is imaginable within the scope of the present invention to provide the releasable connection between the cutter head and the holding element in another known manner, whereby a pressure locking or a locking by shape between these parts could be chosen. Beyond that, of course, the shown basic shape of the cutter head or the head of the housing, respectively, can be altered corresponding with the prevailing requirements. Also it is possible to chose another embodiment of the bearing axle, whereby this axle could be manufactured as solid axle and also could be secured, by example, releasably by means of the arrangement of rivet heads in the receiving means of the covering plate.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense.

I claim:

1. A dry shaving device comprising

a driving means,

a housing including a head and receiving said driving means,

a cutter head being arranged above the head of said housing,

said cutter head including a knife head,

a cutter sheet covering over said knife head,

a frame of said cutter head being swingably mounted at one of its ends at a lower lateral range of said head of said housing,

a holding element coordinated to said frame of said cutter head and securing said cutter sheet to said frame of said cutter head,

said holding element being designed as a bow capable of being attached to the lower side of said frame of said cutter head,

a bearing axle receiving independently and swingably said holding element and said frame of said cutter head,

said holding element being repeatedly releasably secured to portions of said frame of said cutter head, and

said holding element comprises a bow of wire, and having free leg ends including bearing eyes, for the mounting of said housing head on said bearing axle.

2. The dry shaving device, as set forth in claim 1, wherein

said holding element has a bow stay disposed opposite said bearing eyes,

said frame of said cutter head including a resting place coordinated to said bow stay,

said resting place including a resting nose serving the securing of said cutter head in its operating position and equipped with a counter rest of said housing head, and
 said resting place being arranged within the range of said resting nose, and
 said resting nose is engageable with said counter rest.
 3. A dry shaving device comprising
 a driving means,
 a housing including a head and receiving said driving means,
 a cutter head being arranged above the head of said housing,
 said cutter head including a knife head,
 a cutter sheet covering over said knife head,
 a frame of said cutter head being swingably mounted at one of its ends at a lower lateral range of said head of said housing,
 a holding element coordinated to said frame of said cutter head and securing said cutter sheet to said frame of said cutter head,
 said holding element being designed as a bow capable of being attached to the lower side of said frame of said cutter head,
 a bearing axle receiving independently and swingably said holding element and said frame of said cutter head,
 said holding element being repeatedly releasably secured to portions of said frame of said cutter head,
 said holding element is mounted on said bearing axle between portions of said housing head and bearing places of said frame of said cutter head, and
 said bearing axle is shorter than the external distance between said bearing places provided at the end sides of the latter, and the outer ranges of said

bearing places are widened for the reception of plug-like insertable closing means.
 4. A dry shaving device comprising
 a driving means,
 a housing including a head and receiving said driving means,
 a cutter head being arranged above the head of said housing,
 said cutter head including a knife head,
 a cutter sheet covering over said knife head,
 a frame of said cutter head being swingably mounted at one of its ends at a lower lateral range of said head of said housing,
 a holding element coordinated to said frame of said cutter head and securing said cutter sheet to said frame of said cutter head,
 said holding element being designed as a bow capable of being attached to the lower side of said frame of said cutter head,
 a bearing axle receiving independently and swingably said holding element and said frame of said cutter head,
 said holding element being repeatedly releasably secured to portions of said frame of said cutter head,
 said holding element is mounted on said bearing axle between portions of said housing head and bearing places of said frame of said cutter head,
 an angularly bent portion laterally overlapping said housing head,
 said receiving means for said bearing axle are provided on said angularly bent portion,
 said angularly bent portion is part of a covering plate, and
 said covering plate serving the closing of said housing head relative to said cutter head.

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