Feb. 17, 1942. E. J. TE' PAS 2,273,739

SHAVING DEVICE AND CUTTER HEAD THEREFOR

Filed Jan. 9, 1939 2 Sheets-Sheet 1

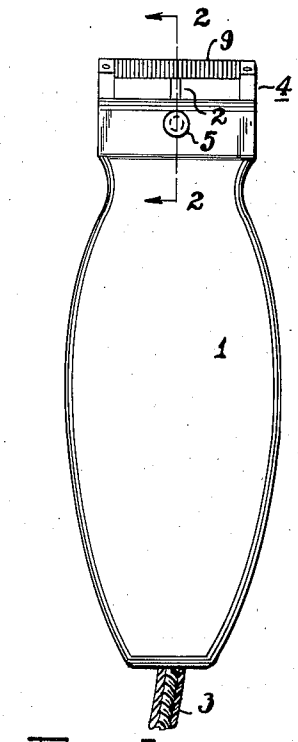



FIG.-1

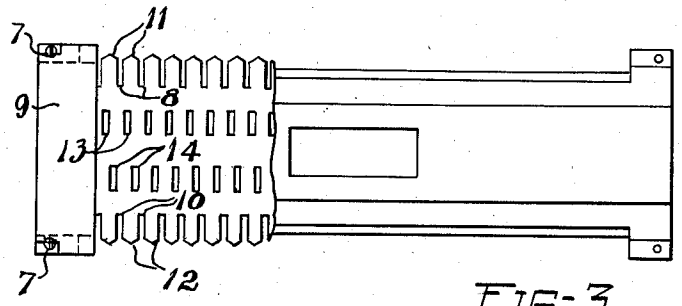



FIG.-3

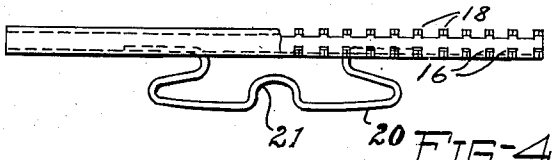



FIG.-4

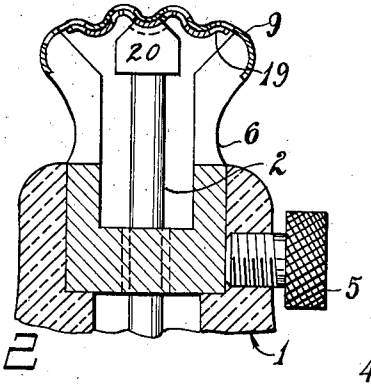



FIG.-2

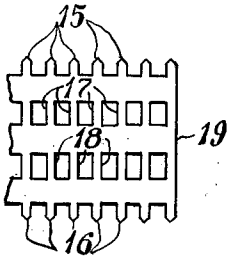



FIG.-5




FIG.-9

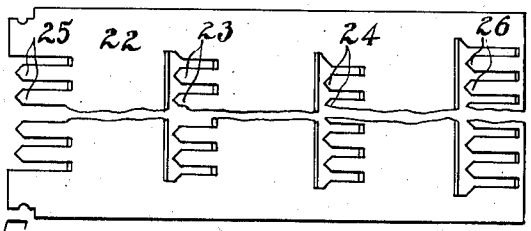



FIG.-6

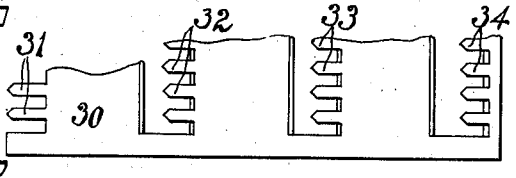



FIG.-7

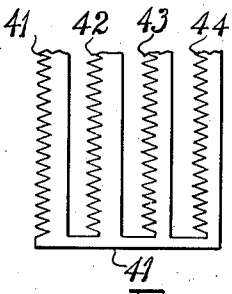



FIG.-10

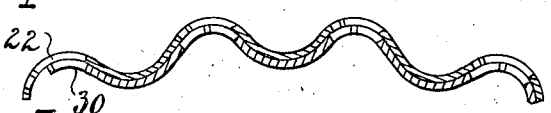



FIG.-8

INVENTOR

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SHAVING DEVICE AND CUTTER HEAD THEREFOR

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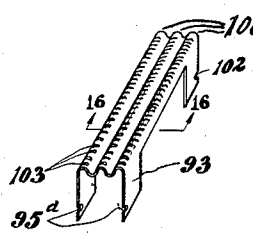



FIG.-16

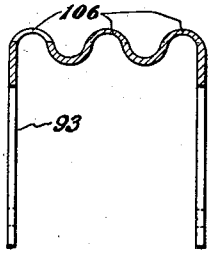



FIG.-17

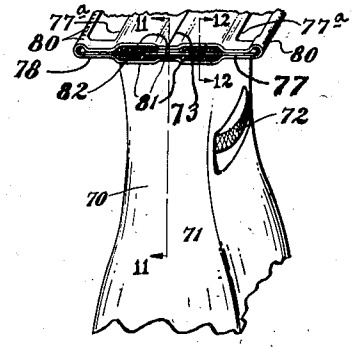



FIG.-11

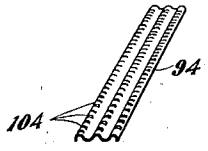



FIG.-18

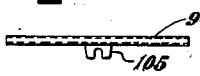



FIG.-19

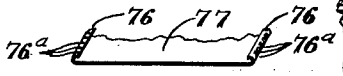



FIG.-22

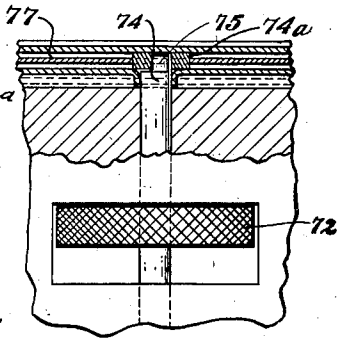



FIG.-12

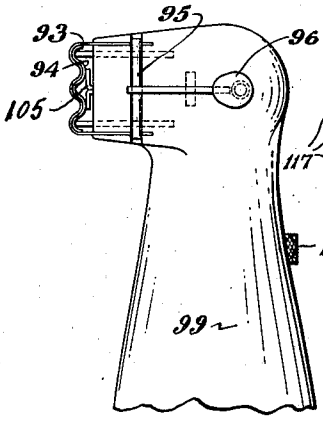



FIG.-15

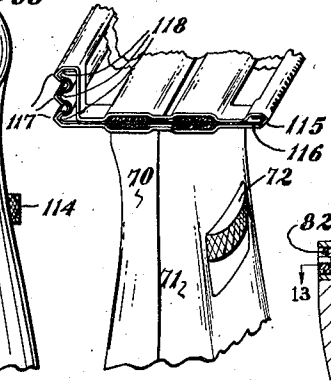



FIG.-21

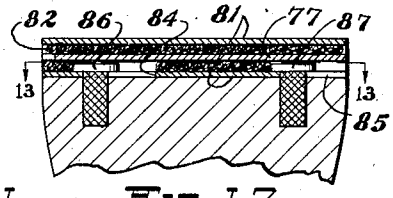



FIG.-13

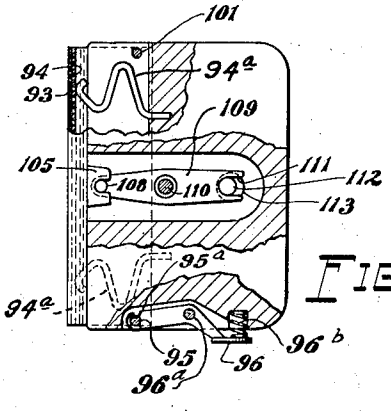



FIG.-20

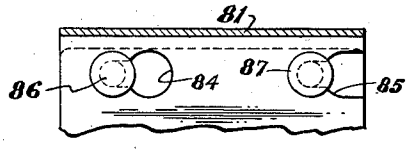



FIG.-14

INVENTOR

Edmund J. Te Pas

Patented Feb. 17, 1942 2,273,739

# UNITED STATES PATENT OFFICE

2,273,739

## SHAVING DEVICE AND CUTTER HEAD THEREFOR

Edmund J. Te Pas, Euclid, Ohio; Coletta A. Te Pas administratrix of said Edmund J. Te Pas, deceased

Application January 9, 1939, Serial No. 249,898

4 Claims. (Cl. 30—43)

This invention relates to shaving devices and in particular to devices of the type commonly referred to as dry shavers.

The present application is a continuation-in-part of my copending application Serial No. 101,615, filed September 19, 1936, for Shaving device, which earlier filed application is directed specifically to the species of the invention illustrated in Figures 1 to 9 of the drawings thereof.

The invention has for its objects the provision of a cutter head for a shaving device of the type described, which is adapted to shear all of the hair in a given area upon one stroke of the cutter head over such area; the provision of a cutter head formed from a relatively thin, normally flexible piece of sheet metal which is configurated so as to be rendered substantially rigid; the provision of a shaver head adapted for both fast shaving over unobstructed areas and close shaving in the hard-to-get-at places; the provision of an improved means for maintaining proper contact between the cooperating cutting elements of the device; and the provision of a shaver head which is adapted to permit marked economies in the manufacture of the device.

In the drawings:

Figure 1 is a side elevational view of a shaver illustrating one modification of the invention;

Figure 2 is an enlarged detail sectional view taken on line 2—2, Figure 1;

Figure 3 is an enlarged plan view of the cutter head with a portion of the face plate thereof broken away;

Figure 4 is an enlarged side elevational view of the movable cutter of the cutter head;

Figure 5 is a detail plan view of a portion of the movable cutter;

Figure 6 is a greatly enlarged, fragmentary plan view of a modified form of face plate;

Figure 7 is a greatly enlarged, fragmentary plan view of a modified form of cutter;

Figure 8 is a sectional view showing the guard and cutter members of Figures 6 and 7 in assembled relation;

Figure 9 is a sectional view of a guard and a modified form of cutter member;

Figure 10 is a fragmentary plan view of the cutter shown in sectional view Figure 9;

Figure 11 shows another form of hair- cutting or shaving device illustrative of another modification of the invention;

Figures 12 and 13 are enlarged detail sectional views taken on lines 11—11 and 12—12, respectively, of Figure 11;

Figure 14 is a detail sectional view taken on line 13—13, Figure 13;

Figure 15 illustrates another modification of the invention;

Figure 16 is a perspective view of the guard member used in connection with the device illustrated in Figure 15;

Figure 17 is an enlarged sectional view of the guard member taken on line 16—16, Figure 16;

Figure 18 is a perspective view of a movable cutter member which is used in connection with the guard member illustrated in Figure 16;

Figure 19 is a side elevational view of the cutter shown in Figure 18;

Figure 20 is an end view, partly in section, of the operating end of the device shown in Figure 15;

Figure 21 is a perspective view of yet another modification of the invention; and

Figure 22 is a fragmentary perspective view of the movable cutter used in the shaver shown in Figure 11.

The species of the invention illustrated in Figure 1 of the drawings comprises a hollow handle 1, within which a motor (not shown) is provided for oscillating a drive lever 2. Current to the motor is supplied by means of an electric cord 3. The device is provided with a cutter head indicated generally by the numeral 4 which may be held in place in the handle 1 by means of a thumb screw 5. The cutter head comprises a frame or body portion 6 and a relatively thin, corrugated, sheet-metal face plate 9 of substantially uniform thickness. The face plate is secured at its corners to the corner posts of the frame member 6 by any suitable means such as screws 7.

The face plate 9 is provided at one of its edges with a series of open slots 8 and at its opposite edge it is provided with a similar series of open slots 10. These slots define curved, pointed cutter bars or comb teeth 11 and 12, respectively. The intermediate portion of the face plate is provided with two series of slots 13 and 14 which define a plurality of curved or U-shaped cutter bars which are supported at their opposite ends. The slots defining the cutter bars and comb teeth extend across the crests of the ridges defined by the corrugations of the face plate.

By referring to Figure 3 of the drawings, it will be seen that the slots of each series are staggered or offset with respect to the slots of the next series. The slots are of such width and so placed that the entire area of the skin is exposed to the cutting action of the device upon

a single stroke of the shaver over a given area. The face plate is of substantially uniform thickness throughout its entire area. The crests of the corrugations, however, may be ground down slightly so as to permit extremely close shaving.

The movable cutter 19 of the device which is illustrated in detail in Figure 5, comprises a series of cutter teeth 15 at one edge and an oppositely pointing series of cutter teeth 16 at its opposite edge. Intermediate the two edges of the cutter, a series of cutter bars 17 and another series of cutter bars 18 are provided. The cutter member 19 in general conforms to the outline of the face plate of the cutter head as is evident from a consideration of Figure 2 of the drawings.

Proper contact is maintained between the face plate 9 and the movable cutter 19 by means of a folded-over flat spring 20, the ends of which are welded or otherwise fixedly secured to the underside of the cutter member. The intermediate portion of the spring 20 is notched at 21 for receiving the end of the oscillating lever 2. The notched part 21 presses against the lever 2 to an extent sufficient to maintain proper yielding contact between the cooperating cutter and face plate. The provision of the spring 20 eliminates the need of spring-pressed pins or other devices which are commonly used to maintain the cutter of a device of the type to which this invention relates in contact with the underside of the face plate.

Figure 6 illustrates a modified form of face plate 22 which differs from the face plate previously described in that the intermediate cutter bars 23 and 24 of the face plate are unsupported at their outer ends and also in that the cutter bars 25 and 26 at the opposite edges of the face plate both point in the same direction which corresponds to the direction in which the intermediate cutter bars 23 and 24 point.

Figure 7 illustrates a movable cutter 30 which may be used in connection with the face plate shown in Figure 6. This cutter is in the form of a corrugated plate of similar configuration to the face plate 22 and it is provided with four series of freely projecting, pointed cutter bars 31, 32, 33 and 34, which are adapted to cooperate with bottom edges of the cutter bars 23, 24, 25 and 26 of the face plate 22, after the manner previously described in connection with the species of the invention first described.

Figure 9 illustrates another modification of the invention in which the face plate 40 may correspond to either one of the face plates previously described. In this species of the invention the movable cutter 41 is provided with four series of relatively short, pointed teeth 41, 42, 43 and 44 which sweep across a portion at least of the slots of the face plate 40.

The cutter member 41 is corrugated somewhat differently from the face plate so that the toothed portions only of the cutter member contact with the face plate as is clearly illustrated in Figure 9. The cutter member 41 is designed so that it may be formed from a sheet-metal stamping without requiring the need of expensive and tedious milling or cutting operations to form the teeth of the cutter.

In the form of the invention illustrated in Figure 11, the device is provided with a hollow handle formed from mating halves 70 and 71 for the housing of a motor (not shown). The motor is provided with a manually operable starting wheel 72 which is carried by the armature shaft 74 of the motor. The shaft 74 is provided with an eccentric pin 75 at its outer end.

The pin 75 is received in a slotted bearing member 74a attached to a relatively thin cutter plate 77, the ends of which are bent-over at 76 and slotted at 76a to form a series of cutter bars which cooperate with a folded-over sheet metal guard member 78, the edges of which are slotted at 80 to form a series of cutter bars which cooperate with the slotted portions of the cutter. The contiguous edges of the guard member may be welded to each other as indicated by the numeral 73.

A rectangular opening 77a is formed at each side of the top of the guard member to facilitate the removal of hairs which are sheared off during the operation of the device and similar openings (not shown) may be provided at the underside of the guard member if desired. The guard member 78 is provided with lengthwise extending offset portions 81 which provide space for reception of fibrous oil-retaining material 82 by means of which the cutter may be lubricated. The guard member is provided at its underside with suitable openings 84 and 85 which cooperate with rivets 86 and 87 to effect the attachment of the cutter head to the handle. This operation is facilitated by arranging the shaft 74 so that it may be axially shifted out of engagement with the cutter and the guard member.

It will be seen upon consideration of Figures 12 to 14, that after the wheel 72 and the shaft 74 are moved downwardly as far as they can go, the cutter head may be slid to the left to bring the heads of the rivets 86 and 87 into registry with the enlarged openings 84 and 85 of the cutter head whereby the same may be lifted from the handle for cleaning or other purposes.

In the modification illustrated in Figure 15, the cutter head is provided with a generally rectangular sheet metal guard member in the form of a corrugated plate 93, the individual corrugations 106 of which are provided with slots 103 extending widthwise of the plate. A similarly formed corrugated plate 94 having slots 104, constitutes a cutter which is adapted to be reciprocated in contact with the rear face of the plate 93 so that hairs projecting through the slots of the guard member will be sheared off by the cutter during its reciprocation. Springs 94a hold the cutter 94 in contact with the guard member 93.

The ends of the corrugated plate 93 are provided with laterally extending securement members which are notched at 95a and 102 for registry with securement bars 95 and 101 respectively. The bar 101 is fixedly mounted in the handle 99 of the shaver. The bar 95 is attached to one end of a lever 96 which is pivoted at 96a to the handle 99. A spring 96b is provided to urge the lever in a direction so that the bar 95 will be maintained in engagement with the notch 95a of the guard member. Removal of the guard member may be readily effected upon pressing the exposed end of the lever 96 whereupon the bar 95 will be withdrawn from engagement with the notch 95a of the guard member and the guard member then may be readily removed from the handle 99.

A notched or slotted plate 105 is attached to the rear side of the cutter 94. The notch of this plate receives the pin 108 of an oscillatable lever 109 which is pivotally mounted in the handle on a pin 110. At the end of the lever 109, remote from the pin 108, a notch or slot 111 is provided

for receiving an eccentric pin 112 which is fixed to the operating shaft 113 of the device. This shaft may constitute the armature shaft of a motor (not shown) which may be carried inside the handle 99. The numeral 114 indicates the starting wheel of the motor of this form of shaver.

The form of shaver illustrated in Figure 21 is very similar to the device illustrated in Figure 11 and it differs therefrom principally in that the slotted edge 115 of the guard member is V-shaped in cross-section instead of being of rounded construction as shown in Figure 11. A cutter 116, which is also much the same as the cutter 77, is shaped at its one edge so as to conform to the V-shaped configuration of the guard member 115.

The guard member is provided at its other side with three V-shaped corrugations 117 which are slotted in the same manner as for the edge 115 and the cutter 116 is similarly shaped at this side of the device with notched or slotted ridges 118 similar to those illustrated in Figure 18. The slots which are formed in the portions 117 of the guard member are arranged in staggered relation in the manner previously described for the form of the guard member illustrated in Figure 16.

The foregoing description and the accompanying drawings to which it relates, describes what might be termed the preferred modes of practicing the invention. It is to be clearly understood, however, that the invention includes each and every novel feature or combination of novel features herein disclosed, subject only to the restrictions of the prior art, and that the invention may assume other forms and it is not to be limited to the particular and specific structures shown and described herein.

Having thus described my invention what I claim is:

1. A corrugated face plate for a shaving device having a plurality of series of cutter bars adapted for simultaneous contact with the skin, said cutter bars being in the form of comb teeth with unsupported outer ends and projecting in the same general direction.

2. A corrugated face plate for shaving devices having a plurality of series of cutter bars adapted for simultaneous contact with the skin, the cutter bars being thinner at the point of contact with the skin than at other parts of the face plate, and pointed outwardly extending marginal cutter bars in the form of comb teeth with unsupported outer ends and projecting away from the central portion of said plate.

3. A corrugated face plate for shaving devices having a plurality of series of cutter bars adapted for simultaneous contact with the skin, the two outer-most series being in the form of pointed comb teeth with unsupported outer ends and projecting away from the central portion of said face plate, and supporting means on the ends of said face plate for said cutter bars.

4. A corrugated face plate for a shaving device having a plurality of series of cutter bars adapted for simultaneous contact with the skin, cutter bars of the innermost series being in the form of comb teeth supported at their opposite ends, and the cutter bars in the outer series projecting away from the central portion of said face plate in the form of outwardly projecting pointed comb teeth, and a cutter member having teeth adapted to traverse a portion, at least, of said cutter bars at the underside of said face plate, and means for translating said cutter member.

EDMUND J. TE PAS.