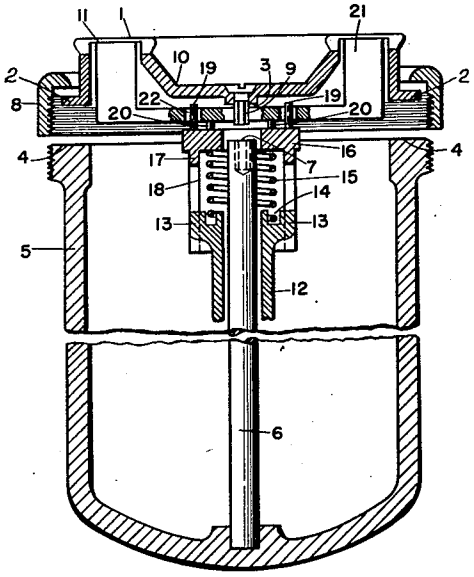
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CUTTER HEAD OF DRY-SHAVING APPARATUS

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CUTTER HEAD OF DRY-SHAVING APPARATUS

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1 Claim. (Cl. 30—43)

This invention relates to a cutter and cutting plate construction and arrangement for a dry-shaving apparatus. This application is a continuation-in-part application of my co-pending application Serial No. 680,872, filed July 2, 1946, now abandoned.

In the usual constructions of a cutter head of a dry-shaving device the cutter head is secured at the outer edge, for example by means of a nut, to a supporting body which generally is integral with the housing or the frame of the apparatus.

The invention is based on recognition of the fact that the central part of the cutting plate being highly flexible due to the minute thickness thereof is frequently liable to oscillations which detrimentally affect the cutter action and in addition may considerably shorten the life of the cutting plate on account of fatigue phenomena of the material. The oscillations are generally originated by the drive means and, particularly in systems comprising a cutter adapted to rotate about a spindle, may acquire a considerable amplitude in some cases due to resonance phenomena. Thus, for example, in a device freely rotating in the air and having a well-known type of cutting plate comprising radial slits and a central re-entrant part an amplitude of 17μ was established. In addition, due to the pressure on the skin which is continually varying, the cutting plate is liable to sag even more heavily.

According to the invention, the said disadvantages are obviated in that in a cutter head comprising a cutting plate and a supporting member for the outer edge thereof the central part of the cutting plate is also supported on the lower side in a direction normal to the plane of the cutting plate, or in some cases is secured to the support. Obviously this support and the supporting member for the outer edge form a rigid unitary piece so that the center of the cutting plate is immovably secured in place.

In addition, this arrangement of rigidly supporting the central portion of the cutting plate permits of the active apertured part of the cutting plate being given larger radial dimensions than has heretofore been used.

It is known to support the cutting plate of a dry-shaving device merely at the central part by securing it in position on a stud which across the hollow shaft of the drive bears on a rigidly mounted part of the frame or the housing of the apparatus. In this case, however, the outer edge of the cutter plate is fitted with a rim of teeth in which the ends of the teeth are free to move so that a smarting influence is exercised on the skin and the cutting plate has to be constructed so as to be thicker for considerations of mechanical strength and the rim teeth formed so as to be shorter than is generally desirable in connection with a satisfactory shaving operation. The invention does therefore not relate to a construction of this kind since the central support of the cutting plate as such is not essential on account of the support already existing at the outer edge but only serves for anchoring the cutting plate.

According to a further feature of the invention all

the supporting surfaces, consequently those at the outer edge as well as those on the central part are arranged in one plane. Even in wholesale production in mounting the cutting plate this ensures in a simple manner an accurate support or attachment without warping or flexing of the cutting plate.

In order that the invention may be clearly understood and readily carried into effect it will now be described more fully with reference to the accompanying drawing in which one embodiment of the invention is diagrammatically shown.

According to the invention, the cutting plate **1** is supported and secured both at the outer edge **2** and at the central part **3** on the lower side in a direction normal to the plane of the cutting plate, this being effected respectively by means of the edge **4** of the housing **5** and a stud **6** which is fast in the bottom of the housing and comprises a supporting surface **7**, the stud **6** being assumed as a bearing for the hollow shaft **12**.

The cutting plate is secured in position with the help of a nut **8** and a small screw **9** so that all the forces that occur in an axial direction are absorbed.

As may be seen from the figure, the supporting surfaces **4** and **7** are caused to be located in one plane, for example by cutting, so that exactly fitting surfaces are safeguarded.

The invention is of particular importance with constructions in which use is made of a cutting plate comprising a central re-entrant part **10** and radially or tangentially directed slits **11** of relatively large length since this construction has been found to be highly sensitive to the said vibration.

As seen in the drawing the cutter **21** is urged against the cutting plate **1**. The hollow shaft **12** connected to a motor (not shown) has an enlarged end thereof provided with two ribs **13**. An annular recess **14** is cut in ribs **13**. A helical spring **15** surrounds stud **6** having one end in the recess **14** and the other end urged against a member **16**. Member **16** comprises a cylindrical part **17** having two opposed grooves **18**. Ribs **13** are positioned in grooves **18**. Member **16** is therefore freely movable in an axial direction relative to the motor shaft **12**. The rotation of motor shaft **12** will cause member **16** to rotate. Member **16** is further provided with two pins **19** and two projections **20**. The cutter **21** has two holes **22** into which pins **19** project. Thus, when the cutter **21** is urged against the cutting plate **1** by the spring **15** through the member **16**, the projections **20** are urged against the cutter **21** thereby transmitting the rotational movement of the motor shaft **12** to the cutter **21** and at the same time maintaining the cutting plate **1** substantially free from oscillations or vibrations.

While I have shown and described the preferred embodiment of my invention, it will be understood that the latter may be embodied otherwise than as herein specifically illustrated or described and that in the illustrated embodiment certain changes in the details of construction and in the arrangement of parts may be made without departing from the underlying idea or principle of the invention within the scope of the appended claim.

What I claim is:

Dry-shaving apparatus comprising a cup-like housing member, a bearing shaft member secured to the bottom portion of said housing member so as to be centrally positioned therein, a cutting plate member having an outer portion thereof coupled to the wall of said housing member and a central re-entrant portion, means mounting said re-entrant portion rigidly on the top portion of said shaft member, a cutter, an intermediate member coupled to said cutter and provided with at least one slot

extending in a direction parallel to said bearing shaft member, a hollow shaft driving means surrounding said shaft member and provided with at least one rib projecting in said slot whereby rotational movement is imparted to said cutter, and resilient means positioned between said hollow shaft driving means and said intermediate member to thereby resiliently urge said cutter against a portion of said cutting-plate member.

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