Oct. 10, 1950 W. J. NEIDIG 2,524,822

SHAVING MECHANISM

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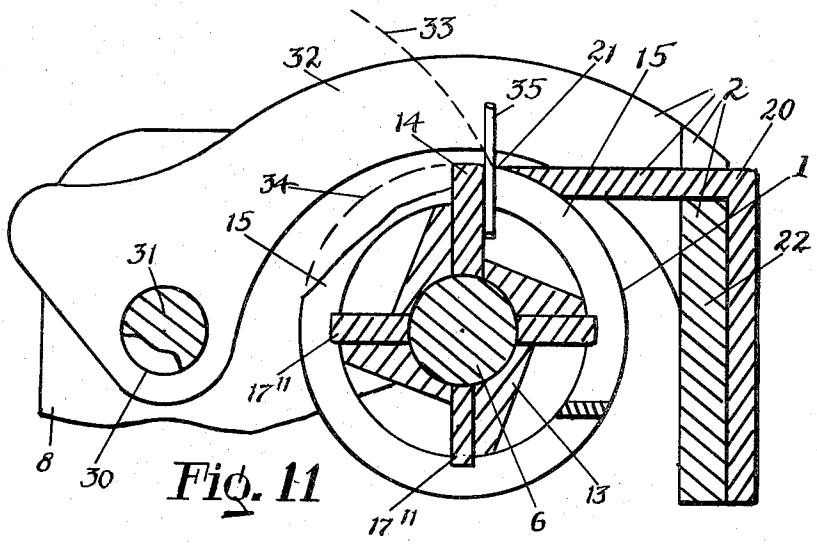


Fig. 11

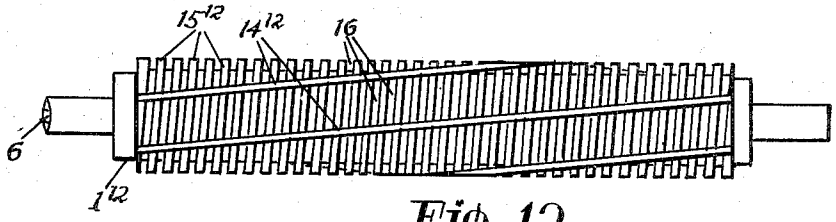


Fig. 12

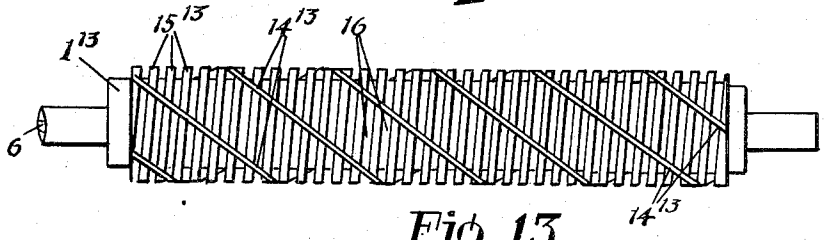


Fig. 13

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SHAVING MECHANISM

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Application March 20, 1946, Serial No. 655,813

12 Claims. (Cl. 30—43)

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The invention herein described relates to the class of shaving mechanisms in which movable and stationary cutting elements cooperate in a shearing action, more particularly when the movable element is rotary.

In practice, as is well known, power-driven shaving mechanisms commonly employ some form of reciprocating actuation, rather than rotary, the movable cutting element being oscillated rapidly to and fro in sliding contact with the stationary. This sliding contact is commonly maintained by means of yielding spring pressure or its equivalent, the pressure being directed against one of the cutting elements to urge it toward the other, as in the familiar hair clipper family. The heavier the cutting, the stronger the spring pressure needed. For the cutting edges of shearing cutters necessarily slide past each other at different levels and the cutting action tends to separate them. The spring pressure must be strong enough to hold the cutters in contact under all the stresses of use; otherwise the cutting action will now and then spring them apart, and they will draw the beard-ends or hair between them and cause pain.

Such shearing elements must likewise be held in contact by adequate means when one of them is rotary, and for the same reason. The stresses of use vary greatly. Cutting edges get dull, increasing all stresses. The spring pressure employed must be strong enough to withstand all these. Yet at desirable rotary speeds such pressure may cause excessive friction and objectionable heat. This practical consideration of the heat of friction is one of the factors making for the larger use of reciprocating actions, for in them the to-and-fro throw of the movable cutting element is small and the friction factor low. Even in them the heat of friction in some cases may become objectionable.

One of the objects of my invention is to reduce this rotary friction factor, namely by providing pressure-forces to hold the shearing elements in contact that automatically vary with their need, instead of remaining at a predetermined constant level above some safety minimum.

Another of my objects is to provide pressure-forces that automatically cease to act in the interval between the cutting actions.

Another of my objects is to further reduce the rotary friction factor by reducing the need of pressure-forces, namely by providing a construction that automatically resists the separation or springing apart of the shearing elements when engaged in cutting, again variably, according to

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the force resisted, without employing pressure-forces at all.

Another of my objects, in uses where spring-pressed cooperating cutters are employed, is to reduce the spring pressure required, or its equivalent, by combining my variable pressure and variable resistance devices with the spring-pressed devices.

By attaining these objects I attain other objects, namely that of increasing the life and efficiency of cooperating shearing cutters by reducing the wear upon them, that of increasing the cutting speed of a shaving mechanism employing rotary cutters, and that of reducing the power needed for the operation of such a mechanism and therefore the size of the motor.

Among my further objects is to provide a construction for a shaving mechanism whereby the stationary cutting member can be readily lifted back from the rotary for inspection, cleaning or blade renewal purposes, and as readily replaced, at a touch, without adjusting, and to provide a latch for such a construction latching it against accidental displacement, thereby increasing the convenience and safety of the mechanism as a whole.

As one of my objects, I also provide an improved blade-replacing construction, and an improved form of cutting blade for ready removal or replacement by the average user.

Still a further object is to provide an improved rotary cutting and supporting member in a construction that is economical to manufacture and effective in use.

Other objects are as hereinafter explained.

I attain these objects through the invention described herein, embodiments of which are illustrated in the accompanying drawings. In these—

Fig. 1 is a plan view of an embodiment shown as connected to a common form of power drive.

Fig. 2 is a sectional end elevation of parts of the same, greatly enlarged, on the line 2—2, Fig. 1.

Fig. 3 is an end view of the same, similarly enlarged.

Figs. 4 and 5 illustrate other forms of parts shown in Fig. 2, on the same scale and in similar sectional end elevation, with portions of the structure removed or broken away.

Fig. 6 is a detail view, partly broken away or in section, of the rotary member employed in the earlier figures to illustrate the invention, on the same scale as Figs. 2 to 5.

Fig. 7 is a detail view, not so greatly enlarged, of the removable stationary cutting blade shown in Figs. 2 to 5.

Figs. 8 to 11 are representations, chiefly diagrammatic, illustrating the action of the mechanism shown in the earlier figures.

Figs. 12 and 13 illustrate other forms of rotary cutting member 1.

The mechanism illustrated in the drawings embodies cutting and skin-supporting constructions described and claimed more broadly in my United States Patent No. 2,367,686, dated January 23, 1945, and in my co-pending application for patent, Serial No. 572,807, filed January 15, 1945, now abandoned.

The invention described herein comprises cooperating rotary and stationary cutting members having cutting positions in shearing adjacence, and it comprises positioned devices supporting the stationary member in special ways.

In the drawings, a rotary cutting member is indicated at 1 and a stationary cutting member at 2, the rotary member being driven by a conventional motor the casing of which is indicated at 3 and the electrical connections at 4. Rotor shaft 5 of the motor, journaled in casing 3, is extended into or connected drivingly to axle 6 of member 1, axle 6 being journaled at one end in frame-plate 7, attached upon casing 3, and at the other end in frame-plate 8. Frame-plates 7 and 8 are conveniently combined with strut 9 through bolt 10 and nut 11 to form a frame-extension upon casing 3 for the support of the shaving mechanism proper, key-pins 12 entering recesses in strut 9 to maintain the parts in position.

Rotary cutting member.—Rotary member 1 may take many forms. In the drawings, one form is shown in Figs. 1 to 6, a variant upon this in Fig. 11 (partly diagrammatic), another form in Fig. 12, still another in Fig. 13. In all of the forms shown use is made of peripheral cutters and peripheral bearers, and of beard-receiving recesses spacing the bearers. The illustrations chosen exhibit what I regard as preferred forms, rather than the range of forms possible, which do not necessarily include cutters or bearers of the special forms shown, or bearers at all.

In the embodiments of the invention illustrated in Figs. 1 to 6, rotary cutting member 1, of cylindrical contour, is constructed having a body portion 13 attached upon axle 6 as by moulding, the body portion being fashioned of a material suitable for the use, such as die-casting metal or plastic. In its periphery are shown cutters 14 and skin-supporting bearers 15, the bearers being spaced by narrow beard-receiving recesses 16, and being of even height with the cutters. Cutters 14, fashioned of hard material before assembling, have the form of rectangular teeth or serrations along the edge of toothed blade 17, blade 17 being embedded longitudinally in body portion 13 by moulding or otherwise. Bearers 15 are fashioned of elongated hard material such as music wire, preferably of rectangular section, and are assembled in the notches 18 between cutters 14. In the arrangement shown in Fig. 11 only one of the notched blades bears serrations of peripheral height, the remaining blades, indicated at 17^{11}, serving as bearer supports and not as cutters. The construction is fine-ground after assembling to smooth, polished peripheral surfaces for light sliding contact with the skin and with the stationary cutting edge. The disposition of parts is such that bearers 15 form a helical pattern of low pitch in the periphery of member 1, spaced by cutters 14 and recesses 16, and cutters 14 have angular positions giving them

cutting paths that overlap. The construction gives bearers 15 a distributed supporting contact with the skin and with the stationary cutting edge, and enables them through their sliding action to assist in guiding beard-ends into recesses 16 for cutting.

Cutters 14^{12} and bearers 15^{12} of rotary member 1^{12} shown in Fig. 12 are of even height and perform the same described functions as cutters 14 and bears 15. Cutters 14^{13} and bearers 15^{13} of rotary member 1^{13} shown in Fig. 13 also perform the same described functions as cutters 14 and bearers 15.

Stationary cutting member.—The cooperating stationary cutting member 2 of the mechanism is constructed having a longitudinally-extending cutting edge adapted to engage shearingly with cutters 14, 14^{12} or 14^{13} when in cutting position. In the drawings the cutting portion of member 2 is shown as detachable for ready replacement, having the form of a replaceable blade of special design. This blade portion is indicated at 20, and the cutting edge thereon at 21. Blade portion 20 in this construction is combined upon supporting cross-portion 22 of member 2 through the clamping action of finger-nuts 23 and threaded studs 24, the studs projecting rearwardly from cross-portion 22 of member 2 through slots 25 in the blade. The slotted form of openings 25 permits the removal of the blade without removing the nuts. Blade 20 when assembled on cross-portion 22 acts as a unit with other portions of member 2 as if constructed integrally therewith. Finger-extensions 26 on either end of the blade facilitate its handling, enabling a blade to be removed or inserted in the dark, by feel alone. The angular construction of the blade adds to its usefulness. It is constructed having an L section, and comprises a plate-like edge portion 27 joined along the heel upon a plate-like downstanding portion 28. The construction provides a narrow, stiff, inexpensive, easily-handled cutting edge for member 2 that is replaceable with ease by any average user. While the replacement feature adds greatly to the usefulness of the mechanism as a whole, it is not essential to the cutting action.

Flexing devices.—The mechanism that cooperates with the rotary and stationary cutting members to perform my novel pressure functions centers upon certain movement-affording supporting constructions affording a special movement broadwise by the stationary cutting edge. These will be described. The constructions are not limited to those shown in the drawings, but are illustrated by them. As an example, the flexing constructions of the drawings in each case afford movement broadwise by the cutting edge in an arc, whereas the movement need not follow an arched path. By movement broadwise is meant a movement by the cutting edge as about an axis parallel thereto. The flexing constructions shown in Figs. 1 to 3 have the form of axle-and-bearing devices, the bearings 30 of which have positions on arms 32, shaft 31 serving as axle. The flexing devices shown in Fig. 4 are thin, strap-like portions 31^4 of forwardly-extending arm supports 32^4, fashioned of readily-flexible tension-resisting material like thin sheet metal. In Fig. 5 the flexing structure is shown as resembling that of a pin or stub axle nested in the end of a chain-link. The constructions affording member 2 the required movement broadwise may operate from a number of positions, within narrow limits. For reasons that will be

clear later I prefer to give them positions from which they support member 2 pullingly, that is to say positions forward of a line drawn perpendicularly through the shearing line along which the cutting action occurs, instead of rearwardly of it, and they are so shown in the drawings. To connect them with stationary cutting member 2 I employ forwardly-extending supporting arms, such as arms 32 (Figs. 1 to 3), arms 32^4 (Fig. 4) or arms 32^5 (Fig. 5). Whatever form they take, or whatever their position, the object of the movement-affording devices is to afford a short, free, defined movement broadwise by the stationary cutting edge in a path meeting the path of cooperating rotary cutters obliquely between certain angles.

The embodiment shown in Figs. 1 to 3, with its forwardly-extending arm supports 32 journaled upon shaft 31, will illustrate the construction and action of the mechanism. Shaft 31 is attached at either end upon frame-plates 7 and 8, in a position forward of the shearing line, and arms 32 through bearings 30 are journaled upon it as upon an axle. Arms 32 are attached upon the ends of supporting portion 22 of member 2. The position of shaft 31 is such that edge 21 is afforded movement broadwise in the path indicated at 33, which meets the path 34 of peripheral cutters 14 at the acute angle of 55° or 60°, the vertex of the angle marking the shearing line and lying in the direction of rotation of the peripheral cutters. Any movement of edge 21, no matter how small, either toward or away from cutting position, must be made in this path. The path of cutters 14, and of cutters 14^{12} and 14^{13} as well is indicated at 34 in Fig. 11. Work material, greatly enlarged, is also shown in Fig. 11, being indicated at 35.

The mechanism described cooperates to perform functions that will be explained.

1. Variable contact pressure.—In a shearing action between any movable and stationary cutting members a cutting force is exerted by the movable member upon the material being cut, and through that material upon the supporting adjacent cutting edge of the stationary member. Cutters having sharp edges require less cutting force to operate than dull ones, thin stands of beard less force than thick. This is true of the cutting forces exerted through peripheral cutters 14, and it is true of work material 35 and stationary cutting edge 21. The stationary cutter receives the exact cutting pressure expended in cutting the material, and no more. After the cut is made no further cutting pressure is transmitted.

The devices shown provide means to convert variable cutting pressure exerted by cutters 14 upon work material 35 into pressure variably pressing cutting edge 21 toward said cutters. They act as follows: The cutting force exerted by cutters 14 is transmitted through work material 35 to cutting edge 21. Cutting edge 21 being movable obliquely broadwise toward cutters 14 in path 33, and in that path only, and the pressure upon cutting edge 21 being exerted in a direction tending to move it toward cutters 14, since it is exerted off center of the axle of flexion 31, edge 21 is urged more strongly or less strongly into shearing contact by a pressure that varies with the cutting force exerted, that is to say that varies with the need. Whether great or small, the pressure thus provided will automatically reduce the need for a constant spring pressure, or eliminate it, and therefore reduce the friction of contact and its heat.

2. Range of variation.—The ratio of pressure transmitted to that exerted by cutters 14 is itself variable, although not automatically, being greater at the lower angles between paths 33 and 34, lower at the higher. The angles of 55° or 60° shown in the drawings may be increased for some uses almost to a right angle of 90°, and still remain effective. For other use they may be reduced to 20° or lower, through the use of hard, polished, rigid materials, at increased expense. In no case will the angle be so low as to cause seizing.

3. Intermittent pressure.—Not only do my devices automatically convert variable cutting pressure into pressure variably urging the cutting members together, but since the cutting pressure is intermittently exerted, the transmitted pressure is automatically applied at intervals only, still further reducing the friction of contact. The feature has the further effect of sharply decreasing the angles, from high to low, at which a seizing action may occur, thereby increasing the range of angles available.

4. Variable resistance feature.—The further function performed by the mechanism is distinct from any of those described, but cooperates with all of them in accomplishing the common objects. The devices provide an automatic, varying resistance to the separation of the cutting members during the cutting action, independently of the varying and intermittent pressures described thereby reducing the need of any pressures.

The manner in which the mechanism operates to do this can best be explained through an illustration. Attention is directed to the position of parts as shown in Fig. 11, in which the rotation of member 1 is stopped at the precise moment when cutters 14 have pressed work material 35 tightly against cutting edge 21 but have not yet sheared it off. Suppose that instead of beard the work material be regarded for the moment as consisting of incompressible hard steel wire of the same diameter, and that the mechanism is of unyielding construction, including edges 14 and 21. Suppose now that edge 21 is lifted even slightly away from cutting position. It will be apparent that if edge 21 is movable in path 33, and in that path only, any lifting of it however slight must be in a path that is partially blocked by one or another of peripheral cutters 14, since the work material is forced by the presence of the cutter 14 into encroaching upon the path that edge 21 must take. The lifting movement can be made only by backing away the blocking cutter. It will therefore be resisted by the entire force exerted through this cutter. A similar resistance will result if the work material consists of beard-ends, except that in that case it will be measured by the resistance of the work material to cutting. Whether great in degree or small, the resistance will be encountered. Even a tighter wedging of work material already compressed between the shearing cutters constitutes a resistance. Comparison is asked between this blocking action of cutter 14 and the contrasting action of the same cutter in the same position, if instead of path 33 the stationary cutting edge were movable in a path meeting path 34 at an obtuse angle, such as path O in Fig. 8. In such case the separation of the cutters would not be resisted, but facilitated.

It will be noted again that shaft 31 is shown in the drawings as having a supporting position

forward of the shearing line. While the angular relationship between paths 33 and 34 is not affected by a forward as against a rearward positioning, and I do not limit myself to either, the forward positioning shown affords movement by edge 21 in a path that is concavely adjacent to blocking cutter 14 and that is therefore more effectively blocked thereby.

It will be noted also that the movements referred to of edge 21 are small movements, the pressures referred to chiefly small pressures, the resistances chiefly small resistances.

Fold-back.—The constructions described, embracing forwardly-positioned flexing devices, perform a further function that adds to the usefulness of the mechanism as a whole, by providing a means by which the stationary cutting edge 21 can be lifted away from rotary cutting member 1 for cleaning or inspection purposes, at a touch, without altering adjustments or pressures, and then replaced at a touch, axle or shaft 31 affording the larger movement.

Positioning.—To maintain stationary cutting member 2 in operative position I make use of light springs 36, which bear upon extensions 37 on arms 32 and are fixedly attached on strut 9 on frame-plates 7 and 8. Springs 36 also serve to hold member 2 in lifted position, and in the operative position of member 2 serve to press edge 21 toward cutters 14 with constant pressure, thus acting as convenient pressure agencies in uses requiring both constant and variable contact pressure. The pressure afforded is light and is not attended with great friction. By employing other positioning agencies their use as such can be dispensed with.

Safety latch.—The safety feature provides against injury through the accidental displacement of member 2 or its cutting edge, and in addition can be used as a positioning agency. If employed with springs 36 it enables lighter springs to be used, by eliminating the safety factor. Its construction in the form shown comprises a movable latch 39 attached upon rock-shaft 40, which is journaled at either end in frame-plates 7 and 8 under the control of a friction-washer 41. The lip of the latch is indicated at 42; it projects forwardly to enter an aperture 43 in blade 20 when shaft 40 is rocked, and into a similar aperture 44 in line therewith in blade-support 22 of member 2. In addition to its use as a safety provision and as a positioning means it provides a positive means of preventing displacement of blade 20 upon supporting portion 22 through an accidental slackness of finger-nuts 23. It will be understood that the latch does not clamp edge 21 against member 1, but permits a slight free-play thereof in path 33. It is operable at a touch.

Trash receptacle.—A trash-tray 45 is provided to add to the convenience of the mechanism. It is formed of sheet metal and is removably supported upon shafts 31 and 40 by means of tongues 46 and turned-over lip 48. The tray catches beard-ends and cuttings after their centrifugal ejection by member 1.

The modifications.—The variant forms of portions of the mechanism described illustrate both its construction and its action. Thus the flexing devices of Fig. 4, comprising thin, flexible supports 31^4 connected to arm supports 32^4, perform the same flexing functions as the axle-and-bearing devices of Fig. 3. Supports 31^4 are supported by split posts 49 on frame-plates 7 and 8, and arm supports 32^4 are connected to cross-supports 22 of member 2. The flexing position in this case is established by member 1, upon peripheral portions of which the flexible devices have sliding contact. The flexing action affords stationary cutting edge 21 movement broadwise in a path meeting the path of peripheral cutters 14 at a high acute angle. The slight resilience of the flexing material in this case is employed to urge member 2 toward member 1, safety latch 39 making such positioning use practicable.

The flexing devices shown in Fig. 5 comprise arm supports 32^5 connected to cross-portion 22 of member 2, projecting pins or axles 31^5 on said arm supports, and link-shaped bearings 30^5 in raised bosses 50 on frame-plates 7 and 8, axles 31^5 being held against the working ends of said bearings through the pressure of springs 36 against arm extensions 37. The axis of flexion thus established affords movement broadwise by edge 21 in a path meeting the path of peripheral cutters 14 at an acute angle. The construction enables member 2 to be removed or replaced as a unit, arms and all, without the use of tools, an advantage, in some uses, in addition to performing the variable pressure and variable resistance functions described.

The variant forms of rotary member 1 shown in Figs. 12 and 13 at 1^{12} and 1^{13} are described and claimed more broadly in my patent and copending application for patent earlier referred to. In Fig. 12 peripheral cutters 14^{12} are shown as extending obliquely along member 1^{12}, flush with and interrupting bearers 15^{12}. In the construction shown in Fig. 13, cutters 14^{13} are shown as extending obliquely along rotary member 1^{13} embedded transversely of bearer surfaces 15^{13} at even height therewith or very slightly higher. In both cases the cutters and bearers perform the functions of cutters 14 and bearers 15, and either rotary member can be substituted for rotary member 1.

Operation.—The mechanism described can be employed using any convenient shaving stroke, straight or diagonal, either with edge 21 leading or with it trailing, without danger of injury. The bearers are preferably disposed obliquely as shown in order to distribute their slight friction over changing surfaces, but need not be. In the forms shown, as the narrow stationary blade passes over the face the bearers weave across the skin surfaces, supporting them at cutting level, at the same time marshaling beard-ends into recesses 16 for cutting, and cutters 14 cooperate with edge 21 in the cutting action at skin level; whereupon cutting members 1 and 2 are automatically urged together during the cutting moment, intermittently, again and again, with the pressure needed, and their separation is independently resisted, again automatically and intermittently. If member 1 be left running even at high speed between strokes no heat of friction results, except that due to the pressure of the positioning spring, which is slight, and which can be eliminated by employing the safety catch as a positioning agent. This is not true of devices employing constant spring pressure. The decrease in wear makes possible the use of a thin cutting edge like edge 21 in practice, and at skin level, at any desired high speed. The mechanism works evenly, leaving no swatches of beard uncut, and its narrow form enables it to be used with ease in places not readily accessible to broader cutting blades.

Having clearly described my invention, I claim as new and desire to secure by Letters Patent:

1. In a shaving mechanism comprising cooperating revoluble and stationary shear members supported in line contact and operating means therefor, in combination: cooperating shear members adapted to operate in contact line adjacence in sliding relationship, one of the members being revolubly supported upon bearing devices and one being stationary, the revoluble member being connected to rotating means, said members having cooperating cutting portions thereon and having contact portions flush with the cutting portions, the cutting portions of the revoluble member having edges facing in movement direction; and means adapted to urge one of the members toward the other with pressure variably increasing with the cutting resistance, said means including hinged devices connected to one of the members, the hinged devices having supporting pivot portions affording movement broadwise by the cutting portions of the member in a path meeting the surface of the cooperating sheer member at an angle acute thereto, thereby responsively directing portions of the cutting force upon the contact relationship of the shear members.

2. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: rotary and stationary cutting members in contact shearing adjacence; and means urging one of said members toward the other with increased pressure during the cutting action, said means including edged cutting structure on the rotary member, a longitudinally-extending cutting edge on the stationary member, and movement-affording supports connected to the stationary member, said supports having positions affording movement broadwise by the stationary cutting edge in a path meeting the path of the rotary cutting structure at an acute angle the vertex of which lies in the direction of rotation of said structure.

3. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a rotary cutting member having peripheral cutters thereon; an edged stationary cutting member having a cutting position in shearing engagement with the peripheral cutters; and hinged devices supporting the stationary cutting member in cutting position, said devices having positions affording movement broadwise by the stationary cutting edge in a path meeting the path of the peripheral cutters obliquely, at an angle under 90° but not under 20°.

4. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a rotary cutting member having peripheral cutters thereon; a stationary cutting member having a cutting position adjacent to the path of said cutters; and axle-and-bearing devices connected supportingly to the stationary member, said devices having positions affording movement broadwise by the cutting edge of the member in a path meeting the path of the peripheral cutters obliquely, at an angle under 90° but not under 20°.

5. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: rotary and stationary cutting members mounted in shearing adjacence; and means variably resisting the separation of said cutting members, said means including peripheral cutters on the rotary member, a longitudinally-extending cutting edge on the stationary member, arm supports extending forwardly from either end of the stationary member beyond the cutting edge, and hinged devices connected to the arm supports, said devices having positions affording movement broadwise by the stationary cutting edge in a path variably blocked by the peripheral cutters while cutting.

6. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a rotary cutting member having peripheral cutters thereon; a stationary cutting member having a longitudinally-extending cutting edge and having arm supports at either end extending forwardly beyond the cutting edge; and axle-and-bearing devices connected to the arm supports, said devices having positions affording movement broadwise by the cutting edge in a path meeting the path of the peripheral cutters at an acute angle.

7. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a rotary cutting member having peripheral cutters thereon; a stationary cutting member having a longitudinally-extending cutting edge and having arm supports at either end extending forwardly past the cutting edge; spring devices urging the cutting edge toward the peripheral cutters; and axle-and-bearing devices connected to the arm supports, said devices having positions affording movement broadwise by the cutting edge in a path meeting the path of the peripheral cutters at an angle under 90°.

8. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a rotary cutting member having peripheral cutters thereon; a stationary cutting member having a longitudinally-extending cutting edge and having arm supports at either end extending forwardly beyond the cutting edge; and supporting devices having portions fashioned of thin flexible material connected to the arm supports, said devices having positions affording movement broadwise by the cutting edge in a path meeting the path of the peripheral cutters at an acute angle.

9. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a stationary cutting member having a longitudinally-extending cutting edge, and having forwardly-extending arm supports at either end, and having bearing devices on said arms, said bearing devices having bearing surfaces in positions forward of and parallel to said cutting edge, whereby to change the direction of the cutting pressure exerted thereon.

10. In a shaving mechanism comprising cooperating rotary and stationary cutting members and supporting structure therefor, in combination: a stationary cutting member having a longitudinally-extending cutting edge and having forwardly-extending arm supports at either end, and axle devices projecting from said arm supports, said devices having axis positions forward of and parallel to said cutting edge, whereby to change the direction of the cutting pressure exerted thereon.

11. In a shaving mechanism comprising cooperating rotary and stationary cutting members

and cutting structure therefor, in combination: a stationary cutting member having a longitudinally-extending blade-supporting portion, threaded studs thereon, a removable blade of L section having openings in the downstanding wall portion for the studs, forwardly-extending arm supports at either end, and flexing devices connected to the arm supports, said devices having a longitudinally-extending axis of flexion.

12. As an article of manufacture, for use in a shaving mechanism employing cooperating rotary and stationary cutting members: a cutting blade of L section having a plate-like longitudinally-extending edged portion angularly joined upon a longitudinally-extending plate-like wall portion, the wall portion having openings therein for projecting studs.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,174,706	Fusch	Mar. 7, 1916
1,730,004	Gregson	Oct. 1, 1929
1,886,273	Thomson	Nov. 1, 1932
1,981,202	Shipman	Nov. 20, 1934
2,186,092	Benner	Jan. 9, 1940
2,319,916	Breitenstein	May 25, 1943
2,367,686	Neidig	Jan. 23, 1945

FOREIGN PATENTS

Number	Country	Date
204,018	Switzerland	July 1, 1939