Dec. 4, 1934. A. UNDERWOOD 1,983,420

TRIMMING DEVICE

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Fig. 1

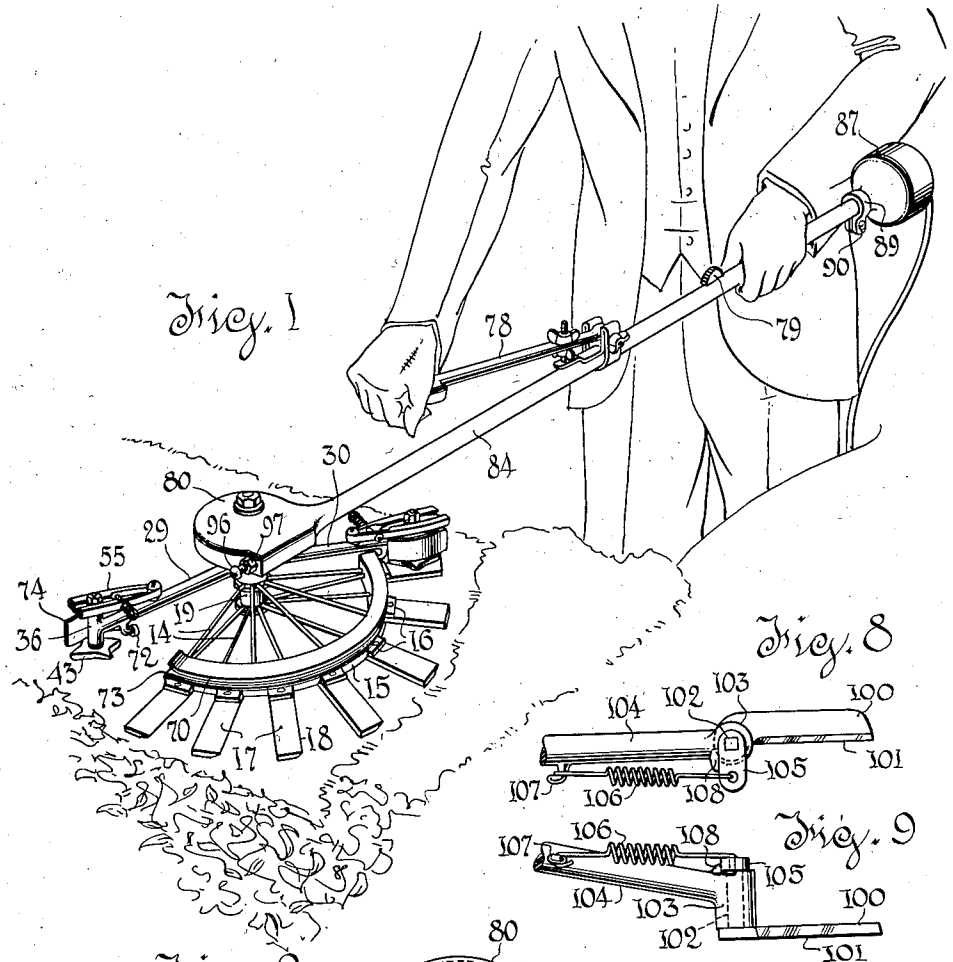


Fig. 8

Fig. 9

Fig. 2

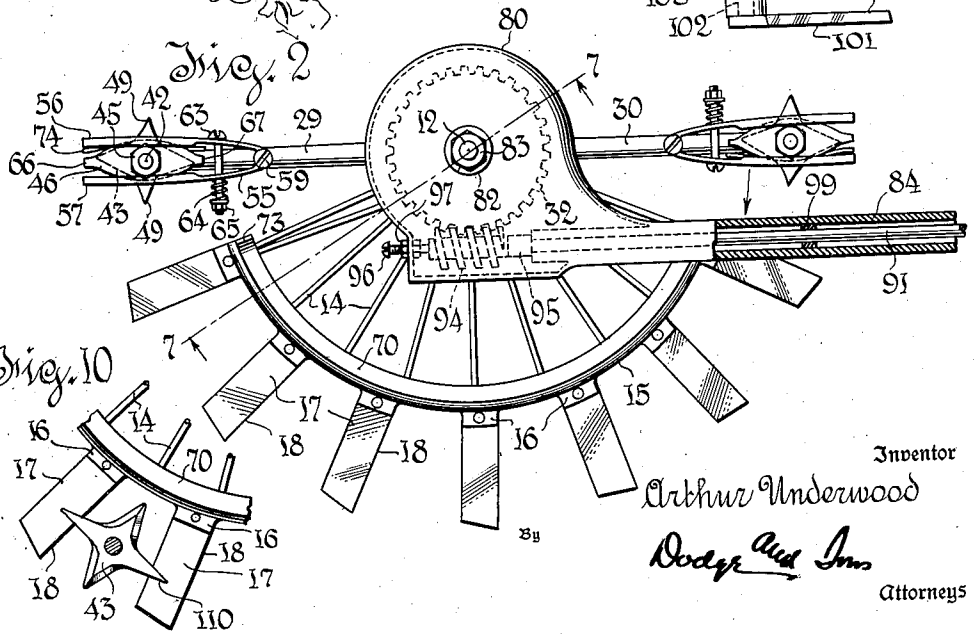


Fig. 10

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TRIMMING DEVICE

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Fig. 1

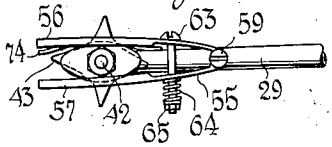


Fig. 3

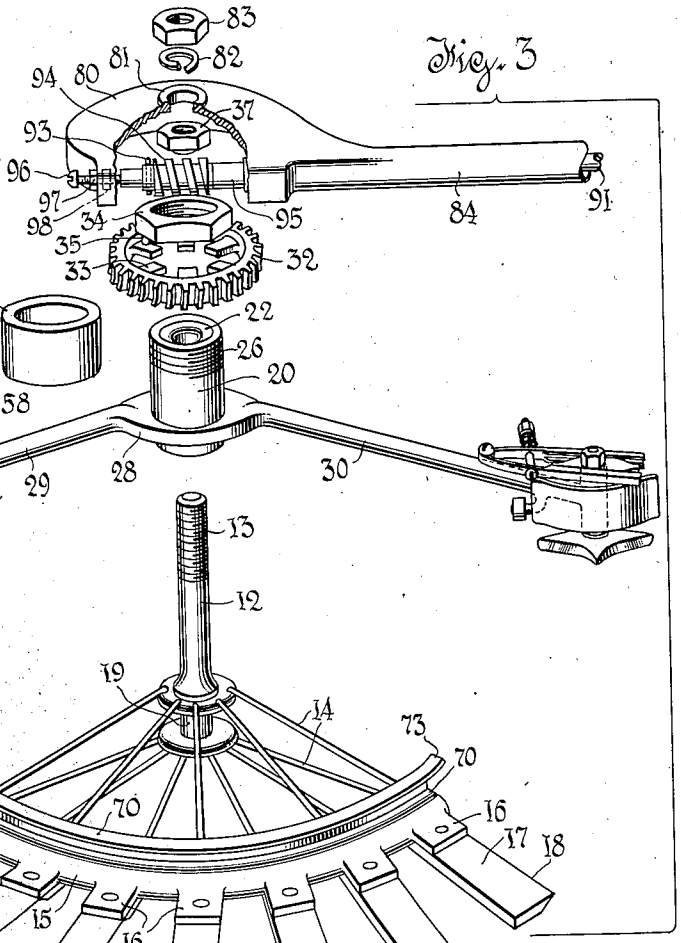


Fig. 6

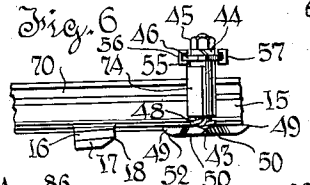


Fig. 7

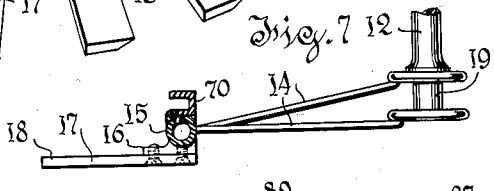


Fig. 4

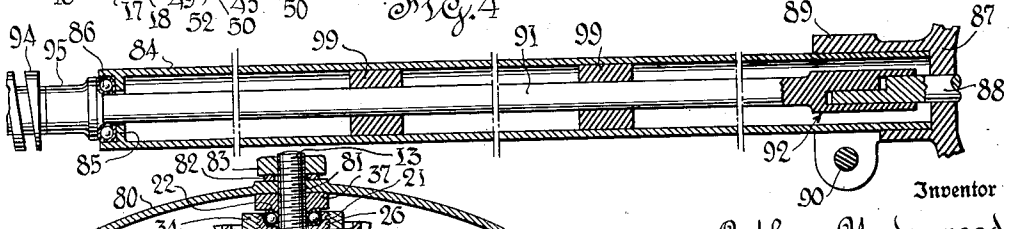
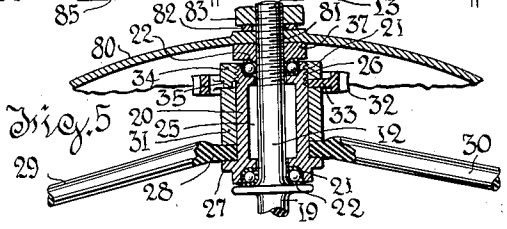


Fig. 5



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UNITED STATES PATENT OFFICE

1,983,420

TRIMMING DEVICE

Arthur Underwood, Washington, D. C.

Application February 23, 1932, Serial No. 594,726

24 Claims. (Cl. 30—11)

This invention relates to trimming devices, and more particularly to a hedge cutter which is suitable for use with shrubbery of all kinds.

One object of this invention is to provide a hedge trimming device which will sever stems of varying sizes. A hedge which has had a number of years' growth comprises both small stems which can readily be cut, and large stems which offer considerable resistance. Unless some means is provided to allow the cutting blade to yield when a heavy stem is encountered, the machine will occasionally be brought to a sudden stop with resultant damage to the parts. The present invention includes a yielding mounting for one blade or set of blades, so contrived that, when the blade yields, it is positioned for a draw cut, and thus in one or more operations severs the heavy stem.

In conventional hedge cutters, the falling of the cut ends of the hedge (particularly new growth) back upon the hedge, obscures the cut and overloads the cutters. This invention provides simple means to sweep the cut ends away from the hedge, as an incident to the cutting operation.

In the usual type of hedge cutter, there is a large area of contact between the hedge and the cutter frame. As the cutter is advanced, portions of the hedge are displaced from normal position and are cut when so displaced. Since the degree of this displacement necessarily varies with the stiffness of the stems, the cut surface will not be uniform. With the device of this invention, the contact with the hedge is only at the cutting edges. Thus, the hedge remains in its normal position while being cut.

In the usual trimming device, the blades operate at high speed. The result is that the hedge stems do not have time to enter freely between the blades and assume their normal position before they are cut. The device of this invention operates at a relatively low speed and avoids this difficulty, without however limiting the cutting capacity of the machine.

Another feature of this invention is the limitation of the contact between blades, to minimize the accumulation of gummy deposits which would overload and slow up the machine. The inclination of the stationary blades so that only the edge is presented to the moving blades is the preferred means adapted to this end.

Difficulty is experienced in the usual trimming device with occasional wedging of a stem between the cutting blades. To avoid this, the blades in the machine here disclosed are so mounted that they may separate and clear themselves.

An important characteristic of the present invention is the use of a greater number of stationary blades than of movable blades, and in the location of the stationary and moving blades so that an interval of time is allowed after each sweep of a moving blade across the series of fixed blades.

The device is so arranged that it balances in the hands of the operator both longitudinally and laterally, and thus minimizes fatigue. Vibration is minimized by balancing the moving parts.

The device may be readily assembled and disassembled.

In the accompanying drawings:—

Fig. 1 is a perspective view of one embodiment of my invention in operation;

Fig. 2 is a plan view of the cutter assembly with a portion of the tubular handle broken away;

Fig. 3 is a perspective view of the cutter showing the components separated but indicating the order of assembly;

Fig. 4 is a longitudinal section of the tubular member enclosing the drive shaft, portions being broken away;

Fig. 5 is an axial section through the central bearing assembly;

Fig. 6 is a fragmentary end view of a stationary blade and an approaching moving blade;

Fig. 7 is a section through the frame on the line 7—7 of Fig. 2;

Fig. 8 is a plan of a modified form of pivotable blade assembly;

Fig. 9 is an elevation of the same;

Fig. 10 is a plan of another modified form of a moving blade, showing its relation to fixed blades; and

Fig. 11 is a fragmentary plan view showing a modified form of cam.

Referring first to Fig. 3, the frame comprises a hub 19 having an axially projecting journal 12 which is threaded at its upper end 13. Supported by splayed spokes 14 from the hub 19 is an arcuate member 15 which is preferably tubular. As best shown in Fig. 7, the arcuate member 15 lies in a plane perpendicular to the axis of the journal 12 and is offset from the hub in a direction opposite to the journal 12. The arcuate member 15 is provided on its under surface with a plurality of substantially radially-extending lugs 16. Bolted or otherwise attached to each lug is a corresponding blade 17 having a cutting edge 18. It will be noted from Fig. 6, that the lugs 16 are inclined or otherwise disposed with respect to the plane of the arcuate member, so as to bring the back

of the blade lower than the cutting edge 18. The purpose of this will be explained.

A frame constructed in the above manner has a number of desirable features. It presents a frame which is light in weight and rigid, and which permits the surface just trimmed to be visible to the operator. The offset relation of the blades with respect to the hub brings all parts of the frame out of contact with the hedge when the blades are in cutting position. Consequently, the hedge remains in its normal position while being cut. Since the blades are removable, replacement of defective ones is facilitated.

Mounted to rotate upon the journal 12 is a carrier having a cylindrical bearing sleeve 20. Within the sleeve and near each end are channels to receive ball bearing units made up of ball races 21 and 22 and bearing balls. The chamber 25 between the races may be packed with a suitable lubricant. The bearing sleeve 20 is threaded at one end, as shown at 26, and has an external annular flange 27 near the opposite end.

Mounted upon the sleeve 20 and against the flange 27 is an annular hub 28 having oppositely disposed arms 29 and 30, which extend substantially radially and obliquely from the plane of the hub. A spacer 31 abuts the upper face of the hub 28 and supports at its opposite end a worm wheel 32. To hold these parts assembled, a nut 34 is screwed on the threads 26. This nut 34 has a depending pin 35 on its under surface, which projects between two of the spoke-like lugs 33 within the worm wheel 32. Rotation of the worm wheel in the operative direction tends to screw the nut 34 in a tightening or clamping direction.

Referring particularly to Fig. 5, the outer race 22 of the lower ball bearing lies adjacent a shoulder on the hub 19, and the outer race 22 of the upper ball bearing engages a nut 37 screwed on the threads 13. The double ball bearing arrangement thus produced is of the combined radial and thrust variety.

Since the elements carried by both arms 29 and 30 are identical, only those on one arm need be described. Carried by each of the arms 29 and 30 so as to pass approximately over the mid-length of blades 17, is a bearing 36 the axis of which is parallel with the axis of the journal 12. Mounted for rotary and longitudinal motion within the bearing 36, is a journal pin 40. This pin has a central reduced portion 41, to hold lubricant, and has a reduced threaded extension 42. To the lower end of the pin 40 is fixed a blade 43, and fixed to the upper end by means of a lock washer 44 and nut 45 is a cam 46. It will be seen that the cam abuts the shoulder 47 at the junction of the threaded extension 42 and the pin 40.

The distance between the blade and the shoulder 47 against which the cam 46 abuts, is slightly greater than the length of the bearing 36. Thus, the pin assembly is allowed a limited axial movement. A spiral spring washer 48 on the pin 40 is disposed between the blade 43 and the under surface of the bearing 36 to urge the blade 43 toward blades 17. Normally, the blade 43 will remain in its outward position, but it can yield to clear itself.

The journal pin 40 is fixed to the blade 43 at approximately the middle of the blade. The blade 43 is double-sided to provide two distinct cutting faces. Each cutting face is V-shaped with the point 49 projecting away from the blade. Adjacent the point 49, each cutting face is curved to merge into the approximately straight cutting edges 50 and 51. When one cutting face becomes dulled, the blade 43 may be turned around to present the other cutting face.

In the normal position of the blade, the leading point 49 lies on the arc traced by the center of the journal pin 40. To hold the blade impositively in this position, spring means act on the cam 46. A U-shaped resilient member 55, the legs 56 and 57 of which are channeled, straddles the cam. At the junction of the legs, the U member 55 is formed with a hole 58 to receive machine screw 59, which passes through the member 55 and into the threaded aperture formed in a boss 60 on the arm 29. This positions the legs 56 and 57 with respect to the cam 46. The legs 56, 57 are apertured at 61 and 62 to receive a bolt 63. To urge the legs toward each other, and urge them toward the cam 46, a coiled spring 64 surrounds the bolt 63 between the leg 57 and the adjusting nut 65.

In ordinary cutting, the spring legs 56 and 57 acting on the cam will maintain the blade 43 in normal cutting position and stems will be severed by nearly direct shear. However, if a heavy stem is encountered, the blade 43 will yield and rotate about its journal pin 40 to an inclined position. In thus turning, and because of the continued forward movement of the blade, the cutting edge will make a draw cut on the stem. Until the stem is completely severed, it is subjected to repeated draw cuts in this manner. Thus, instead of being brought to a sudden stop by a large stem, the device of this invention automatically changes from a direct shear cut to a slicing or draw cut. The curved portion of the cutting blade will carry a large stem toward one end of the blade, where, because of the larger moment arm, the blade will more readily be rotated about its journal pin.

The blade is pivoted at its central point because there will then be a tendency to maintain the blade in normal position because of balanced cutting on the opposite end portions. It is only when a large stem is encountered on one of the cutting edges that the blade yields. The restoring force acting on the blade is adjusted by the nut 65. To limit the extent of rotation of the blade, the cam 46 is provided with end lugs 66 and 67, which on striking the legs 56, 57 will prevent further yielding. It will be observed that because of the elliptical shape of the cam 46, the restoring force increases with the extent to which the blade yields. Consequently, the greater the yield of the blade, the greater is the effect of the slicing or draw cut on the stalk.

Practical use of this device has shown that the end lugs 66 and 67 may be dispensed with, as shown in Fig. 11, and the blade allowed to rotate 180° upon yielding. If this is done, the cutting faces of the blade 43 will alternately lead after such rotation. Neither the direct shear action nor the draw cut action will be impaired.

An important feature of the structure so far described is the provision for preventing gumming by the elimination of any continuous contacting surfaces adjacent the cutting members. It will be seen that there is intermittent contact of the moving blade with the edge only of successive stationary blades.

To insure the passage of the moving blade over the stationary blade, the under surface of the point 49 of the blade 43 is beveled, as shown at 52 in Fig. 6. This inclined portion rides over the cutting edge 18.

To further insure accurate spacing of the moving blades with respect to the stationary blades,

an arcuate shaped guideway 70 may be provided adjacent the stationary blades. As here shown, this is a channeled member secured to the upper surface of the arcuate member 15. If the guideway is used, an arm 71 carrying a roller 72 is secured to the arm 29, and coacts with the guideway. To facilitate its entry, the ends of the guideway are flared as at 73. It has been found by practical use of the device that this guideway and cooperating rollers are not essential.

A plate 74 is affixed in any suitable manner, for example by welding, to the forward face of the cylindrical bearing sleeve 36. This plate carries away the cut ends of hedge and prevents their falling back on the hedge surface.

With the above arrangement of cutting elements, only one stationary and one moving blade is acting at a time. With two diametrically disposed moving blades, as here shown, and with the stationary blades lying within less than 180° of arc, one moving blade is free while the other is cutting. This is desirable, as it affords an interval of time between successive cuts during which the device may regain momentum, and the hedge stems may enter between the fixed blades.

As has been stated, the leading point 49 of the blade 43 lies in the path of travel of the center of the journal pin 40. Since the blade 43 is symmetrical about its minor axis, this is attained by slightly inclining the blade from a radial position, as indicated in Fig. 2. A line drawn through the longitudinal axis of the blade will pass to one side of the axis of the journal 12. Accordingly, the blades 17 are normally slightly inclined from a radial position, as shown in Figs. 2 and 3, to ensure balanced cutting on the edges 50 and 51. As here shown, the projection of the edge 18 will pass the same distance to the side of the axis of the journal 12 as does the line drawn through the longitudinal axis of the blade 43.

A cap member 80, having a central aperture 81 to receive the journal 12, is secured against the nut 37 by a lock washer 82 and a nut 83. Extending tangentially from the cap member 80 is a tubular handle member 84. Within the end of the tube 84 adjacent the cap member, is an internal flange 85 which forms a recess to receive the races of ball bearing 86.

Secured to the opposite end of the tubular member 84 is an electric motor having a case 87 and shaft 88. The case 87 is provided with a split sleeve extension 89 adjacent the shaft 88, which slips over the tubular member 84 and may be clamped around it by means of a bolt 90.

A shaft 91 extends through the tubular member 84 and is provided with any suitable coupling, such as the socket coupling 92, which may be readily engaged with and disengaged from the motor shaft 88. To prevent whipping of the shaft 91, a plurality of plain bearings 99 may be spaced within the tubular member 84. Secured to the end of the shaft 91 within the cap member 80 by means of a pin 93 is a worm 94. This worm meshes with the worm wheel 32 to drive the moving blades. A spacing sleeve 95 is located between the worm 94 and the ball bearing 86 to transmit the axial thrust on the worm to this bearing. As here shown, the bearing 86 is of the combined radial and thrust type. An adjusting screw 96 and lock nuts 97 and 98, are arranged in axial alignment with the shaft 91, the screw acting in thrust to keep the worm in position.

As shown in Fig. 1, the tubular member 84 serves as a handle. It may be provided with an adjustable handle 78 to enable an operator to trim hedges of different heights without stooping. If desired, more than one such handle may be provided. Also, the tubular member 84 has a switch 79 conveniently located near one hand and controlling the motor.

By the arrangement of the cutting means with respect to the tubular member 84 and by the location of the motor at the opposite end of the handle, static balance of the parts is attained which is an important factor in eliminating fatigue arising from use of the device. The motor approximately balances the cutting assembly at the opposite end of the tubular member.

Referring to Fig. 2, it will be noted that the tubular member lies between the central bearing and the major portion of the stationary blades. The effect is that the mass adjacent the central bearing is approximately balanced by the mass of the arcuate member 15 and blades 17, and the cutter structure is underslung. Consequently, the device will remain in the position shown in Fig. 1, without effort on the part of the operator to hold it in position. This lateral balance of the assembly minimizes fatigue.

In the modification shown in Fig. 8, the journal pin 102 is located at one end of the blade 100. This pin is mounted in a bearing 103 at the end of the arm 104. With this structure, the arm 104 is shortened to bring the cutting edge 101 into coacting relationship with the stationary blades along their full lengths. An arm 105 secured to the upper end of the journal pin 102 extends at right angles to the blade 100. A spring 106 extending between the hook 107 on the arm 104 and the arm 105, urges the blade 100 to operative position. The arm 105 abuts a lug 108 on the bearing member 103 to limit the movement of the blade toward normal position. A balanced blade is, however, preferred.

The modified form of moving blade shown in Fig. 10, may be used when the guideway 70 is dispensed with and the stationary blades are relatively close together. The points of the usual blade are elongated to form tips 110 which extend a sufficient length to bridge the space between adjacent blades. Thus, it is insured that the moving blade will ride over the successive stationary blades.

In certain of the claims the motor is described as mounted at the opposite end of the frame from the cutting head. While I show and prefer an arrangement in which the motor is actually at the extreme end, the important thing is that the structure be so arranged that the motor balances the cutting head, and the location of the motor strictly at the end of the frame is not an essential feature. Consequently, the descriptive phrase in the claims is used in a general and not in a limiting sense.

What is claimed is:

1. In a hedge trimmer, the combination of a fixed blade; a moving blade coacting therewith; a rotary carrier; and a pivotal connection between said moving blade and said rotary carrier, the axis of said pivotal connection being substantially at midlength of the cutting edge of the moving blade and substantially normal to its plane of rotation.

2. In a hedge trimmer, the combination of a fixed blade; a moving blade coacting therewith; a rotary carrier; a pivotal connection between said moving blade and said rotary carrier, the axis of said pivotal connection being substantially at midlength of the moving blade and substantially normal to its plane of rotation; and yielding

means comprising a double-acting cam and spring mechanism, serving to position said moving blade on said carrier and capable of yielding to permit it to rotate thereon in either direction.

3. In a hedge trimmer, the combination of a fixed blade; a moving blade coacting therewith; a rotary carrier; a pivotal connection between said moving blade and said rotary carrier, the axis of said pivotal connection being substantially at midlength of the moving blade and substantially normal to its plane of rotation; and yielding means serving to establish a normal position of said moving blade on said carrier, the blade being formed with two angularly disposed cutting edges, and serving to produce a draw cut when rotated from its normal position.

4. The combination of a supporting frame; an arcuate blade carrier offset from said frame, there being a journal between said frame and said blade carrier, said journal sustaining the blade carrier; a series of fixed blades mounted in spaced relation on said arcuate carrier; a rotary blade carrier mounted on said journal; at least one blade rotatably mounted on said rotary carrier on an axis substantially parallel with the axis of said journal; and yielding means for impositively retaining the last-named blade in a normal shearing position, and capable of permitting it to yield to increase the drawing action of the blade in cutting.

5. The combination of a supporting frame; an arcuate blade carrier offset from said frame, there being a journal between said frame and said blade carrier; a series of fixed blades mounted in spaced relation on said arcuate carrier; a rotary blade carrier mounted on said journal; at least one blade rotatably mounted on said rotary carrier on an axis substantially at the midlength of the blade and substantially parallel with the axis of said journal; and means including a cam and coacting resilient arms for impositively retaining the last-named blade in a normal shearing position and capable of permitting it to yield in either direction, to increase the drawing action of the blade in cutting.

6. The combination of a supporting tubular bar; an arcuate blade carrier offset from one end of said bar, there being a journal between said bar and blade carrier, said journal sustaining the blade carrier, a series of fixed blades mounted in spaced relation on said arcuate carrier, a rotary blade carrier mounted on said journal, at least one blade mounted on said rotary carrier and coacting with said fixed blades; a motor mounted at the other end of said bar; driving connections from said motor to said rotary carrier extending through said tubular bar, the parts being so arranged that the device as a whole is in stable equilibrium in position to cut in a horizontal plane, when supported at a point near the midlength of said bar; and a controller for said motor, mounted on said bar adjacent said point of support.

7. The combination of a supporting tubular bar; an arcuate blade carrier offset from one end of said bar, there being a journal between said bar and blade carrier, said journal sustaining the blade carrier, a series of fixed blades mounted in spaced relation on said arcuate carrier, a rotary blade carrier mounted on said journal, at least one blade mounted on said rotary carrier and coacting with said fixed blades; a motor mounted at the other end of said bar; driving connections from said motor to said rotary carrier extending through said tubular bar, the parts being so arranged that the device as a whole is in stable equilibrium in position to cut in a horizontal plane, when supported at a point near the midlength of said bar; and a hand grip mounted on said bar and angularly adjustable with reference thereto.

8. A cutting mechanism comprising a blade carrier; a blade carried by said carrier; a pivotal connection between the carrier and the blade; a second blade mounted to cooperate with the first named blade; means for urging the blades into cooperative relationship to normally produce a shearing action, the pivotal connection permitting the first blade to swivel upon undue stress being placed upon the first blade; said first blade being movable under influence of said undue stress to a position permitting passage of the blade beyond the substance imposing the undue stress while concomitantly effecting a draw cut on the substance in the plane of engagement between the blades; and restorative means serving to establish a normal position of said first blade.

9. In a hedge trimmer, the combination of a supporting frame; an arcuate blade carrier offset from said frame, there being a journal between said frame and said blade carrier; a series of fixed blades mounted in spaced relation on said arcuate carrier; a rotary blade carrier mounted on said journal; at least one blade mounted on said rotary carrier and coacting with the said fixed blades; a guide located on the arcuate blade carrier adjacent the fixed blades and beneath said rotary carrier; and depending means carried by the rotary blade carrier to cooperate with the guide to maintain the relative positioning of the fixed and moving blades during cutting.

10. A cutting mechanism, comprising a blade carrier; a blade carried by said carrier; connecting means between said blade and said carrier permitting a yielding movement of said blade; a second blade mounted to cooperate with the first-named blade; means for urging the blades into cooperative relationship to normally produce a shearing action, said connecting means permitting the first blade to yield upon undue stress being placed upon the first blade, said first blade being movable under influence of said undue stress to a position permitting passage of the blade beyond the substance imposing the undue stress while concomitantly effecting a draw cut on the substance in the plane of engagement between the blades; and restorative means serving to establish a normal position of said first blade.

11. A cutting mechanism, comprising a blade carrier; a blade carried by said carrier; a pivotal connection between the carrier and the blade; a second blade mounted to cooperate with the first-named blade; means for urging the blades into cooperative relationship to normally produce a shearing action, the pivotal connection permitting the first blade to swivel to produce a drawing cut upon undue stress being placed upon the first blade, and the axis of said pivotal connection being substantially normal to the plane of engagement of the blades and substantially at midlength of the cutting edge of the first blade whereby it is substantially balanced against swiveling, and restorative means tending to establish a normal position of said first blade.

12. A cutting mechanism, comprising a supporting frame; a blade carrier connected to said frame; a series of fixed blades mounted in spaced relation on said blade carrier; a second blade carrier having movement in a fixed plane parallel with the plane of said fixed blades; at least

one blade carried by the moving blade carrier; connecting means between said blade and moving carrier permitting a yielding movement of said blade, said moving blade normally coacting with the fixed blades to produce a shearing action, and said connecting means permitting the blade to yield to a position substantially completely removed from its normal cutting swath upon undue stress being placed upon the moving blade and concomitantly produce a draw cut; and means serving to establish a normal position of said moving blade.

13. A cutting mechanism, comprising a rotatable blade carrier; a blade carried by said carrier; connecting means between the carrier and the blade permitting a yielding movement of the blade, said blade being positioned at a greater distance from the center of rotation of the carrier than the length of the blade; a second blade mounted to cooperate with the first-named blade; and means for rotating the carrier to bring the blades into cooperative relationship to normally produce a shearing action, said connecting means permitting the first blade to yield to produce a draw cut in the plane of engagement between the blades upon undue stress being placed upon the first blade.

14. A cutting mechanism, comprising a rotatable blade carrier; a blade carried by said carrier; a pivotal connection between the carrier and the blade, said pivotal connection being at a greater distance from the center of rotation of the carrier than the length of said blade; a second blade mounted to cooperate with the first-named blade; and means for rotating the carrier to bring the blades into cooperative relationship to normally produce a shearing action, the pivotal connection permitting the first blade to swivel to produce a draw cut in the plane of engagement between the blades upon undue stress being placed upon the first blade.

15. A cutting mechanism, comprising a supporting frame; a journal carried by said frame; a plurality of fixed blades mounted substantially radially with respect to the journal; a blade carrier mounted on said journal and rotatable in a fixed plane; at least one blade carried by the moving blade carrier; a pivotal connection between said moving blade and said carrier; means for rotating said carrier to bring the blades into cooperative relationship to normally produce a shearing action, the pivotal connection permitting the blade to yield to produce a draw cut upon undue stress being placed upon the blade; and means serving to establish a normal position of said blade on its carrier.

16. In a trimming device, a pair of coacting relatively movable blades arranged to produce a shearing cut; means for producing relative motion of said blades; resilient means for sustaining one of said blades against normal cutting resistance; and means associated with one of the blades and rendered effective by the overpowering of said resilient means when the resistance is abnormally high to induce movement of the substance being cut in the direction of the length of one of the coacting blade edges.

17. In a trimming device, a movable blade; a second blade mounted to cooperate therewith; means including a resilient element for causing said movable blade to cooperate with the second blade to effect a shear cut under normal cutting conditions; and means associated with the movable blade and rendered effective by yielding of the movable blade under excessive cutting resistance stressing said resilient element, for inducing movement of the substance being cut along the movable blade edge to produce a draw cut.

18. In a trimming device, a driving member; a blade driven by said member; a resilient element for yieldably and restoratively setting the blade in prescribed relationship with respect to said member; a second blade mounted to coact with the driven blade whereby under normal cutting conditions a shear cut will be effected; and means associated with the driving member and rendered effective by yielding of the movable blade under excessive cutting resistance for accomplishing movement of the substance being cut along the movable blade edge while subject to the stress of said resilient element to produce a draw cut.

19. In a hedge trimmer, the combination of a fixed carrier; a plurality of blades thereon and having their cutting edges lying in one plane; a blade carrier movable relatively to the fixed blade carrier; at least one blade mounted on said movable carrier and coacting with the fixed blades; a guide provided by the fixed blade carrier adjacent the fixed blades and disposed between the fixed carrier and the rotary carrier, said guide lying in a plane parallel with the plane of the blade edges; and depending means carried by the rotary blade carrier adjacent a blade thereon to cooperate with the guide to maintain the relative positioning of the fixed and moving blades during cutting.

20. In a hedge trimmer, a fixed blade assembly comprising a blade carrier, a plurality of spaced lugs depending from said blade carrier, and blades secured to said lugs and having their cutting edges lying in a common plane, said lugs providing clear spaces between each other for the free passage beneath the carrier of hedge ends cut at the level of the plane of said cutting edges, as the trimmer is advanced along the hedge.

21. In a hedge trimmer, a fixed blade assembly comprising a blade carrier, a plurality of blades carried thereby, and means separately connecting each of the blades with the carrier member so that the plane determined by the cutting edges of the blades is spaced apart from the carrier and hedge ends cut at the level of the plane of said cutting edges may pass freely beneath the carrier as the trimmer is advanced along the hedge.

22. In a hedge trimmer, a fixed blade assembly comprising a blade carrier, and a plurality of spaced blades attached to the under side of said carrier and having their cutting edges lying in a common plane, the spaces between said blades to receive the material to be cut being continued throughout the blade lengths and past the points of attachment of the blades to the carrier to provide clear spaces along the under side of the carrier for the free passage beneath the carrier of hedge ends cut at the level of the plane of said cutting edges as the trimmer is advanced along the hedge.

23. In a hedge trimmer, a blade movable in a single plane, means for driving said blade, a plurality of stationary blades, and means for supporting said stationary blades, the cutting edges only of said stationary blades lying in the plane of movement of the movable blade to cooperate with the movable blade, and the remaining portions of the stationary blades lying out of the path of movement of said movable blade so that gummy matter accumulated on the stationary blades is out of said plane and frictional resist-

ance thereby offered to the passage of the movable blade is minimized.

24. In a hedge trimmer, a plurality of fixed blades, means for supporting said blades in spaced relation with their cutting edges in a common plane, a movable blade for successively traversing and cooperating with said fixed blades, and means for driving said movable blade, said movable blade having at least one extended portion projecting from a point intermediate the length of its cutting edge and being of such length that the space between successive fixed blades is bridged and said movable blade will ride over the fixed blades.

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