

June 26, 1956

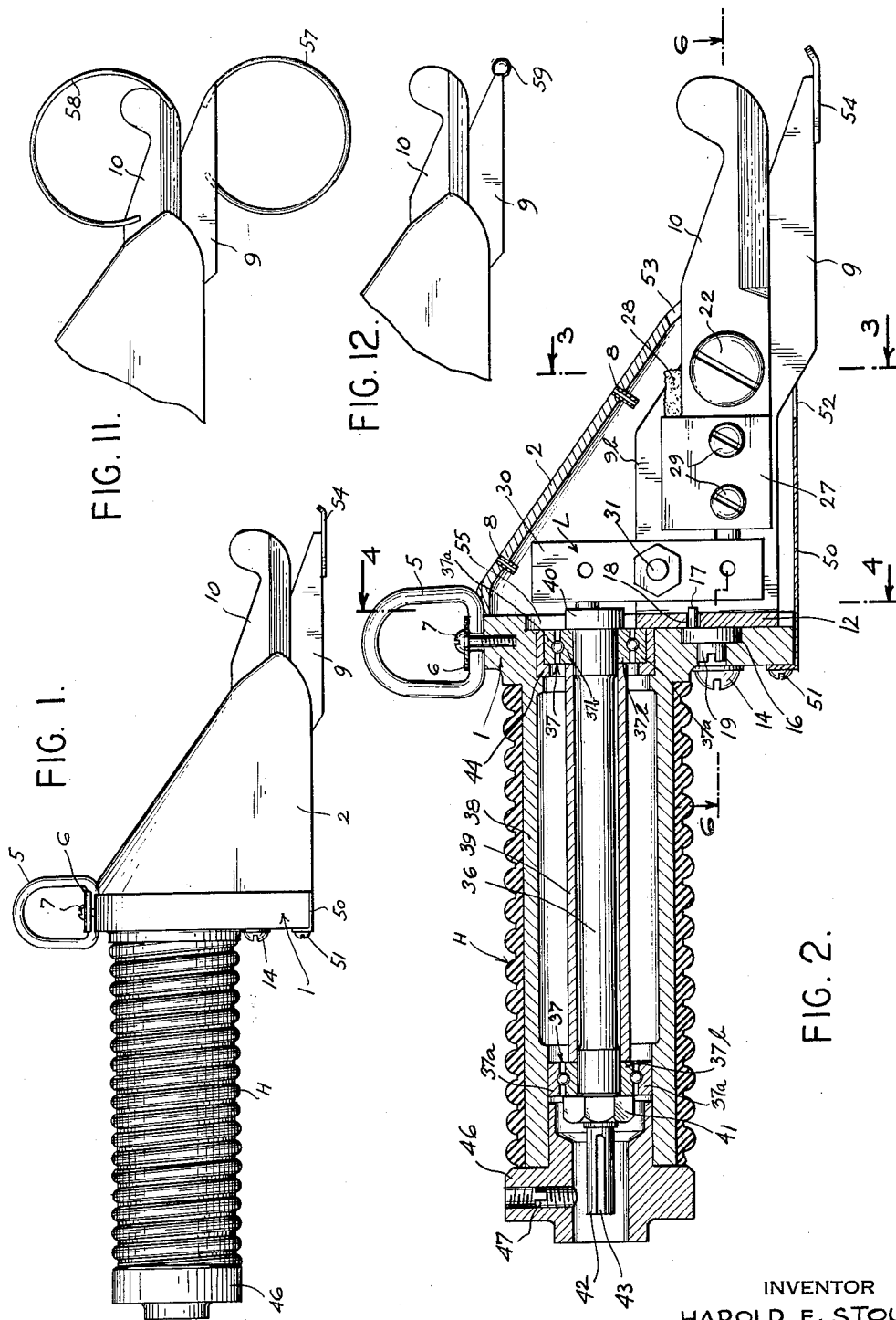
H. E. STOUT

2,751,682

POWER SHEAR

Filed March 1, 1954

4 Sheets-Sheet 1



INVENTOR
HAROLD E. STOUT
BY *Mock & Blum*
ATTORNEYS

June 26, 1956

H. E. STOUT

2,751,682

POWER SHEAR

Filed March 1, 1954

4 Sheets-Sheet 2

FIG. 3.

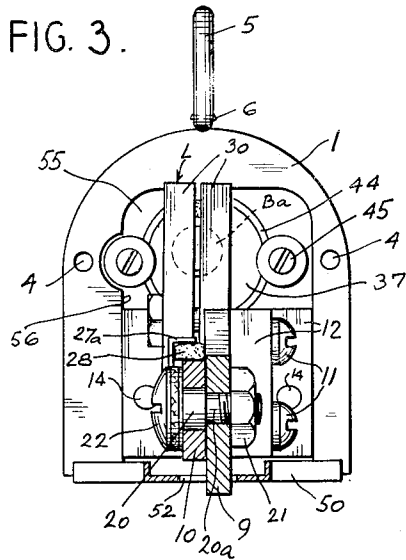


FIG. 4.

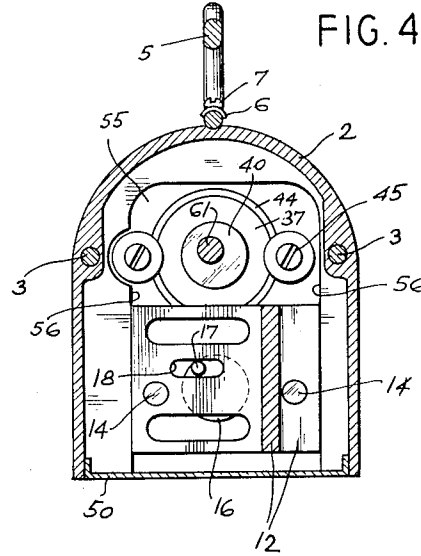


FIG. 5.

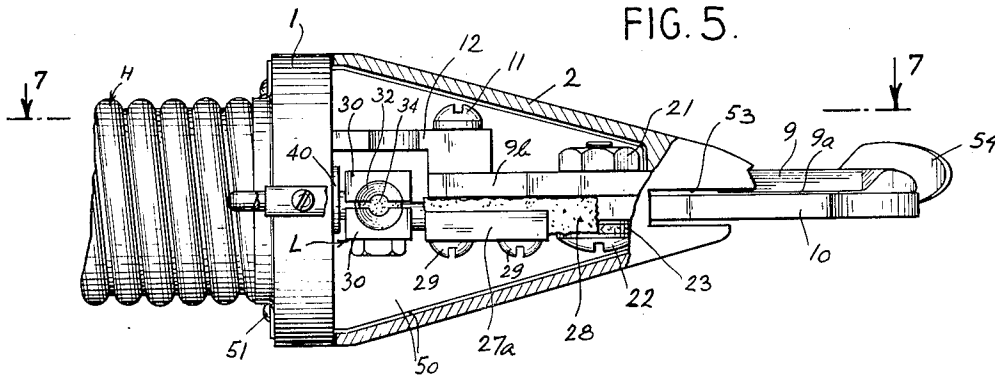


FIG. 6.

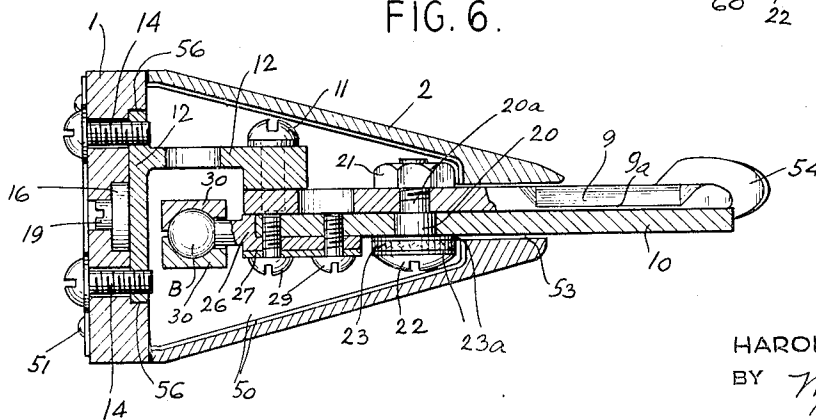
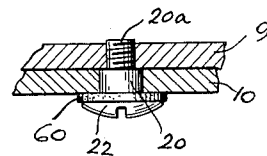


FIG. 13.



INVENTOR
HAROLD E. STOUT
BY *Mock & Blum*
ATTORNEYS

June 26, 1956

H. E. STOUT
POWER SHEAR

2,751,682

Filed March 1, 1954

4 Sheets-Sheet 3

FIG. 7.

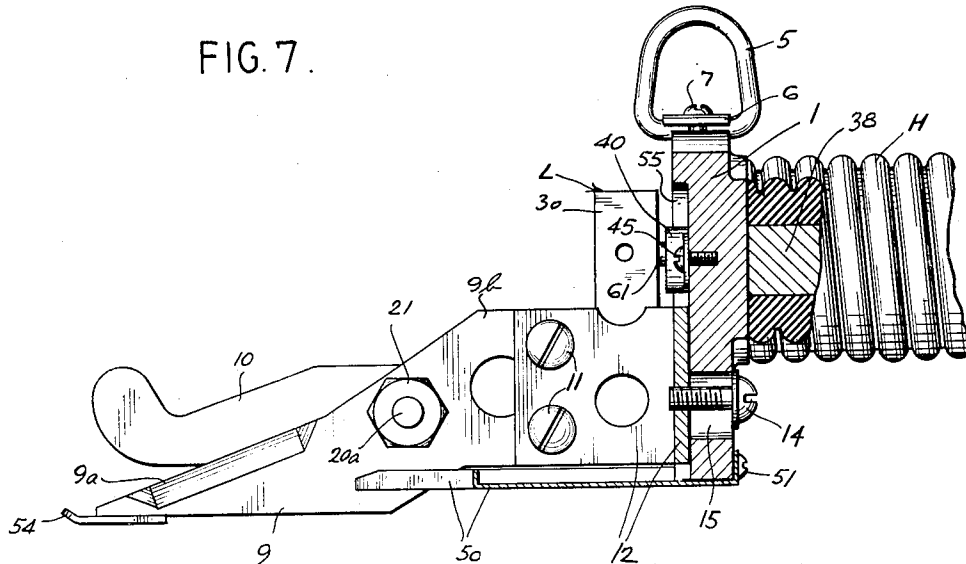


FIG. 8.

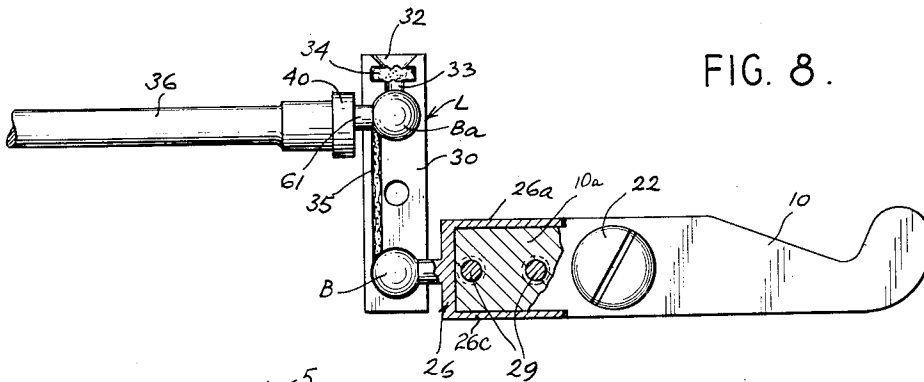


FIG. 10.

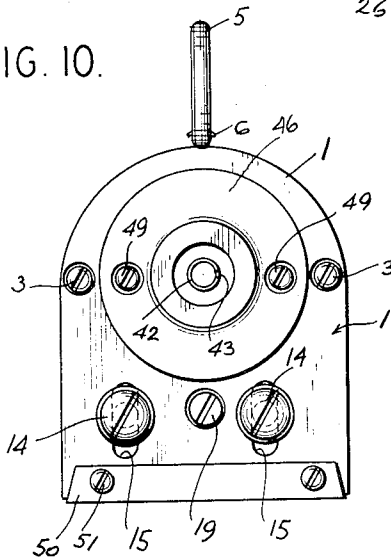
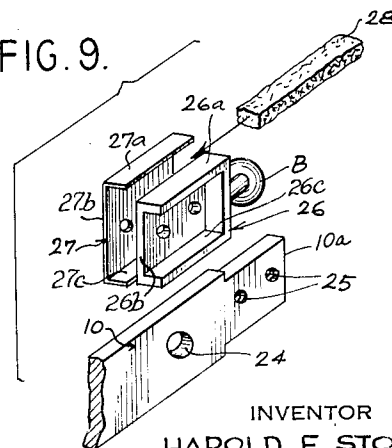


FIG. 9.



INVENTOR
HAROLD E. STOUT
BY *Mock & Blum*
ATTORNEYS

June 26, 1956

H. E. STOUT

2,751,682

POWER SHEAR

Filed March 1, 1954

4 Sheets-Sheet 4

FIG. 14.

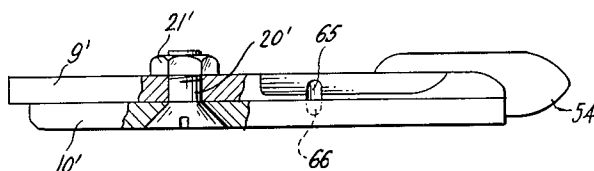


FIG. 15.

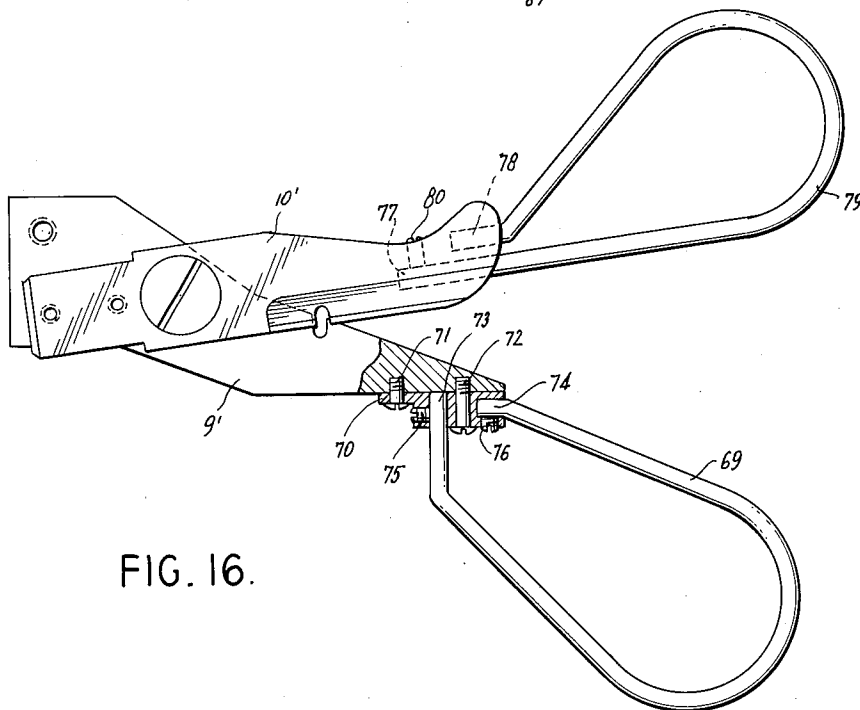
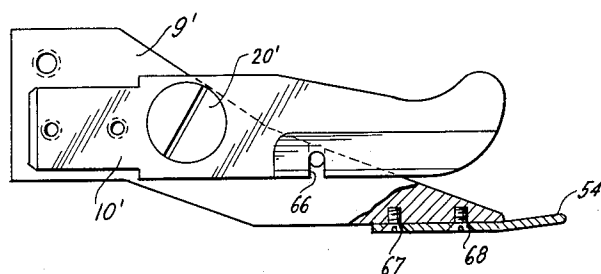


FIG. 16.

INVENTOR.
HAROLD E. STOUT
BY *Moore, Blum*
ATTORNEYS

1

2,751,682

POWER SHEAR

Harold Edgar Stout, West Leesport, Pa., assignor to
Textile Trimming & Boarding Machine Co., Inc.,
Reading, Pa., a corporation of Pennsylvania

Application March 1, 1954, Serial No. 413,047

8 Claims. (Cl. 30—233)

My invention relates to a new and improved power 15
shear.

One of the objects of my invention is to provide a power
shear which is especially adapted for cutting and shear-
ing fabric.

Other objects of my invention are to provide a simple 20
and effective device which can be manufactured and sold
at low cost.

Numerous additional objects and features and ad-
vantages of my invention are set forth in the annexed de-
scription and drawings, which illustrate preferred em-
bodiments of my invention.

Fig. 1 is a side view of an embodiment of my inven-
tion with the cover in position;

Fig. 2 is a vertical and longitudinal section of Fig. 1,
partially in elevation;

Fig. 3 is a section on the line 3—3 of Fig. 2, the cover
of the device being shown removed;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a top plan view of Fig. 1, partially in hori-
zontal section, a part of the representation of the cover 35
being omitted;

Fig. 6 is a sectional view on the line 6—6 of Fig. 2;

Fig. 7 is a sectional view on the line 7—7 of Fig. 5,
the representation of the cover being omitted;

Fig. 8 is a detail view of the driving mechanism for 40
oscillating the movable blade;

Fig. 9 is an exploded perspective view of certain of the
parts of the device;

Fig. 10 is a rear end elevation of Fig. 1;

Fig. 11 is a side elevation of a second embodiment of 45
the cutting blades;

Fig. 12 is a side elevation of a third embodiment of
the cutting blades;

Fig. 13 is a detail view, showing a modification of the
pivot between the cutting blades;

Fig. 14 is a top plan view, partly in section, showing 50
another embodiment of the cutting blades and the pivot
therebetween;

Fig. 15 is a side elevation of the embodiment shown
in Fig. 14; and

Fig. 16 is a side elevation showing still another em-
bodiment of the cutting blades constructed in accordance
with the present invention.

The drawings are substantially to scale.

The device comprises a casing 1 which has a removable
cover or hood 2. This cover or hood 2 has a lateral
arched shape.

As shown in Fig. 3, the plate or casing 1 has a similar
lateral arched shape. As shown in Fig. 3, the rear ver-
tical wall of the plate or casing 1 is provided with hori-
zontal and longitudinal holes 4. The walls of holes 4 are
of smooth cylindrical shape. Fig. 4 shows longitudinal
fastening screws 3 which have shanks which extend lon-
gitudinally through the smooth holes 4 into engagement
with tapped recesses which are provided at the rear
arched wall of the hood or cover 2, in order to releasably
fix cover 2 to casing 1. A holding ring 5 is turnably 70

2

connected to the top of casing 1 by means of a longi-
tudinal pivot sleeve 6, which is fixed to the casing 1 by
means of a screw 7. As shown in Fig. 2, the front lon-
gitudinal wall of hood 2 is provided with narrow bores 8
through which lubricating oil may be introduced into the
interior of the hood 2. The shear comprises a fixed
blade 9 and a turntable blade 10. As shown in Fig. 7,
the fixed blade 9 has an inclined cutting edge 9a and
a rear longitudinal shank 9b, which is fixed by means
of lateral screws 11 to bracket 12. As shown in Fig. 6,
the bracket 12 is of angular shape which is a substan-
tially L-shape. Said bracket 12 has a rear lateral wall
or flange to which longitudinal screws 14 are releasably
fixed. These screws 14 are clamping screws, which re-
leasably clamp bracket 12 to the vertical wall of casing
1. Brackets 12 and its clamping screws 14 are vertically
adjustable in unison so that the vertical relation of bracket
12 to the casing 1 can be adjusted. The rear lateral
flange of bracket 12 has vertical side-walls 56, which
fit slidably against the vertical walls of the front recess
55 of the plate or casing 1. As shown in Fig. 10, the
shanks of the clamping screws 14 fit closely in and are
vertically slidable in vertical enlarged slots 15 which are
provided in the rear vertical wall of the plate or casing
1. The clamping screws 14 can be loosened in order
to raise or lower bracket 12 without removing the cover
2 or said screws 14. The height of the bracket 12 can
then be manually adjusted, and the screws 14 can then be
tightened to clamping position. Special means are pro-
vided for a fine vertical adjustment of the bracket 12
relative to the casing 1 when the clamping screws 14
are loosened. As shown in Fig. 2, these special adjust-
ing means comprise a disc 16 which is turnably mounted
in a recess of the vertical wall of casing 1, so that the
disc 16 can be turned about a horizontal longitudinal
axis. This disc 16 has an eccentric pin 17 which, as
shown in Fig. 4, fits and is located in a horizontal and
horizontally enlarged slot 18 of the lateral rear wall of
the bracket 12. This disc 16 has a rear longitudinal pro-
jection 19 which is provided with a groove or recess, by
means of which the disc 16 can be manually turned by
a screw-driver. The bracket 12 and its fixed blade 9
can therefore be precisely vertically adjusted while clamp-
ing screws 14 are loose, in order to allow for wear of
the blades and also to cut different thicknesses of the
cloth or other material. This can be done while the
fixed blade 9 is connected to or disconnected from turn-
table blade 10. As shown in Fig. 6, the turntable blade
10 is pivotally connected to the fixed blade 9, by means
of a pivot 20, which has a smooth cylindrical surface
which extends through a smooth bore 24 of blade 10.
This pivot pin 20 has a threaded extension 20a, which
extends through a bore of the fixed blade 9. A resilient
and compressible washer 23, which is made of an oil-
resistant synthetic rubber or other suitable material, is
located between the head 22 of pivot pin 20 and the turn-
table blade 10. An assembly nut 21 is screwed upon the
threaded extension 20a. The resilience of washer or disc
23 makes it possible to maintain the adjacent lateral
faces of the blades in tight sliding contact. In order to
minimize wear upon the resilient washer 23, it is located
between two metal washers 23a which respectively abut
the head 22 and the turntable blade 10.

As shown in Fig. 9, the turntable blade 10 has a rear ex-
tension 10a of reduced height, which is provided with
lateral holes 25. This extension 10a provides vertical
shoulders at the rear end of blade 10. As shown in Fig.
9, a box or box member 26 is provided. This box 26
has one end-wall, which is fixed to a ball B by means of
an intermediate cylindrical shank. This box 26 has
four walls, namely, a base-wall 26b, side walls 26a and
26c, and a single end-wall. A U-shaped cover member

27 is associated with box 26. This cover 27 has a base wall 27b and side walls 27a and 27c.

As shown in Fig. 8, the side walls 26a and 26c are longitudinally directed and they abut the longitudinal walls of the reduced extension 10a of the turnable blade 10. The single end wall of box 26 then abuts the end wall of said extension 10a and the edges of side walls 26a and 26c are then at the shoulders which are provided by the reduced extension 10a. In said assembly, the base-wall 26b abuts the respective face of the reduced extension 10a.

In the assembly, the side wall 27c of cover 27 abuts the side wall 26c of box 26, and side wall 27a of cover 27 is spaced above the side wall 26a of box 26. A longitudinal absorbent strip 28 is held between the spaced side walls 27a and 26a. The base wall 27b abuts the respective face of reduced extension 10a. The absorbent strip 28 overlies a part of the top wall of blade 10, in front of the reduced extension 10a, so that strip 28 is in position to receive lubricant from the respective adjacent opening 3 of cover 2, so that the absorbent strip 28 is kept saturated with lubricant. The base wall or vertical wall 27b of cover 27, and the base wall or vertical wall 26b of box 26, are clamped to the extension 10 by means of lateral screws, 29, whose threads engage the internal threads of tapped bores which are provided in said walls 27b, 26b and the tapped bores 25 of extension 10a. One longitudinal face of the lubricating strip 28 abuts the face of fixed blade 9 which is adjacent the turnable blade 10, so that a film of lubricant is supplied to said face of fixed blade 9 and to the adjacent face of the turnable blade 10, so that the longitudinal abutting or closely adjacent faces of the blades 9 and 10 are effectively lubricated.

The link L consists of two identical channels 30, whose adjacent vertical edges may be spaced from each other. The adjacent vertical base walls of said channels 30 are provided with recesses which have the shapes of parts of spheres, to provide a turnable assembly between link L and said ball B and another ball Ba. These balls B and Ba interfit with said recesses in the assembly. The channels 30 are held to each other by a fastening member 31, which is shown in Fig. 2. This member 31 is located between the balls B and Ba. The member 31 holds the channels 30 assembled with the balls B and Ba, which can turn freely relative to link L in the respective ball-and-socket joints.

As shown in Fig. 8, each channel or link-member 30 is recessed at its top, in order to provide link L with a top funnel-shaped opening 32, through which lubricant can be introduced. As also shown in Fig. 8, the spaced channels 30 are shaped to interfit with and to hold an absorbent pad 34, which is kept saturated with lubricant. This lubricant can flow or drip from pad 34 to the ball Ba through the space 33 which is provided in link L below pad 34, so that the upper ball Ba is effectively lubricated. The base walls of the channels 30 are also recessed to interfit with and to hold a vertical absorbent strip 35 which abuts the balls Ba and B. This strip 35 receives lubricant from upper ball Ba and it transmits said lubricant to the lower ball B. The adjacent longitudinal edges of channels 30 may be laterally spaced from each other, as shown for example in Fig. 5, or said edges may abut each other in the assembly. These channels 30 may have planar adjacent vertical faces at balls B and Ba, save where part-spherical recesses are provided to interfit with balls B and Ba, or said adjacent vertical faces of channels 30 at balls B and Ba may have the shapes of parts of cylinders, save where said part-spherical recesses are provided. The upper ball Ba is rigid with a longitudinal rigid pin 61 which is fixed to the head 40 of longitudinal shaft 36. As shown in Fig. 8, the center of the ball Ba and the axis of pin 61 are eccentric relative to the longitudinal axis of rotation of the shaft 36, so that the rotation of the shaft 36 moves link

L up and down in order to oscillate the turnable blade 10 around its pivot 20. This shaft 36 is provided with conventional anti-friction ball bearings 37. These anti-friction ball bearings 37 comprise outer fixed races 37a, which are fixed to the longitudinal sleeve 38, which is integral with the casing 1. Said anti-friction ball bearings 37 also comprise the usual inner races 37b which are fixed to the shaft 36. The shaft 36 is located within a spacer sleeve 39 which is clamped to the races 37b, so that the sleeve 39 rotates in unison with the shaft 36 and races 37b.

Conventional front and rear anti-friction bearings 37 are shown in Fig. 2. In this embodiment, said anti-friction bearings are ball-bearings. Each bearing 37 has respective races 37a and 37b. The races of each bearing are pre-assembled in the usual manner, so that each bearing 37 is a pre-assembled element of the device, in which the respective races 37a and 37b are held assembled with each other.

The longitudinal and cylindrical shaft 36 has cylindrical enlargements at its front and rear ends, and it also has an enlarged cylindrical head 40 at its front end. Said head 40 is located in the front recess 55 of casing 1.

The front race 37a has an outer longitudinal cylindrical face which abuts the inner cylindrical face of the longitudinal flange of angular sleeve 44. This sleeve 44 may be removable from casing 1 or it may be fixed permanently to casing 1. The rear edge of front race 37a is annular and planar and it abuts the annular planar face of the annular transverse flange of sleeve 44. The front edge of front race 37b is planar and it abuts the rear planar face of head 40. The inner longitudinal cylindrical face of front race 37b abuts the cylindrical face of the front enlargement of shaft 36.

The outer longitudinal cylindrical face of rear race 37a abuts the cylindrical face of a reduced part of sleeve 38. The inner cylindrical longitudinal face of rear race 37b abuts the rear enlargement of shaft 36. The rigid cylindrical spacer sleeve 39 abuts the front and rear enlargements of shaft 36. Said spacer sleeve 39 also abuts the front and rear races 37b.

Shaft 36 has a reduced rear extension which has a forked end 42, which has a transverse slot 43 for engagement with the usual flexible driving shaft which is coupled to driven shaft 36. Said reduced rear extension of shaft 36 has a thread which is engaged by clamping nut 41, which clamps the front and rear races 37b to spacer sleeve 39.

The shaft 36 and spacer sleeve 39 and the front and rear races 37 can thus be clamped to each other externally of casing 1 and its sleeve 38, as a pre-assembled sub-unit, which may include link L and the turnable blade 10.

The sleeve 44 can also be assembled with this sub-unit.

This pre-assembled sub-unit can be slid rearwardly into position, and the turnable blade 10 can then be pivotally connected to blade 9, and hood 2 can then be fixed to casing 1. The entire sub-unit can also be removed in an assembled form. Any conventional additional releasable means can be used, if desired, to prevent spacer sleeve 39 from shifting longitudinally relative to casing-sleeve 38.

As shown in Fig. 4, the heads of screws 45 extend over and abut the front face of the longitudinal flange of the angular sleeve or ring 44, and said heads or screws 45 also extend over and abut the front faces of the front races 37a. These heads of screws 45 thus prevent the ring 44 and the sub-unit from shifting forwardly. The shanks of screws 45 engage the internal threads of longitudinal bores or recesses of casing 1.

Also, the flexible driving shaft, not shown, has the usual outer sleeve which fits in insert 46, which is releasably fixed to casing-sleeve 38. This flexible driving shaft has a driving key which fits tightly in slot 43. The flexible driving shaft is turnable in its outer sleeve, which is clamped in position by clamping screws 47. Also, the

rear bearing 37a may abut the front edge of insert 46. The races 37a, which may be designated as the sleeve-races, are thus held against turning or longitudinally shifting relative to casing-sleeve 38, and the races 37b, which may be designed as shaft-races, turn freely in unison with shaft 36.

The casing sleeve 38 is provided with a ribbed handhold H, which is held in position between insert 36 and the casing 1.

The insert 46 is releasably fixed to casing-sleeve 38 by longitudinal screws 49 which are shown in Fig. 10. A drip pan 50 for holding surplus lubricant has a vertical flange which is fixed to the casing 1 by means of screws 51. This drip pan 50 has vertical flanges which make a snug fit with the hood 2. As shown in Fig. 2, this drip pan has a slot or recess 52, through which the front part of fixed blade 9 extends. The cover 2 has a front longitudinal and vertical slot 53, to permit the oscillating movement of the turnable blade 10. A guide shoe 54 is fixed to the bottom of the front of the fixed blade 9. Various additional holes or cut-outs are shown in the parts, in order to make them lighter.

As previously noted, front vertical recess 55 of casing 1 has parallel and vertical guide walls 56, as shown in Fig. 4, with which the vertical walls of the lateral arm of bracket 12 make accurate sliding contact, in order to guide the vertical adjusting movement of the bracket 12.

Fig. 11 shows a modification, in which the fixed blade 9 is provided with a bottom loop or ring 57, and the movable blade 10 is provided with a corresponding top loop or ring 58. These metal loops 57 and 58, which may be rigid or resilient, are of sufficient size so that the shearing device can be used for cutting netted fabrics or other fabrics which have large meshes or loops, in order to prevent the blades from catching in said meshes or loops.

In the modification of Fig. 12, the shoe 54 of Fig. 2 is replaced by a ball 59.

In the modification of Fig. 13, the resilient washer 23 and the metal washers 23a are replaced by a single washer 60 which may be made of nylon or other resilient and wear-resistant material. Also in this embodiment, the assembly nut 21 is omitted and the threaded shank 20a of pivot 20 is screwed into a tapped hole of the fixed blade 9.

Another embodiment of the present invention is illustrated in Fig. 14, wherein the fixed and movable blades are designated 9' and 10' respectively. The pivotal connection 20' eliminates the resilient washer described hereinabove, and comprises a flathead screw having its head seated in a countersunk opening formed in the turnable blade 10' and its threaded shank extending through and beyond the fixed blade 9' for engagement with a nut 21'. An important feature of this modification is the provision of cutouts or notches 65 and 66 which are respectively ground or otherwise formed in the cutting edges of the blades 9' and 10'. The notches 65 and 66 are arranged to partially register with each other when the blades 9' and 10' are in closed position, as at the end of a cutting stroke, as shown in Fig. 15; and, the disposition of the notches 65 and 66 along the blade cutting edges is just beyond the open blade portions at the beginning of a cutting stroke so that actual severance of the material will not be adversely affected. This notch arrangement and construction has been found highly satisfactory for preventing the movement of fuzz or loose fibers, such as from woolen blankets or the like, into the region of pivot 20' during the cutting operation.

It will also be noted, see Fig. 15, that foot 54 may be detachably secured to the fixed blade 9', as by threaded fasteners 67 and 68. By this construction, the flat foot 54 may be quickly and easily interchangeable with the ball foot 59, or wire loop 57, without removal of the blade 9'.

In Fig. 16 is shown another form of the present inven-

tion which is particularly well adapted to accommodate, interchangeably a variety of blade attachments. The fixed blade 9' is provided on its working end with a loop 69 detachably connected to the blade by the bracket 70. More particularly, the bracket 70 is rigidly, but removably secured to the blade 9' by the threaded fasteners 71 and 72, and is provided with openings for receiving the opposite ends 73 and 74 of the loop 69. The loop ends 73 and 74 are detachably secured to the bracket 70 by set screws 75 and 76. Thus, the loop 69 may be removed from the bracket 70 and replaced by a different loop or other attachment, as desired, or both the bracket and loop may be removed to permit attachment of the foot 54 or other desired member.

The blade 10' has its working end shaped to receive the opposite ends 77 and 78 of the loop 79, and a set screw 80 is provided to detachably secure the loop 79 to the blade 10'.

It will be noted that the blades of the instant device are pivotally connected together without shear therebetween. That is, the blades of the present invention are set so that their cutting edges will not bearingly engage with each other upon pivotal movement thereof, in contradistinction to similar devices, such as hand scissors and hand shears. This absence of bearing pressure between the blade edges has proved to substantially elongate the permissible period of use between sharpenings, and permit operation at extremely high blade speeds, up to 3450 cycles per minute.

Whenever I refer to the casing 1, I include any suitable support to which the blades 9 or 9' may be adjustably or non-adjustably fixed.

For convenience, the blades 9 and 9' are each designated as the first blade, and the blades 10 and 10' are each designated as the second blade.

For convenience, the device has been described with reference to the vertical position of the casing or support 1, which is shown in Fig. 2. Of course, the device may be used at any angle. For convenience, the vertical direction is described as the transverse direction in the claims.

There has been described a preferred embodiment of the invention, but it is obvious that various changes and omissions and additions may be made without departing from its spirit and scope.

I claim:

1. A shearing device which comprises a first longitudinal blade, a second longitudinal blade pivotally connected to said first blade, a support, a bracket which has a lateral flange, means fixing said first blade to said bracket, said lateral flange being transversely adjustable relative to said support, means fixing said lateral flange in adjusted transverse position to said support, an operating shaft turnably connected to said support, and link-means connecting said operating shaft to said second blade, said link-means being adapted and operative to oscillate said second blade around its pivot when said shaft is rotated.

2. A shearing device according to claim 1, in which said bracket has a longitudinal flange to which said first blade is fixed.

3. A shearing device comprising a support, a first blade carried by the support and projecting therefrom, a second blade disposed in side by side relation with the first blade and pivotally connected thereto for oscillatory movement relative thereto, a bracket member, means fixing the first blade to the bracket member, fastening means securing the bracket member to the support for adjustment of the bracket member in a rectilinear path paralleling the plane in which the first blade lies, means for moving said bracket member to selected positions of adjustment in which the bracket member is secured by the fastening means, a rotary operating means carried by the support and means connecting the rotary operating means to the second blade.

7

4. A shearing device as claimed in claim 3, wherein said support includes a flat plate forming a rear wall of a housing which has a removable hood that encloses the bracket member and the connecting means and the pivot connection between the blades.

5. A shearing device as claimed in claim 4 wherein said plate has a tubular extension outstanding therefrom in the opposite direction from the blades and said rotary operating means includes a rotary shaft journaled in the extension and extending through the plate for attachment to the connecting means, said tubular extension being externally surfaced to provide a hand hold for the device.

6. A shearing device as claimed in claim 4 wherein said fastening means and means for moving the bracket member are accessible externally of the housing.

7. A shearing device as claimed in claim 3, wherein said fastening means includes screws and said support having elongated slots in which the screws, when released, are slidable.

8

8. A shearing device as claimed in claim 3, wherein said means for moving the bracket member includes a disc rotatable in the support and an eccentric pin extending from the disc and fitted in the bracket member and means for rotating the disc.

References Cited in the file of this patent

UNITED STATES PATENTS

10	D. 1,47,416	O'Brien -----	Sept. 2, 1947
	1,890,355	Bailey -----	Dec. 6, 1932
	2,226,241	Gray -----	Dec. 24, 1940
	2,273,376	Reynolds -----	Feb. 17, 1942
	2,348,876	Beard -----	May 16, 1944
15	2,621,404	Koons -----	Dec. 16, 1952
	2,635,335	James -----	Apr. 21, 1953

FOREIGN PATENTS

270,135	Great Britain -----	May 5, 1927
---------	---------------------	-------------