M. O. REHFUSS.

SHEARING MACHINE.

APPLICATION FILED DEC. 5, 1917.

1,380,249.

Patented May 31, 1921.

2 SHEETS—SHEET 1.

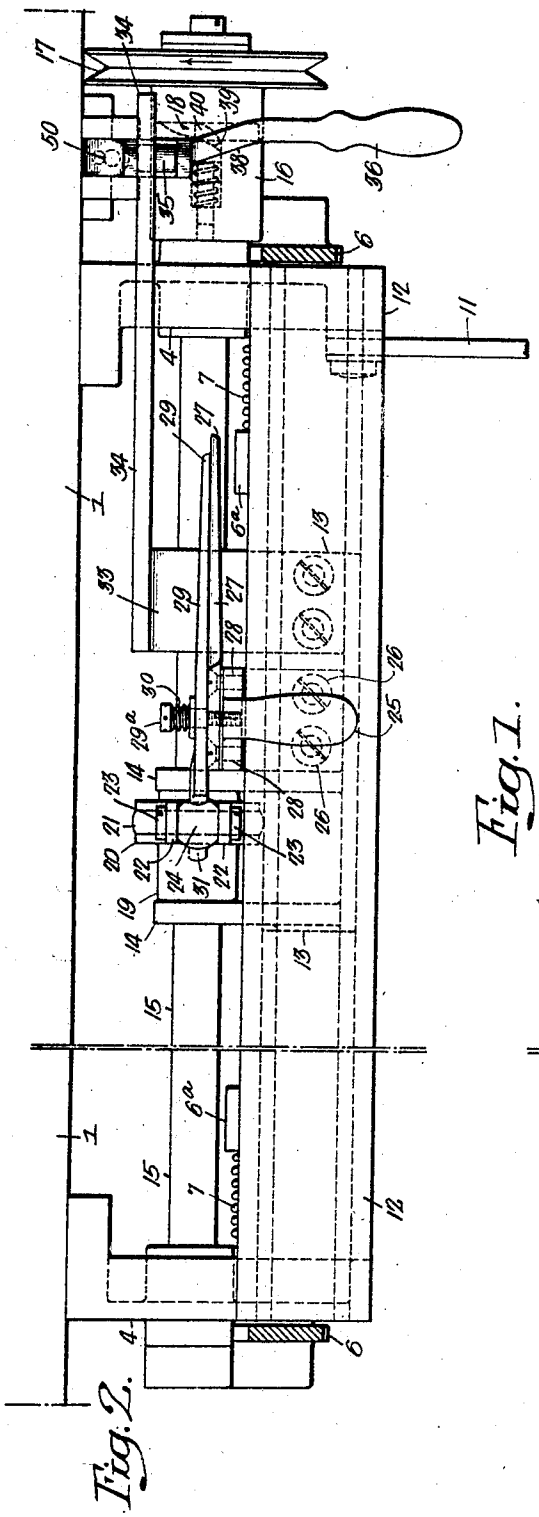


Fig. 2.

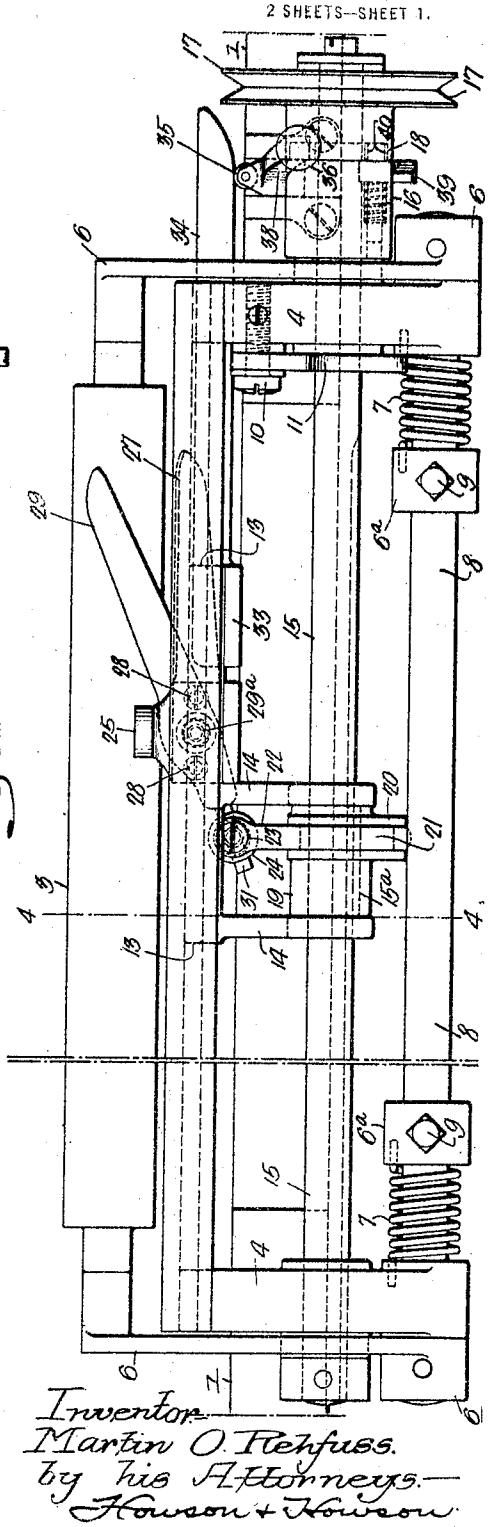


Fig. 1.

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Martin O. Rehfuss.
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2 SHEETS—SHEET 2.

Fig. 4.

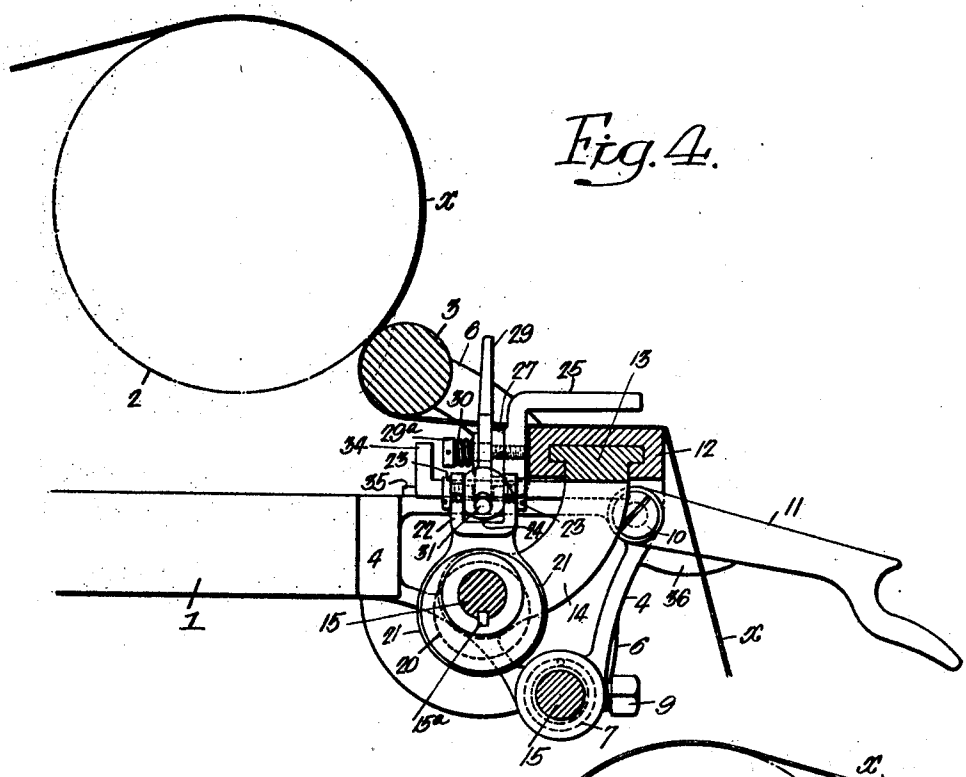
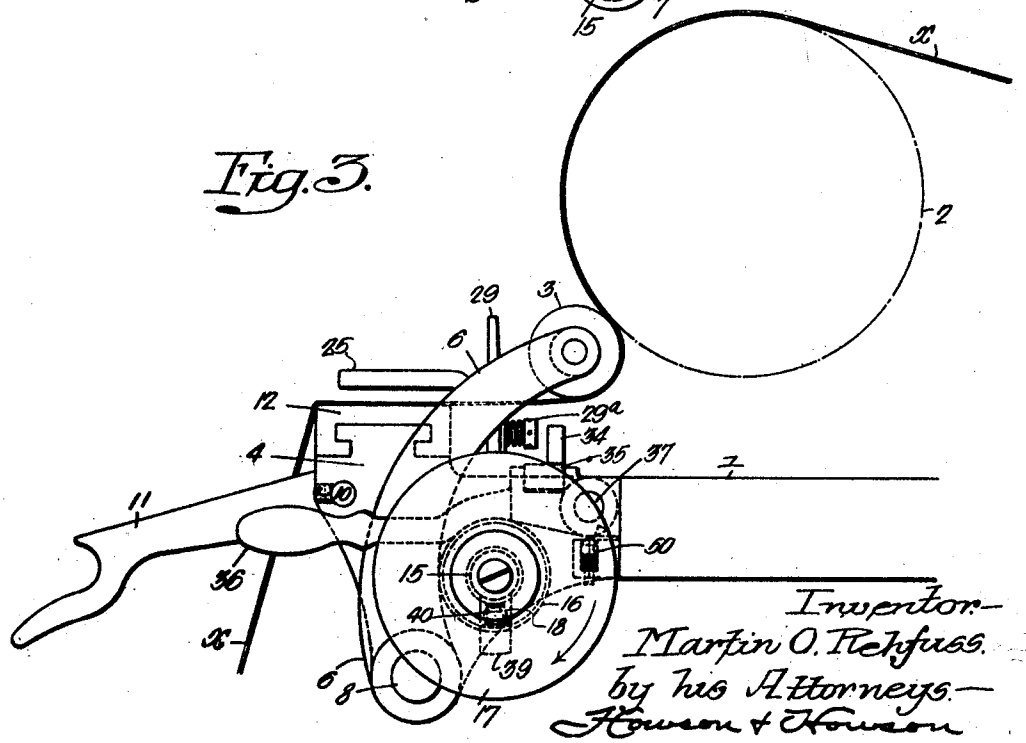



Fig. 3.




Inventor.—
Martin O. Rehfuss.
by his Attorneys.—
Howson & Howson

# UNITED STATES PATENT OFFICE.

MARTIN O. REHFUSS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JOHN WANAMAKER, PHILADELPHIA, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## SHEARING-MACHINE.

1,380,249. Specification of Letters Patent. **Patented May 31, 1921.**

Application filed December 5, 1917. Serial No. 205,517.

*To all whom it may concern:*

Be it known that I, MARTIN O. REHFUSS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented a Shearing-Machine, of which the following is a specification.

One object of my invention is to provide a relatively simple and substantial device for quickly and accurately cutting lengths of sheet material such as dress goods fabric or the like from rolls or pieces of the same;—the invention contemplating more particularly novel means for movably supporting and actuating a pair of shears while this is being moved transversely of the material to be cut.

I further desire to provide a novel device for automatically stopping the operation of the shears forming part of a cutting mechanism of the above type, when they have been brought to a predetermined point;—it being also desired to provide a novel mechanism for actuating the movable element of a pair of shears from a source of power, which shall be so constituted as to permit of bodily movement of said shears transversely of the piece of material to be cut.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which,

Figure 1 is a side elevation of the shearing mechanism constituting my invention, showing it as applied to a measuring machine;

Fig. 2 is a plan, partly in section, further illustrating the device of Fig. 1;

Fig. 3 is an elevation of the right hand end of the mechanism shown in Fig. 1; and

Fig. 4 is a transverse vertical section on the line 4—4, Fig. 1.

For purposes of illustration I have shown my invention as mounted to coöperate with the measuring machine described and claimed in a patent to Messrs. Tily, Rehfuss and Rehfuss, #1.293,987, dated February 11, 1919, although obviously it may be employed independently thereof without material alteration.

In the above drawings, 1 represents the table, 2 the measuring roll and 3 the pressure roll of the measuring machine, which also includes a pair of projecting arms or brackets 4 at opposite ends of the table 1 between whose outer portions extends a horizontal shaft 5. The ends of this latter project respectively beyond the brackets 4 which constitute bearings and have fixed to them arms 6 in whose outer ends is journaled the spindle of the pressure roll 3. The latter at all times tends to swing toward the measuring roll 2 under the action of a pair of springs 7 on the shaft 8, and each of these springs has one end fixed to the bracket 4 and the other end fixed to a collar $6^a$, the collars being held to said shaft by set screws 9 in such adjusted positions that the springs act as above noted.

Pivoted to the right hand bracket 4 by means of a screw 10 is a holding arm 11, forked or recessed at its outer end so as to engage one end of the spindle of the roller 3;—the arrangement being such that when the latter is swung away from the measuring roll through a predetermined angle, its spindle will enter the fork of said arm which will thereafter prevent it from moving toward the roll 2 under the action of the springs 7, although it may be freed from the arm by suitable movement away from said roll.

The upper and outer portions of the two brackets 4 are rigidly connected by a flat topped bar 12 over which fabric $x$ is guided to the roll 3 and thence over the measuring roll 2. This bar has its under face recessed to provide a guideway in which is slidably mounted a carriage 13, which among other things is characterized by having a pair of downwardly and rearwardly projecting arms 14, parallel but spaced apart and each provided with an opening for the passage of an operating shaft 15 whose ends are rotatably mounted in suitable bearings in the brackets 4.

One end of said shaft projects beyond its bearing bracket and has fixed to it a hub or collar 16 beyond which it loosely carries a constantly driven pulley wheel 17, whose hub adjacent the collar 16 has at least one projecting tooth 18. The shaft 15 is formed

with a longitudinal keyway for the greater part of its length designed for the reception of a spline $15^a$ serving to operatively connect to the shaft a collar 19 mounted upon it between the two arms 14 of the carriage 13.

Formed integral with it or otherwise suitably attached to the collar 19 is an eccentric 20 having a strap 21 formed with an upwardly projecting fork 22 in whose branches is mounted a pair of tunnion screws 23 which serve to hold between said branches a ball-like member 24 having through it a passage of larger diameter than the ends of said screws. As a result said member 24 is free to rotate as well as slide bodily to a limited extent in any direction in the plane of the driving shaft 15, between the branches of the strap 22.

For bodily sliding the carriage 13 in its guideway and also sliding the collar 19 with the eccentric longitudinally of the shaft 15, I provide a handle 25 projecting horizontally above the bar 12 and having a portion extended vertically downward past the rear edge of said bar and then under the same, where it is rigidly fastened to the body of the carriage by a pair of screws 26. The vertical portion of said handle structure at the rear side of the bar 12 has rigidly connected to it the fixed blade 27 of a pair of shears or scissors held in place by screws 28 (Fig. 2). The second and movable blade 29 of the shears is pivoted to the fixed blade by a screw $29^a$ between whose head and said movable blade is a spring 30 serving to press the latter into yielding engagement with the fixed blade.

The lower end 31 of the movable shear blade 29 is preferably given a rod-like or cylindrical form and projects loosely through an opening or passage in the ball member 24 which extends at right angles to the line of the trunnion screws 23. The arrangement is such therefore that said ball member constitutes a universal joint connection between the movable shear blade 29 and the fork of the eccentric strap 22, permitting the parts to properly perform their functions under operating conditions without an objectionable amount of friction or tendency to abnormal wear.

Also fixed to the carriage 13 is a rearwardly extending plate 33 from which a cam arm 34 projects parallel to the line of movement of said carriage to a point considerably in advance of the shear blades 27—29 so that when the advancing ends of these have reached a point adjacent the right hand bracket 4, the forward end of said cam arm will come into engagement with a roller 35 mounted on the upper edge of a hand lever 36 whereby the machine may be started and stopped at will.

For this purpose said lever is pivoted by a spindle 37 to a portion of the table or frame 1 (Fig. 2) and is bent or provided with a cam surface 38 designed to be engaged by the projecting lug 39 of a tooth 40 longitudinally movable in a line parallel to the spindle 15 within a suitable cavity in the collar or sleeve 16. This tooth is at all times forced toward the toothed face of the hub of the driving pulley 17, but when the lever 36 is in its lower position, it is held away from said hub so that said pulley is free to turn on the shaft 15 without rotating it.

If, however, said lever 36 is raised, the lug 39 is released and is thereupon free to move out of engagement with the tooth 37 of the pulley wheel with the result that the collar 16 and hence the shaft 15 is turned. A spring catch 50 is provided on the table or frame 1 in position to enter suitable recesses in the lever 36 so as to hold this either in its raised or in its lowered positions.

With the above described arrangement of parts the fabric $x$ to be measured by the machine of which in the present case the roller 2 forms a part, passes between the top of the bar 12 and the pressure roll 3 and in so doing crosses approximately at right angles the plane of movement of the shear blades. While said fabric is being drawn through the machine and measured, the carriage 13 with its attached parts occupies a position at the extreme left hand end of its guideway in the bar 12 and thereafter when it is desired to cut said fabric from the piece or roll thereof, the lever 36 is raised, releasing the lug 39 and coupling the constantly driven pulley 17 to the splined shaft 15. Said lever is thereafter held in its raised position by the catch 50.

Said shaft is thus turned and through the key $15^a$ likewise rotates the sleeve 19 and the eccentric 20, thereby reciprocating the strap 22 and rapidly oscillating the movable shear blade 29 on its pivot. The operator, after grasping the handle 25, slides the carriage 13 with the shears, etc., from the left to the right side of the machine and since during this movement, the shear blade 29 continues to oscillate, the fabric extending between the bar 12 and the roller 3 is cut, it being understood that the cutting edge of the fixed shear blade 27 lies slightly below and substantially parallel with said fabric.

As the carriage approaches the right hand side of the machine, the curved extremity of its projecting cam arm 34 strikes the roller 35 of the lever 36, forcing this from its raised position in which it has been held by the spring catch 50 (Fig. 3) to its lower position in which within one revolution of the shaft 15, the lug 39 will strike the cam surface 38 and with the tooth 40 be moved laterally so as to withdraw the latter from engagement with the tooth of the hub of the driving wheel 17. The shears are thus put

out of operation and may now be again returned to the left hand end of the machine prior to making another cut.

With the above described arrangement and construction of parts, the cutting mechanism is in operation only when it is desired for use and is of such a nature as to require a minimum of attention and repair;—it being understood that the pulley wheel is turned at such a speed as to oscillate the movable shear blade with sufficient rapidity to cause it to properly cut the sheet material regardless of the speed at which the carriage is moved across the machine.

I claim:—

1. The combination in a shearing machine of means for supporting a body of sheet material in a plane; a guide; a pair of scissors bodily movable on said guide and including a fixed blade operative immediately adjacent the plane in which the material is supported; and means for continuously oscillating the second blade of said scissors while the latter is moving in one direction on the guide, consisting of a rotary shaft, and mechanism operatively connecting said shaft with the second scissors blade.

2. The combination in a shearing machine of two structures for supporting a body of sheet material in a definite plane of which one structure includes a guide extending transversely of the sheet material; a carriage directed in a straight line by the guide; a cutter mounted on the carriage with its edge adjacent the plane in which the sheet of material is supported; a second cutter pivoted on the carriage; and means for continuously oscillating said latter cutter to cause it to coact with the first cutter while the carriage is moving on the guide, consisting of a rotary member and an element traveling upon said member for transmitting power therefrom to the second cutter.

3. The combination in a shearing machine of a guide; a pair of scissors bodily movable on said guide; means for operating said scissors while they are moving on the guide; with a device for rendering said scissors inoperative when they reach a predetermined point in their path of movement.

4. The combination in a shearing machine of means for supporting a body of sheet material; a guide extending transversely of the sheet material on said supporting means; a carriage operative on the guide; a cutter pivoted on the carriage; means for oscillating said cutter while the carriage is moving on the guide; with a device for automatically causing stoppage of said oscillating means when the carriage reaches a predetermined point on the guide.

5. The combination in a shearing machine of a guide; a pair of scissors bodily movable on said guide; means for operating said scissors while they are moving on the guide; a clutch through which power is transmitted to said operating means; and means movable with the scissors for releasing said clutch when the said scissors have been moved to a predetermined position.

6. The combination in a shearing machine of a shaft; a carriage movable in a line substantially parallel thereto; a pair of scissors on the carriage; and means operatively connecting the shaft and the movable element of said scissors for actuating the latter while the carriage is being moved.

7. The combination in a shearing machine of a shaft; a carriage movable substantially parallel thereto; a pair of scissors mounted on the carriage; an eccentric splined to the shaft; with means operatively connecting the eccentric and the movable element of the scissors for oscillating the same while the carriage is being moved.

8. The combination in a shearing machine of a guide; a carriage movable thereon; a pair of scissors mounted on the carriage; a shaft substantially parallel with the guide; an eccentric splined to the shaft; a strap for the eccentric; and a universal joint connection between said strap and the movable element of the scissors.

9. The combination in a shearing machine of a guide; a carriage movable thereon; a pair of scissors mounted on the carriage; a shaft substantially parallel with the guide; an eccentric splined to the shaft; a forked strap for the eccentric; with a member trunnioned to the fork of said strap and having an opening for the reception of a portion of the movable element of the scissors.

10. The combination in a shearing machine of a guide; a carriage movable thereon and including a cam arm; a pair of scissors mounted on the carriage; a shaft extending parallel with the guide; a clutch for connecting said shaft to a source of power; means for maintaining an operative connection between the shaft and the movable element of the scissors while the carriage is being moved on the guide; and a device placed to be actuated by the cam arm for releasing the clutch when the carriage reaches a predetermined position on the guide.

11. The combination of a guide; a carriage movable thereon; a cutter on the carriage; means for driving said cutter; a clutch controlling the transmission of power to said means; a member controlling the release of said clutch; and a cam arm on the carriage placed to engage said member when the carriage reaches a predetermined point to cause release of the clutch.

12. The combination of a supporting structure including a bar constituting a guide; a carriage movable on the guide; a pair of scissors mounted on the carriage; a shaft extending through a portion of the

carriage; an eccentric splined to the shaft and held to the carriage by that portion thereof through which the shaft extends; and means operatively connecting the movable element of the scissors with said eccentric.

13. The combination of a bar having a substantially flat top and undercut to provide a guide; a carriage slidable in said guide; a shaft extending parallel to the bar; a pair of scissors mounted on the carriage; and means splined to the shaft for oscillating the movable element of the scissors as the carriage is moved in the guide.

In witness whereof I affix my signature.

MARTIN O. REHFUSS.