July 10, 1928. 1,676,807

H. D. STEVENS

FLAP TRIMMING MACHINE

Filed July 17, 1925 3 Sheets-Sheet 1

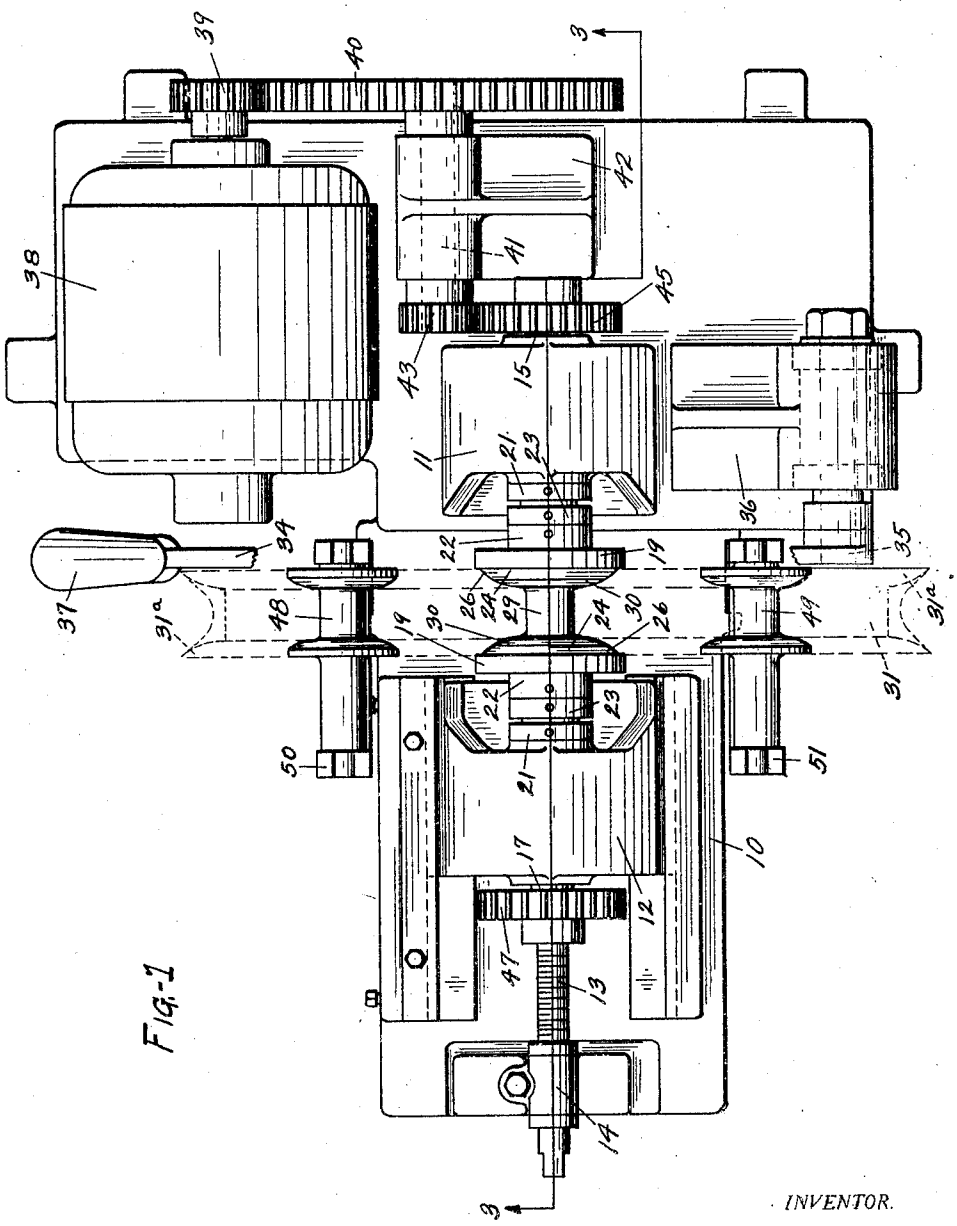


FIG-1

INVENTOR.
HORACE D. STEVENS

BY G. L. Ely.
ATTORNEY.

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H. D. STEVENS

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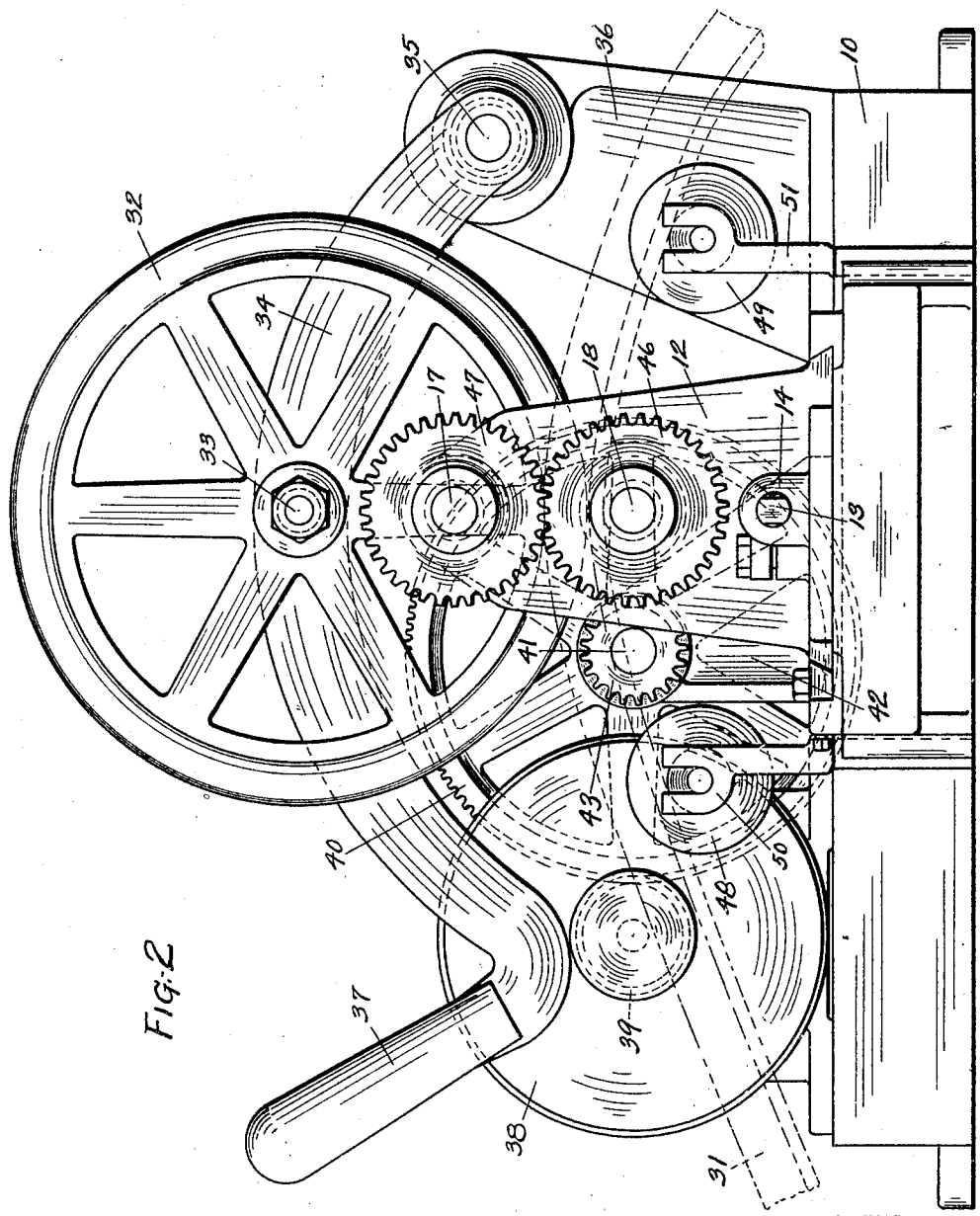


FIG. 2

INVENTOR.
HORACE D. STEVENS
BY
ATTORNEY.

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H. D. STEVENS

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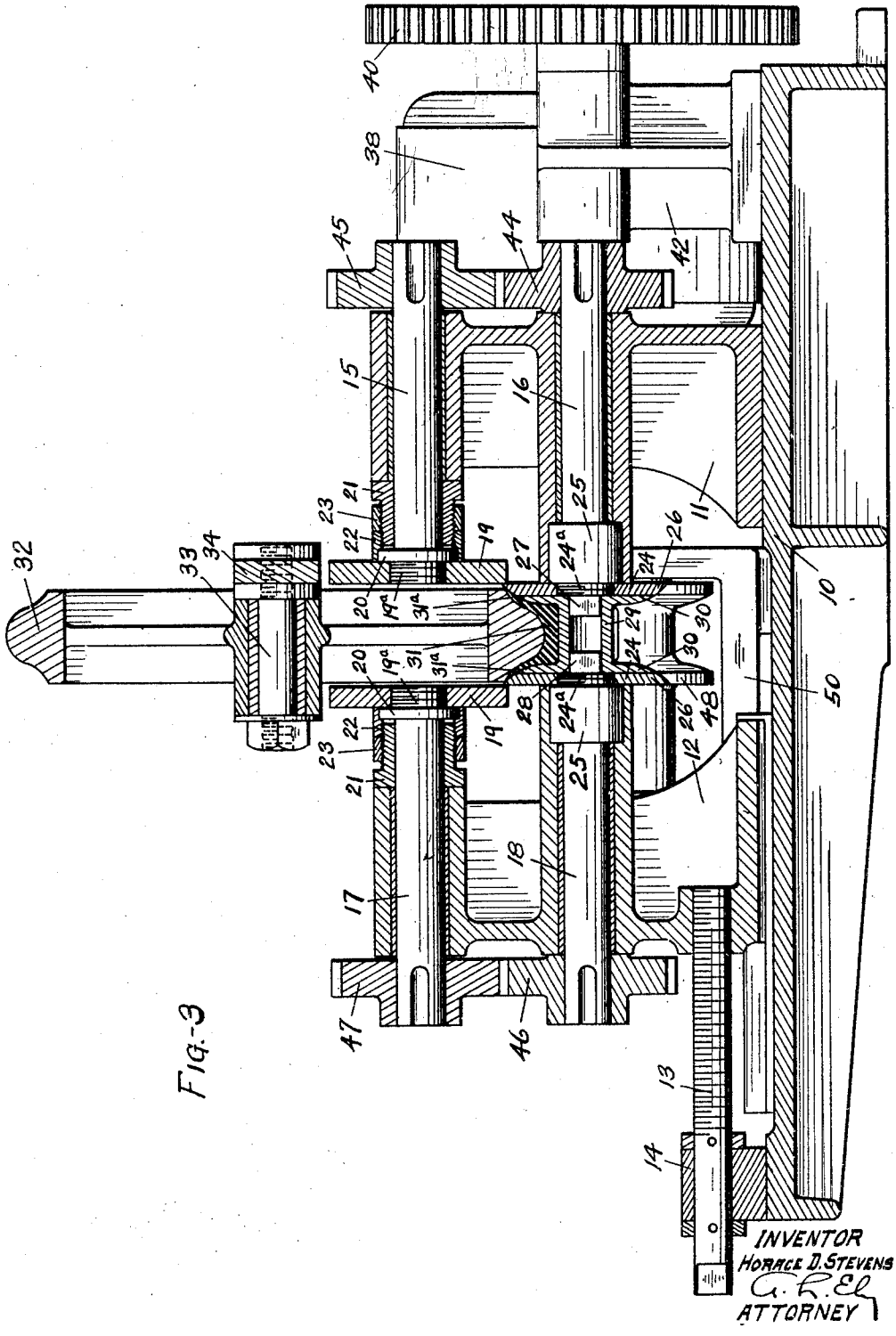


FIG. 3

INVENTOR
HORACE D. STEVENS
G. F. Eh
ATTORNEY

Patented July 10, 1928. 1,676,807

UNITED STATES PATENT OFFICE.

HORACE D. STEVENS, OF AKRON, OHIO, ASSIGNOR TO THE FIRESTONE TIRE AND RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

FLAP-TRIMMING MACHINE.

Application filed July 17, 1925. Serial No. 44,379.

This invention relates to trimming machines, and particularly to machines for trimming molded rubber strips, such as flaps for use in tires or for trimming other similar articles.

The chief object of the invention is to provide a simple, rapid device for effectively trimming flaps or like articles to remove the "flash" or "fins" thereon formed by the molds. The foregoing and other objects are obtained by the construction illustrated in the accompanying drawings and described briefly below. It is to be understood that the invention is not limited to the specific form thereof shown and described.

Of the accompanying drawings:

Figure 1 is a plan of a device embodying the invention;

Figure 2 is a side elevation thereof; and

Figure 3 is a section on line 3—3 of Figure 1.

Referring to the drawings, the numeral 10 indicates a suitable supporting casting on which is fixedly mounted a bracket 11 and on which is slidably mounted a bracket 12, which latter is thus adjustable toward and from bracket 11, an adjusting screw 13 journaled in a bracket 14 being threaded through bracket 12.

Bracket 11 has journaled therein upper and lower shafts 15 and 16 and bracket 12 has journaled therein corresponding upper and lower shafts 17 and 18 respectively aligned with shafts 15 and 16. Each of shafts 15 and 17 has on its inner end a rotary shearing knife 19 threaded thereon as at 19^a against a flange 20. To adjust each knife 18 relative to bracket 11 or 12, a sleeve 21 is provided on each of shafts 15 and 17 on which is threaded a nut 22 and a locknut 23.

Arranged on each of shafts 16 and 18 is a shearing knife 24 adapted to cooperate with a shearing knife 19, each being threaded onto its shaft 16 or 18 as at 24^a against a flange 25. Knives 24 are formed with curved outer edges as indicated at 26, 26 for a purpose later to be explained. Arranged between knives 24 on squared extensions 27 and 28 respectively on shafts 16 and 18 is a combined shaft coupling member and flap-supporting and driving roller 29 formed with flanges 30, 30 so formed as in cooperation with knives 24 to provide a grooved roller shaped to the cross section of a flap to be trimmed, which is illustrated in the drawings at 31.

For urging a flap 31 into said groove, a pressure roller 32 is provided, this roller being formed to fit the outer profile of flap 31 and to spread the wings 31^a, 31^a of the flap so as to be properly trimmed between cooperating knives 19 and 24. Roller 32 is journaled on a spindle 33 carried by an arm 34 pivoted at 35 on a bracket 36 on base 10 and formed with an operating handle 37 for urging the roller 32 against the flap and for elevating roller 32 from between knives 19 to permit inserting a flap 31 into the machine.

The above-described mechanism is arranged to be driven by a motor 38 or other suitable source of power. The shaft of motor 38 has thereon a pinion 39 meshed with a gear 40 secured on a shaft 41 journaled in a bracket 42 on base or support 10. Shaft 41 has thereon a pinion 43 meshed with a gear 44 on shaft 16. Gear 44 meshes with a gear 45 on shaft 15 whereby shafts 15 and 16 are driven in reverse direction. Shaft 18 is coupled with shaft 15 at 29 as explained, and has thereon a gear 46 meshed with a gear 47 on shaft 17 thereby driving shaft 17 in a direction reverse to shafts 16 and 18 and in the same direction as shaft 15.

In order to properly guide the flap 31 between the rotary shearing knives 19 and 24, peripherally grooved rollers 48 and 49 are provided, these rollers being respectively journaled in brackets 50 and 51 arranged on base 10 forwardly and rearwardly of the knives.

In use, the roller 32 is first thrown back out of the way and the flap 31 to be trimmed is inserted in the machine between knife 19 and onto rollers 29, 48 and 49. The roller 32 is then swung into the position shown in Figures 2 and 3, forcing the flap snugly between flanges 30 and spreading the wings 31^a thereof into engagement with knives 19 and 24, the roller 29 and the knives being rotated, thus feeding the flap through the device and progressively trimming the tips of the wings thereof. Either endless flaps or continuous lengths of flap material can be fed through the machine. When a flap is completed, the roller 32 may be again thrown back, the completed flap being withdrawn and another to be trimmed inserted, the above operations being repeated.

To adjust the device for flaps of different sizes or shapes, bracket 12 may be adjusted by screw 13 and the combined coupler and driving roller 29 may be replaced by another of suitable size and shape, the knives 19 and 24 and roller 32 being also readily replaced when necessary.

From the above description, it will appear that an exceedingly simple but effective construction has been devised for the purpose specified. It should be noted that the device is adapted with suitable modifications for general use on articles of substantial U-shape in section, whereby the wings of the U can be accurately trimmed to the proper shape and dimension.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. Apparatus of the class described, comprising spaced pairs of cooperating rotary shearing knives, one pair being relatively movable with respect to the other, a combined coupler and work-supporting and driving roller extending between one set of corresponding knives of each pair, said roller being formed to support U-shaped material between said pairs of knives, a work-pressing roller movable between the other set of corresponding knives for spreading the wings of the U into shearing relation to said cooperating knives, and means for driving one pair of knives adapted by said coupler to drive the other pair of knives.

2. Apparatus of the class described, comprising spaced pairs of cooperating rotary shearing knives, a work-supporting roller removably mounted between one set of corresponding knives of each pair, said roller being formed to support material between said pairs of knives, a work-pressing roller for spreading the sides of the material into shearing relation to said cooperating knives, and means for driving the knives and feeding the material therebetween.

3. A device for trimming material comprising, cooperating pairs of rotary shearing knives, means including a material-supporting roller and a wing-spreading roller for feeding the material between said pairs in such a manner as to feed the sides of said material between the cooperating shearing knives, and adjustable means for removably supporting said rollers, whereby said rollers may be replaced with rollers of a different width for trimming material of a corresponding different width.

4. A device of the class described, comprising spaced pairs of cooperating rotary shearing knives, a combined coupler and feeding roller extending between one set of corresponding knives of each pair, said roller being formed to support material between said set of knives, a roller movable between the other set of corresponding knives for spreading the sides of the material into shearing relation to said cooperating knives, and means for driving one pair of knives adapted by said coupler to drive the other pair of knives.

5. A rotary cutter, comprising relatively movable spaced pairs of cooperating upper and lower shearing knives, means for driving one pair of said knives, and a combined work-supporting and driving roller arranged between corresponding knives of each pair and adapted to couple the other pair of knives to the first pair to be driven thereby.

HORACE D. STEVENS.