W. C. STEVENS.

SELVAGE TRIMMER.

APPLICATION FILED JUNE 5, 1914.

1,306,642.

Patented June 10, 1919.

4 SHEETS—SHEET 1.

Fig. 1

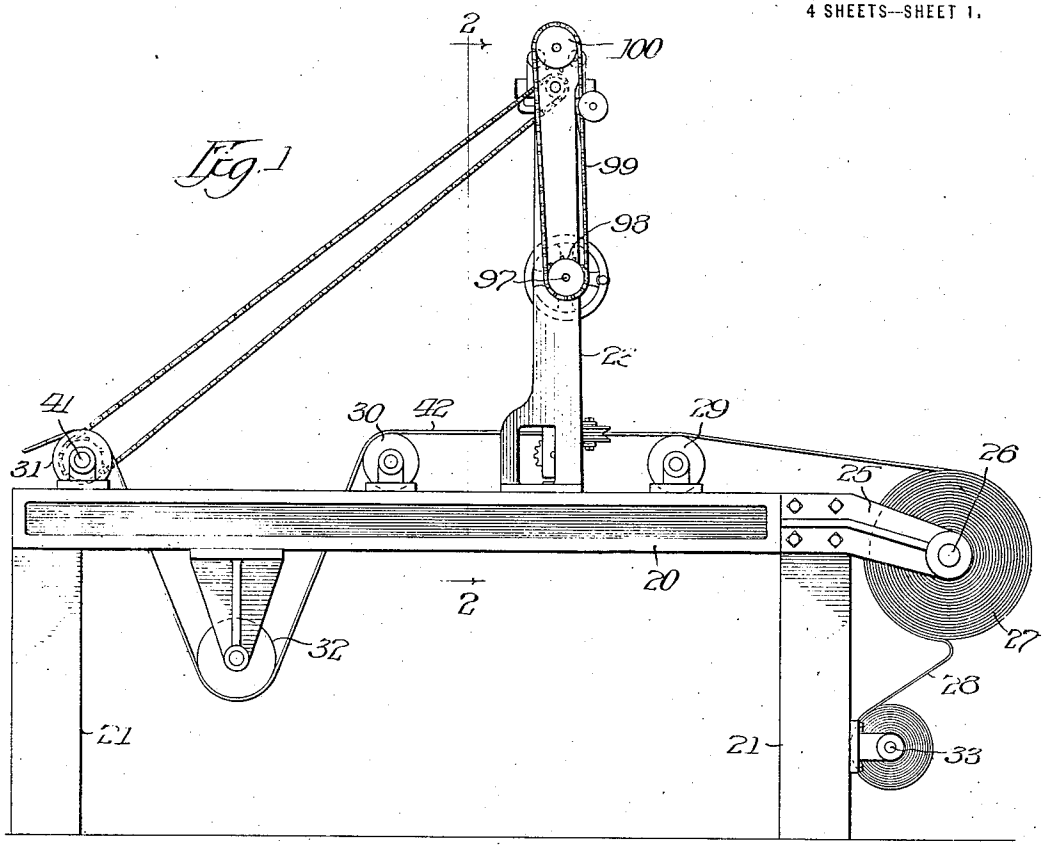
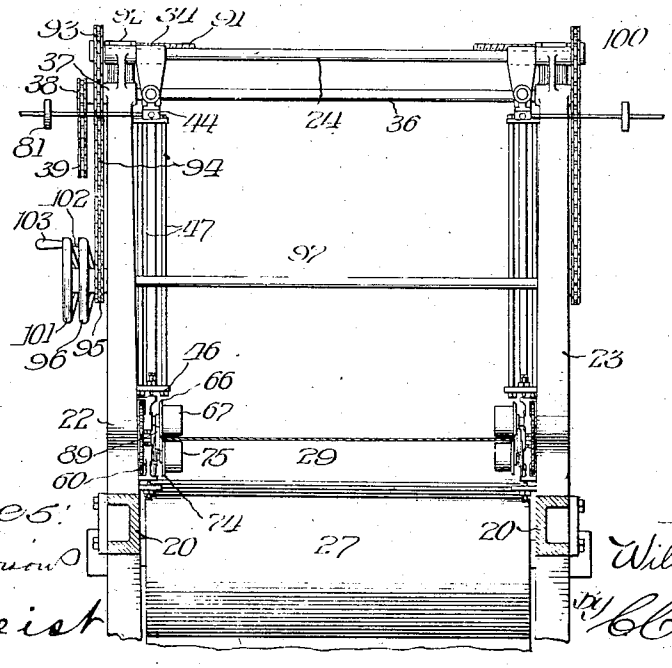


Fig. 2



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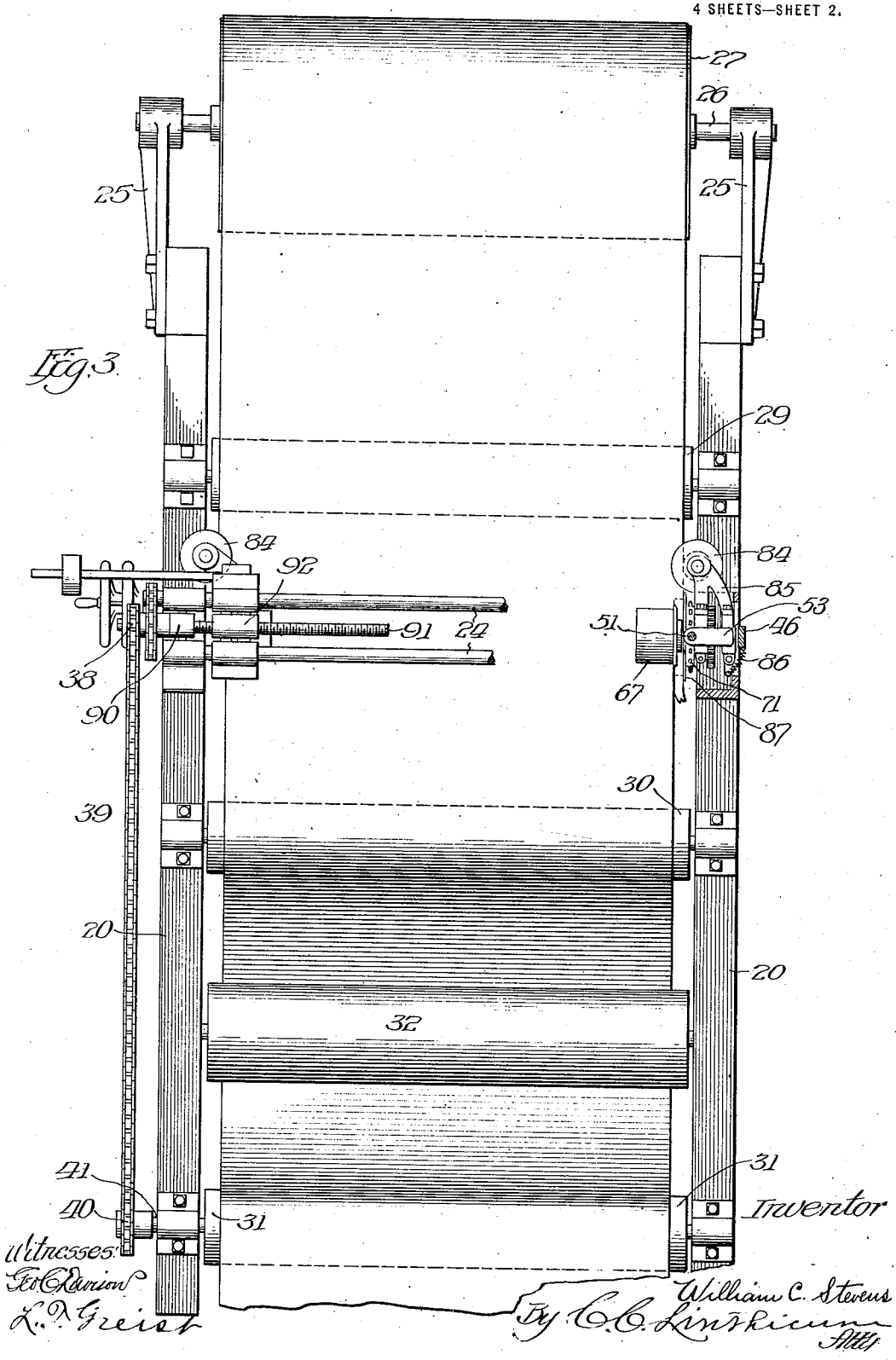

Fig. 3.

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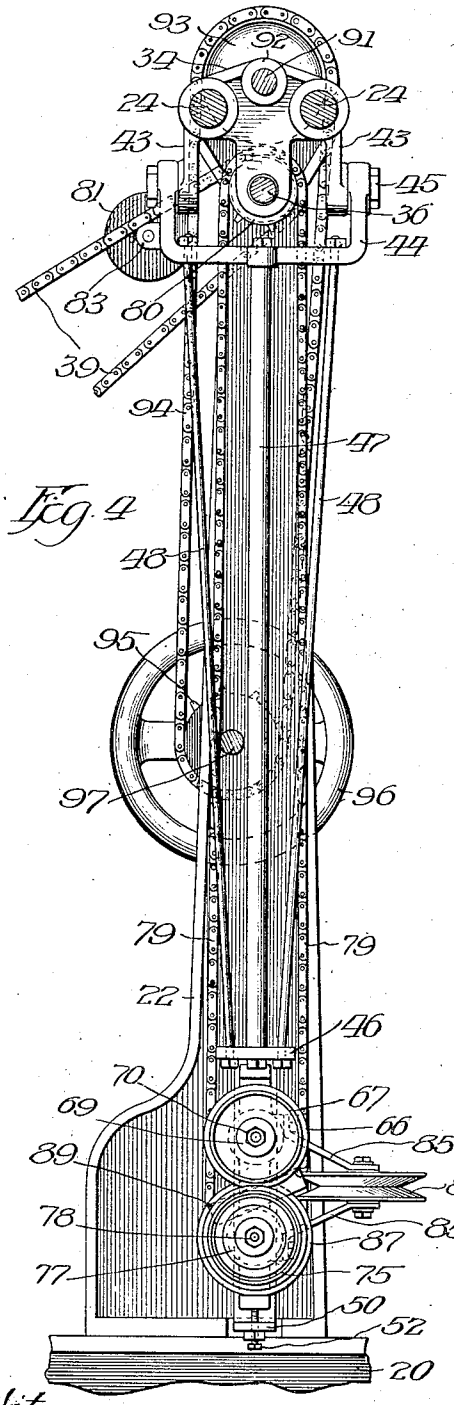

Fig. 4

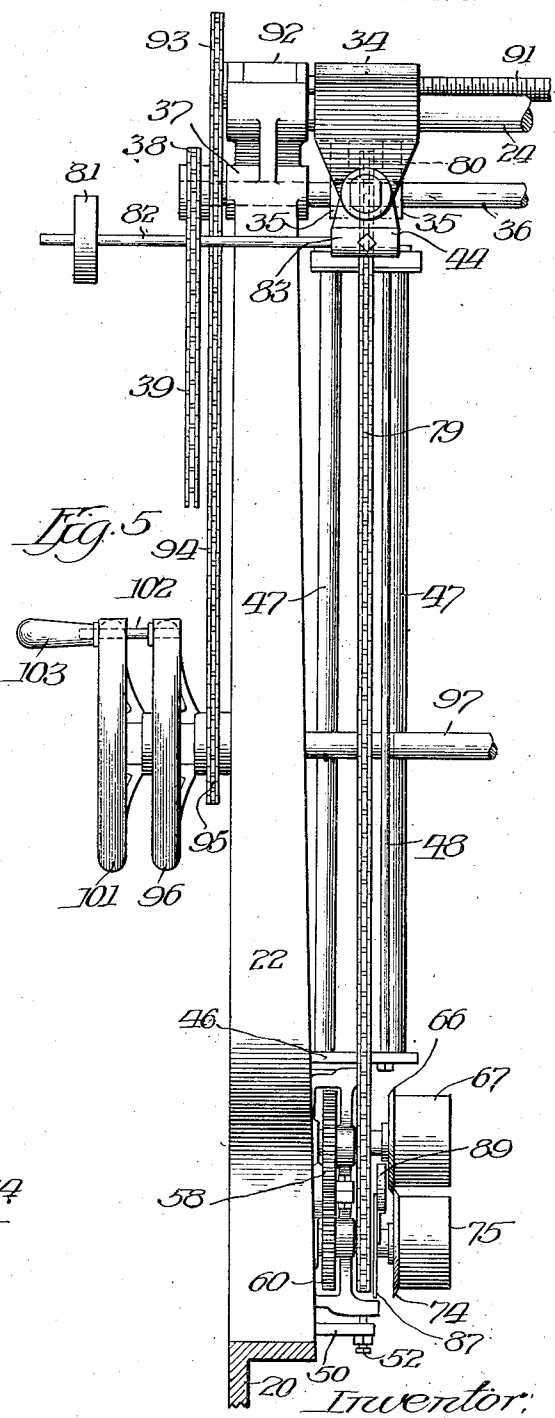

Fig. 5

Witnesses:

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4 SHEETS—SHEET 4.

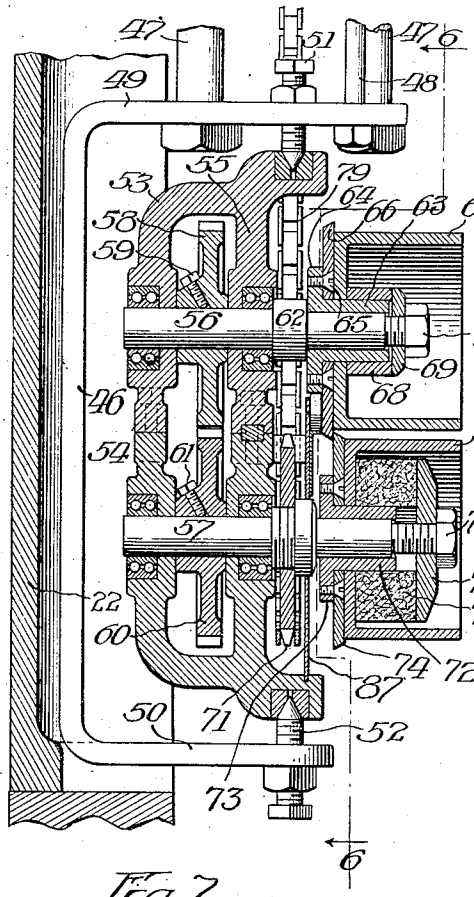

Fig. 7

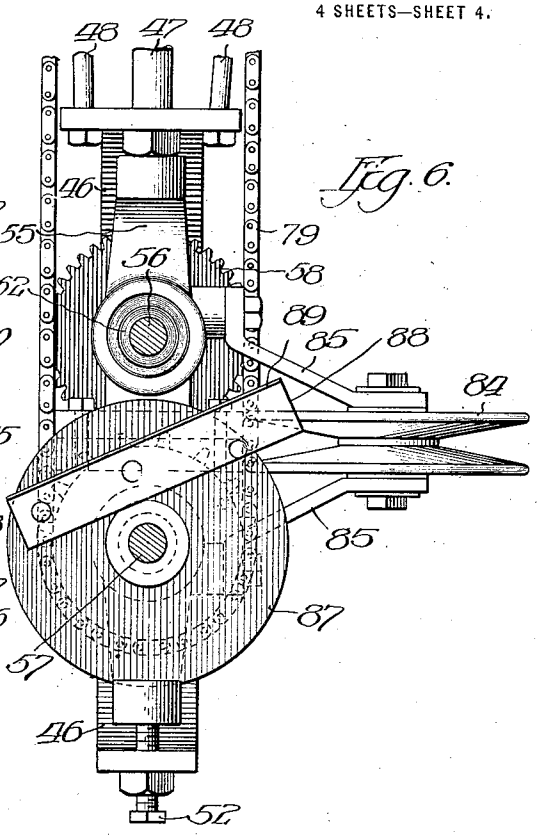

Fig. 6.

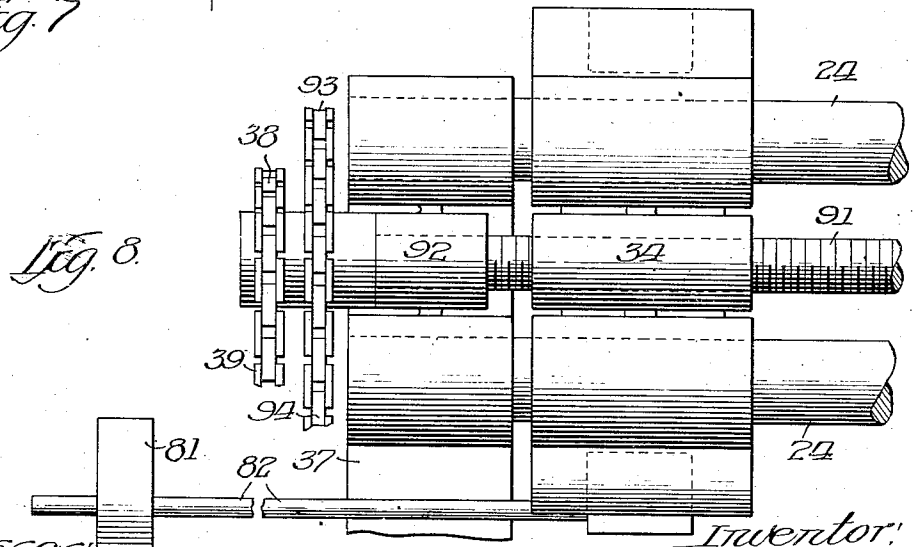

Fig. 8.

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Inventor:

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UNITED STATES PATENT OFFICE.

WILLIAM C. STEVENS, OF AKRON, OHIO, ASSIGNOR TO THE FIRESTONE TIRE & RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

SELVAGE-TRIMMER.

1,306,642. Specification of Letters Patent. Patented June 10, 1919.

Application filed June 5, 1914. Serial No. 843,123.

To all whom it may concern:

Be it known that I, WILLIAM C. STEVENS, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Selvage-Trimmers, of which the following is a specification.

In various arts it is necessary or desirable to remove a narrow edge portion of a sheet or roll of fabric before use, as, for instance, the selvage of textile fabric, and the present invention relates to improvements in machines for accomplishing this result.

Its chief object is the production of a device of this character which shall not only be simple in structure, but shall automatically compensate for inequalities in the width of the material acted on and irregularities in its feed, so that a substantially uniform edge portion of the fabric will be cut off under all circumstances. Although an appliance embodying this invention is susceptible of employment in many arts and industries, it is especially useful in trimming off the selvage portions of the "frictioned" textile fabric used in the manufacture of vehicle wheel tire casings or shoes.

In order that those skilled in this art may fully understand the invention, I have illustrated a desirable embodiment of the same in the accompanying drawings, forming a part of this specification, and to which reference should be had in connection with the following detailed description.

In these drawings—

Figure 1 is a side elevation of a machine, equipped with a trimming mechanism embodying this invention;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1, the parts being viewed in the direction indicated by the arrows;

Fig. 3 is an enlarged plan view of the machine, with certain parts broken away to more clearly illustrate the construction;

Fig. 4 is a face view of one of the trimming mechanisms illustrating the means of support therefor;

Fig. 5 is a side elevation of the mechanism shown in Fig. 4;

Fig. 6 is a section on the line 6—6 of Fig. 7, the parts being viewed in the direction indicated by the arrows, and illustrates the gage wheel, the guide for the trimmed strip, and associated parts;

Fig. 7 is a vertical section of the mechanism shown in Fig. 6, on a plane through the axes of the coöperating cutters or trimmers; and

Fig. 8 is a fragmentary plan view of the top portion of the trimming device, illustrating more especially the means of support and adjustment.

By referring to the drawings, it will be noticed that the appliance comprises a main frame 20, supported on suitable legs 21, 21, and has mounted on its opposite sides a pair of standards 22 and 23, each having a cavity or recess on its inner face, as illustrated more clearly in Figs. 4 and 7. As is shown, these standards are bolted or otherwise secured to the main frame 20 and their upper ends are connected together by a pair of transverse rods 24, 24.

As is shown in Fig. 1, the main frame at one end is equipped with a pair of bearings 25, 25, receiving the shaft 26 of a stock roll 27 of rubber-impregnated, frictioned fabric, the layers of which, as is customary, are separated from one another by an interposed cotton cloth liner 28, which prevents the layers of fabric constituting the roll from adhering to one another.

This trimming device is ordinarily employed in association with a bias cutter, which severs the relatively wide fabric into bias strips, but this cutter is not illustrated in these drawings. In passing to this bias cutter, the frictioned fabric, in leaving the stock roll 27, passes over two rolls 29 and 30, revoluble in suitable bearings mounted in the main frame 20. This strip of fabric also passes over an end roller or drum 31, likewise mounted in bearings on the main frame. Between the rollers 30 and 31 the fabric passes downwardly around another drum or shaft 32, which may be rotatable in suitable bearings on the main frame or which may be employed without any bearings, the mere weight of the shaft or drum keeping the fabric depressed or downwardly looped, in substantially the manner indicated in Fig. 1. Where a trimming mechanism of this character is used in association with a bias cutter which advances the fabric intermittently or

step by step, it is desirable to have the shaft or drum 32 free, that is, unmounted in bearings, so that its weight can take up the slack in the fabric at intervals, whereby it will be always stretched substantially tight and horizontally over the rollers 29 and 30, as illustrated.

The bias machine, while not illustrated, is one which causes the forward travel of the fabric, but it has been deemed unnecessary to illustrate this in connection with the present device, as any suitable form of fabric feeding or advancing appliance may be employed.

On the lower portion of the main frame, as, for example, on a pair of the legs 21, I mount a drum or shaft 33, on which the cotton cloth liner is wound up as it is unwound or paid out from the stock roll 27. This, of course, is a usual expedient in this and other arts.

At each side of the machine I provide a support or member 34, slidable on transverse rods 24, 24, and equipped with a pair of depending spaced ears 35, 35, apertured in alinement for the accommodation of a shaft 36, revoluble in bearings 37 of the two standards 22 and 23. One end of this shaft has fixed thereto a sprocket wheel 38, coöperating with which is a sprocket chain 39, passing around a similar sprocket wheel 40 on the end of the shaft 41 carrying the roller or drum 31. It should be understood that the fabric 42, in passing over the drum 31, revolves the shaft 41 and this rotation is transmitted to the shaft 36 by means of the two sprocket wheels 38 and 40 and their coöperating sprocket chain 39.

The slide head 34 has another pair of depending arms 43, 43, to which a yoke 44 is hinged at 45, the yoke supporting a lower yoke or bracket 46 by means of four rods 47, 47, 48, 48. As is shown in Fig. 7, the yoke 46 has two horizontal arms 49 and 50, equipped with two pivot screws 51 and 52 bearing in sockets in the opposite ends of a support 53, provided with two separated portions 54 and 55, each of which has two ball bearings for the pair of cutter shafts 56 and 57. The upper shaft 56 has a gear wheel 58 fastened thereto, between the parts 54 and 55, by a set screw 59, the teeth of such gear being in mesh with those of another gear 60, fastened in like manner to the shaft 57 by a set screw 61.

The shaft 56 has a collar or enlargement 62, against which bears the face of a sleeve 63, equipped with a flange 64 and to the latter, by means of screws 65, I fasten a circular blade or cutter 66. Fitted over the sleeve 63, and bearing against the face of the cutter, I employ a roller 67, which is held in position by means of a sleeve 68 fitted over the sleeve 63 and bearing against the end of which is a disk or collar 69, an end of the shaft being threaded for the accommodation of a nut 70. These parts are so firmly pressed together by the nut 70 that they all revolve with the shaft 56.

The lower shaft 57, in front of the part 55, has fastened thereto a sprocket wheel 71, and the protruding end of the shaft has thereon a sleeve 72, with a flange 73, to which is fastened, by means of screws, the companion circular cutter or blade 74, which overlaps the blade 66, whereby the desired and proper shearing action on the fabric is attained. The roller 75 has a tight fit on the sleeve or hub 72, and within it I employ a rubber or other suitable cushion 76, against the outer face of which a disk or collar 77 bears, the required pressure between the blades being secured by an adjustment of the nut 78 on the screw-threaded, reduced end of the shaft 57.

The lower shaft 57 is rotated and, of course, its rotation is transmitted to the upper shaft 56 by the intermission gears 60 and 58, by means of a sprocket chain 79, which coöperates with the teeth of the sprocket wheel 71 and also passes around a sprocket wheel 80, mounted on the shaft 36, between the ears 35, 35. In order that the rotation of the shaft 36 may be transmitted to the companion circular cutters 66 and 74, the shaft 36 is provided with a key-way, and the sprocket wheel 80 is equipped with a short key between the ears 35, 35, such key being slidable in the key-way as the sliding head 34 is adjusted by means to be explained hereafter, and acting to compel the rotation of the sprocket wheel 80 with the shaft 36.

In order to give the cutters a tendency to travel inwardly toward the fabric, I provide each yoke or support 44 with a counterweight 81, carried on a rod 82, fastened in any approved manner to the yoke at 83. Obviously, with the parts thus counterweighted, the cutters and their rolls, if free to move, would swing or shift inwardly toward the fabric. It is advisable or necessary to guide the coöperating cutters in their trimming action and, for this purpose, I mount a deeply grooved roller 84, revoluble on a pair of arms 85, 85, supported on the member 54 and, in order to press such gage roller against the edge of the fabric so that it may properly perform its gaging and guiding function, I insert a coiled compression spring 86 between the arms carrying the roller 84 and the adjacent standard or post 22 or 23, as the case may be. Owing to the fact that the fabric being trimmed by the machine has been coated with adhesive rubber and is more or less sticky or tacky, it is desirable to guide the trimmed selvage strip away from the fabric proper and away from the parts of the machine. To effect this result, I mount on the member

54 a thin metal disk 87 (see Figs. 6 and 7), to which is fastened an angle plate 88, the outstanding flange 89 of which acts as a downwardly deflecting guide for the severed strip.

After the fabric or duck has been frictioned or supplied with rubber on the calendering machine and wound up in the stock roll 27, such roll will not be uniform, the fabric shifting more or less lengthwise in one direction or the other on the shaft. The fabric will also vary somewhat in width, owing to the irregularities in its manufacture, and it is therefore, desirable to be able, in a machine of this character, to feed the two cutting mechanisms at the two sides of the machine together, one way or the other, without disturbing their relative adjustment, and it is desirable to be able to bring the cutting mechanisms closer together, or separate them farther apart, as occasion requires.

To effect this result, I provide the following instrumentalities:

Each of the standards 22 and 23, in its uppermost portion, has a bearing 90, in which is revolubly mounted a shaft 91, the inwardly extended portion of which is screw-threaded, as illustrated, for example, in Fig. 3. The screw-threads of both shafts are either right-hand screw-threads or left-hand screw-threads, and each shaft passes through a similarly threaded aperture 92 of its corresponding slide head 34. As the parts are viewed in Figs. 3 and 5, the protruding end of the left-hand shaft 91 is equipped with a sprocket wheel 93, co-acting with a sprocket chain 94, which passes around another sprocket wheel 95 on the hub of a round handle 96, loose on a cross-shaft 97, rotatable in suitable bearings in the standards 22 and 23. The other end of the shaft 97 has fastened thereto a sprocket wheel 98, cooperating with a sprocket chain 99, which passes around another sprocket wheel 100 on the end of the right-hand shaft 91, as the parts are illustrated in Fig. 3. The same end of the shaft 97 on which the handle 96 is mounted has fixed thereto another round handle 101, equipped with a sliding detent 102, which, when in the position shown in Fig. 5, coöperates with the two handles 96 and 101 to lock them together, so that by turning the round handle 101 with the smaller handle 103, both handles 96 and 101 will be rotated and both screw-threaded shafts 91 also rotated to move both slide heads 34, either to the right or to the left, depending upon the direction of rotation of the handle 103. In case it is desired to move either slide head 34 independently of the other, it is merely necessary to slide the detent 102 outwardly away from the handle 96, so that either handle may be thereby revolved in the direction required. In this way the cutters at the opposite sides of the machine may be adjusted simultaneously without disturbing the distance between them, or they may be moved individually to modify their relative relation.

The operation of this mechanism, although indicated above, may be summarized substantially as follows:

The fabric is caused to pass through the machine by any approved means, such, for example, as a bias cutter, not illustrated, the frictioned or rubber-impregnated duck or canvas is unwound from stock roll 27 and passes over the drums or rollers 29 and 30 and, after passing beneath the shaft or drum 32, passes over the end roller 31, the rotation of which, by means of the mechanism shown and described, is transmitted to the shaft 36. The rotation of the latter, by means of the sprocket chains and the sprocket wheels is transmitted to the two sets of trimming knives at opposite sides of the machine. As the fabric passes along, both selvage portions are trimmed off by the positively rotated coöperating circular blades or knives, and the fabric is smoothed by the action of the companion rollers 67 and 75. The pivot points 45 for the swinging frame, and the pivots 51 and 52 for the yoke 53 constitute in effect a universal joint support for the cutters, and owing to the action of the counterweight 81 and the spring 86, the gage wheel 84 follows the edge of the fabric, gages the width of the strip cut off and guides the knives in their cutting action; that is, the knives, under the influence of the spring 86, tend to travel inwardly of the fabric and cut off a wider strip, but are restrained from doing so by the travel of the roller 84 on the edge of the fabric. If the knives did not have such a tendency given to them, they would possibly travel away from the fabric and cease to perform their cutting function. It will be apparent, therefore, that the roller 84 which travels on the edge of the fabric in advance of the knives acts not only as a guide, but also as a gage, determining the width of the severed strip.

The trimmed off, sticky, selvage strip is guided away from the main body of the fabric and away from the parts of the mechanism by the downwardly extended flange 89, so that there is no danger of such strip adhering to the fabric or becoming entangled in the mechanism.

By the rotation of the handles 101 and 96, conjointly or together, the cutting devices may be shifted without destroying their relation, that is, changing the distance between them; or such distance may be increased or decreased by turning the handles separately.

Experience has shown that a device of this character is unusually effective in opera-

tion and, because of its simplicity of construction, it is unlikely to become damaged or deranged. It cuts off from both sides of the fabric selvage strips of substantially uniform width, regardless of variations in the width of the fabric and regardless of the shifting of the fabric to one side or the other, due to its uneven winding on the stock roll.

While I have herein set forth in detail the construction and operation of this preferred embodiment of the invention, it is to be understood that the latter is not limited or restricted to the precise construction shown, since many minor mechanical changes may be made therein, without the sacrifice of the essential features of the invention and without the loss of any of its substantial benefits and advantages.

I claim:

1. In a machine of the character described, the combination of means to support the fabric, a cutter adapted to sever the edge portion of the fabric, a gage adapted to travel on the edge of the fabric, and means tending to press said gage and cutter toward the fabric, substantially as described.

2. In a machine of the character described, the combination of means to support the fabric, a cutter adapted to sever the edge portion of the fabric, a gage mounted on the same support as the cutter and adapted to travel on the edge of the fabric, and means tending to press said gage and cutter toward the fabric, substantially as described.

3. In a machine of the character described, the combination of means to support the fabric, a hinged arm, and a cutter mounted on said arm and adapted to sever the edge portion of the fabric, the center of gravity of the arm and the parts carried thereby and its pivotal point being such that the cutter tends to move toward the fabric, substantially as described.

4. In a machine of the character described, the combination of means to support the fabric, a hinged arm, a cutter mounted on said arm and adapted to sever the edge portion of the fabric, and a gage mounted on said arm and adapted to travel on the edge of the fabric, the center of gravity of said arm and the parts carried thereby and the axis of its hinge being so related that the cutter and gage tend to move toward the fabric, substantially as described.

5. In a machine of the character described, the combination of means to support the fabric, a pair of rotary, coöperating, power-driven cutters adapted to sever the edge portion of the fabric, and means tending to press said cutters toward the fabric, substantially as described.

6. In a machine of the character described, the combination of means to support the fabric, a pair of rotary, coöperating, power-driven cutters adapted to sever the edge portion of the fabric, a gage adapted to travel on the edge of the fabric, and means tending to press said cutters and gage toward the fabric, substantially as described.

7. In a machine of the character described, the combination of means to support the fabric, a cutter adapted to sever the edge portion of the fabric, and a universal joint support for said cutter, substantially as described.

8. In a machine of the character described, the combination of means to support the fabric, a pair of rotary, coöperating, power-driven cutters adapted to sever the edge portion of the fabric, and a universal joint support for said cutters, substantially as described.

9. In a machine of the character described, the combination of means to support the fabric, a pair of rotary, coöperating, power-driven cutters adapted to sever the edge portion of the fabric, a universal joint support for said cutters, and a gage carried by said support and adapted to travel on the edge of the fabric to guide the cutters, substantially as described.

10. In a machine of the character described, the combination of means to support the fabric, a hinged arm, a cutter support pivoted on said arm and adapted to swing in a plane at substantially right angles to that of the movement of the arm, and a cutter mounted on said cutter support and adapted to sever the edge portion of the fabric, substantially as described.

11. In a machine of the character described, the combination of means to support the fabric, a hinged arm, a support pivoted on said arm and adapted to turn in a plane substantially at right angles to that of the movement of the arm, a cutter mounted on said support and adapted to sever the edge portion of the fabric, and a gage mounted on said support and adapted to travel on the edge of the fabric and guide the cutter, substantially as described.

12. In a machine of the character described, the combination of means to support the fabric, an arm hinged at its upper end, a support pivoted in a lower portion of said arm and adapted to turn in a plane at substantially right angles to that of the movement of the arm, a pair of power-driven cutters mounted on said support and adapted to sever the edge portion of the fabric, and a gage mounted on said support and adapted to travel on the edge of the fabric, the axis of the hinge of said arm and the center of gravity of the arm and the parts carried thereby being such that the cutters and gage tend to swing toward the fabric, substantially as described.

13. In a machine of the character described, the combination of means to support the fabric, an arm hinged at its upper end, a support pivoted in a lower portion of said arm and adapted to turn in a plane at substantially right angles to the plane of movement of the arm, a pair of rotary, coöperating, power-driven cutters mounted on said support, a gage wheel mounted on said support and adapted to travel on the edge of the fabric, and means acting on said support tending to swing the latter to bring the gage wheel against the fabric, the axis of said arm hinge and the center of gravity of the arm and the parts carried thereby being such as to tend to move the cutters and gage toward the fabric, substantially as described.

14. In a machine of the character described, the combination of a movable support, a cutter on said support, means for guiding the movement of said support by the fabric and a downwardly inclined member mounted on the support, adapted to guide the severed portion away from the remainder of the fabric.

15. In a machine of the character described, the combination of means to support the fabric, including a roller rotated by the passage of the fabric thereover, a power-driven cutter adapted to sever the edge portion of the fabric, and means to convey the power required to operate the cutter from said fabric roller to the cutter, substantially as described.

16. In a device of the character described, the combination of a main frame, cutters adapted to operate on opposite edges of a strip of fabric, and means capable at the will of the operator of adjusting the cutters laterally of the fabric without modifying the distance between the cutters or of adjusting one of the cutters independently of the other.

17. In a machine for trimming selvage from fabric, the combination of means to support a movable strip of fabric, cutters adapted to act on the edges of the fabric, independently movable supports for each said cutter, and means to guide each support by the edge of the fabric upon which its cutter acts.

18. A device for trimming the selvage from a moving strip of fabric embodying a shiftably-mounted knife, means contacting solely with the edge of the fabric arranged to be shifted by its engagement with the meandering edge thereof, said means having connection with said knife for correspondingly changing the position of the latter.

19. A device for trimming the selvage from a moving strip of fabric embodying a shiftably-mounted knife, means positioned wholly to one side of and constantly held in contacting relation with the edge of the fabric and arranged to be shifted by the meandering edge thereof, mechanism for shifting said knife, said means having connection with the edge-engagement means for inducing corresponding changes of position of the knife.

20. A device for trimming the selvage from a moving strip of fabric embodying a shiftably-mounted knife, mechanism for shifting the position of said knife, means positioned wholly to one side of and normally held in contacting relation with the edge of the fabric and arranged to be shifted by the unevenness of the edge thereof, said means having connection with the mechanism for shifting the position of said knife whereby a change of position of the latter is produced by the changes of position of the edge-engaging means.

21. In an apparatus for trimming selvage from fabric, a support movable transversely of the fabric, a fabric edge contacting member and a cutter carried on said support, and means to maintain said edge contacting member in contact with the fabric edge.

22. In an apparatus for trimming selvage from fabric, a support movable transversely of the fabric, a fabric edge contacting member and a cutter carried on said support, said cutter being located at one side of said edge contacting member a distance equal to the width of selvage to be trimmed, and means to maintain said edge contacting member in contact with the fabric edge.

23. In an apparatus for trimming selvage from fabric, a fabric edge contacting member, a cutter movable transversely of the fabric and means transmitting the lateral movement of the fabric edge to the cutter to cause a corresponding movement of the latter.

In witness whereof I have hereunto signed my name this 26th day of May, A. D. 1914.

WILLIAM C. STEVENS.

Witnesses:
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S. G. CARKHUFF.