July 28, 1936. C. G. RICHARDSON 2,049,023

CLOTH FINISHING MACHINE

Filed June 1, 1933 3 Sheets-Sheet 1

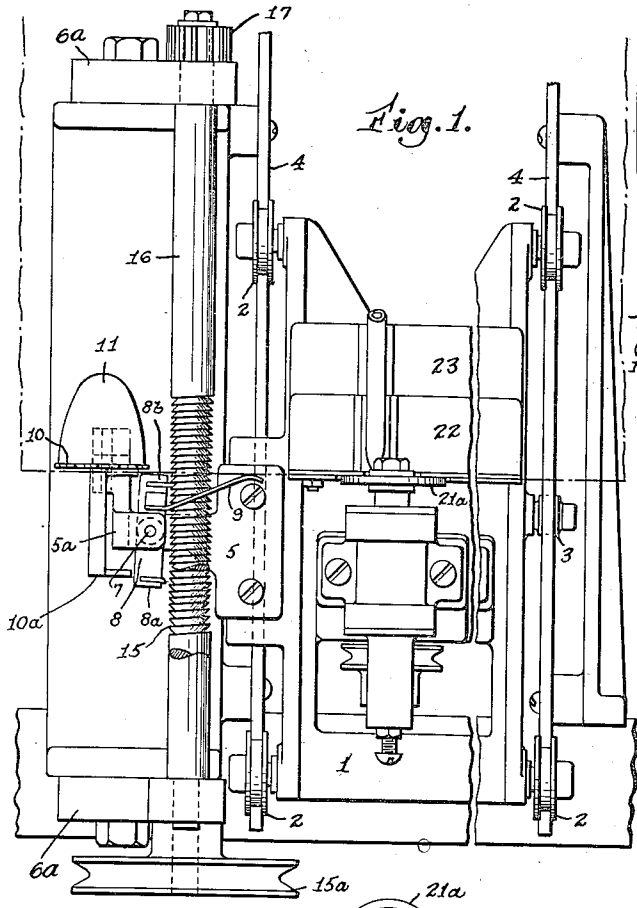


Fig. 1.

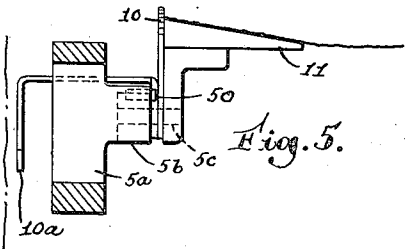


Fig. 5.

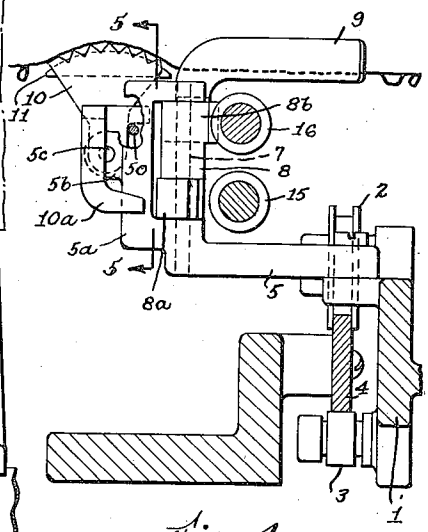


Fig. 4.

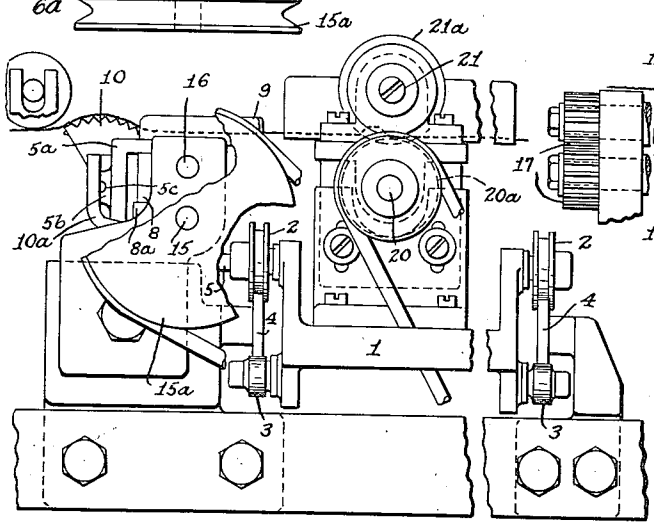


Fig. 2.

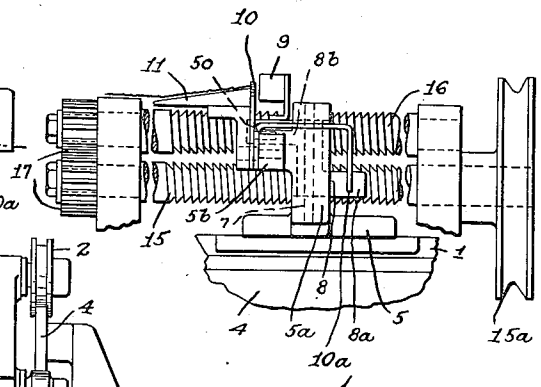


Fig. 3.

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July 28, 1936. C. G. RICHARDSON 2,049,023

CLOTH FINISHING MACHINE

Filed June 1, 1933 3 Sheets-Sheet 2

Fig. 10.

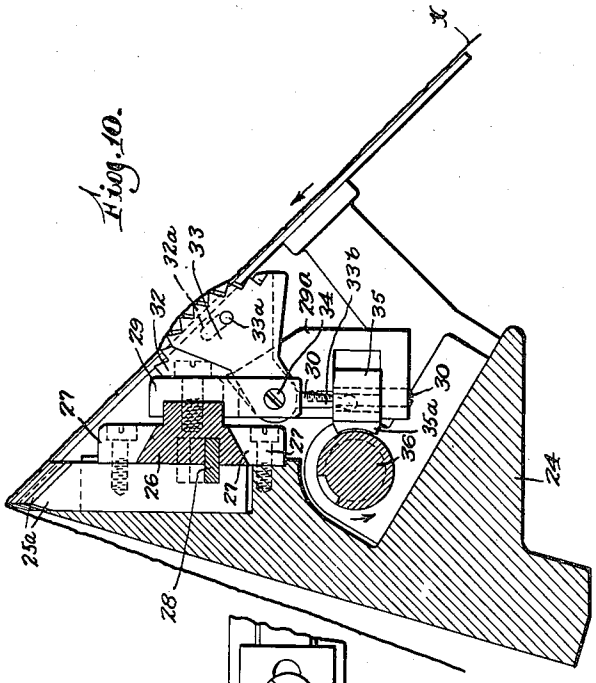


Fig. 12.

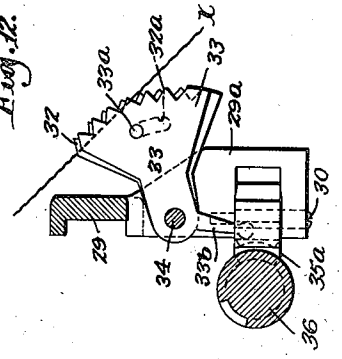


Fig. 11.

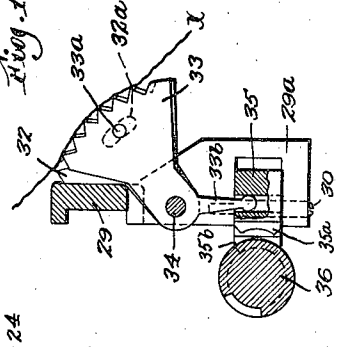
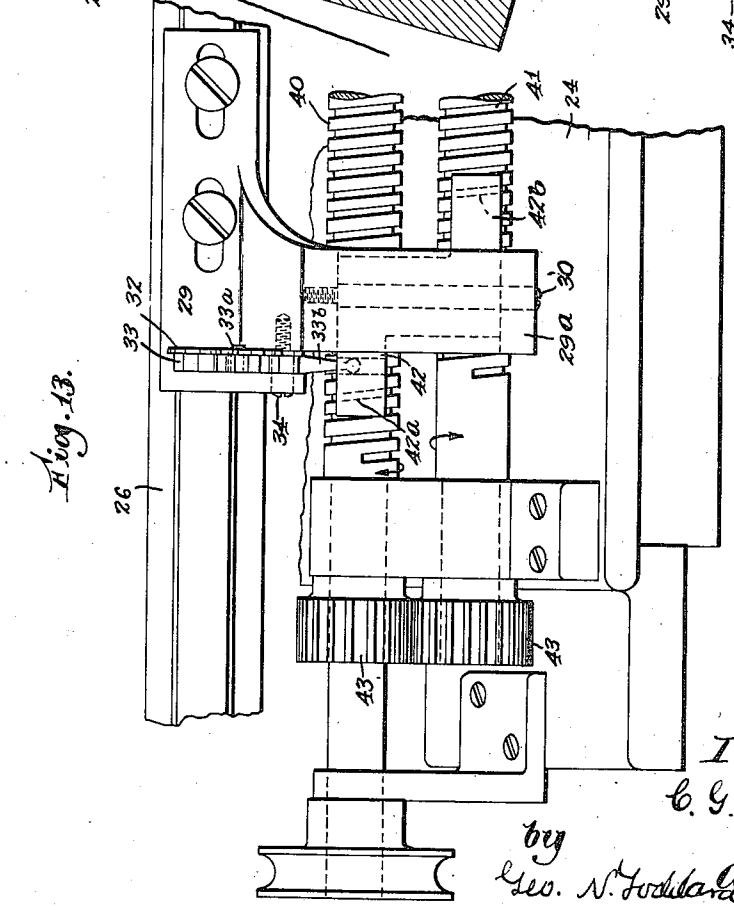


Fig. 13.



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July 28, 1936. C. G. RICHARDSON 2,049,023

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Filed June 1, 1933 3 Sheets-Sheet 3

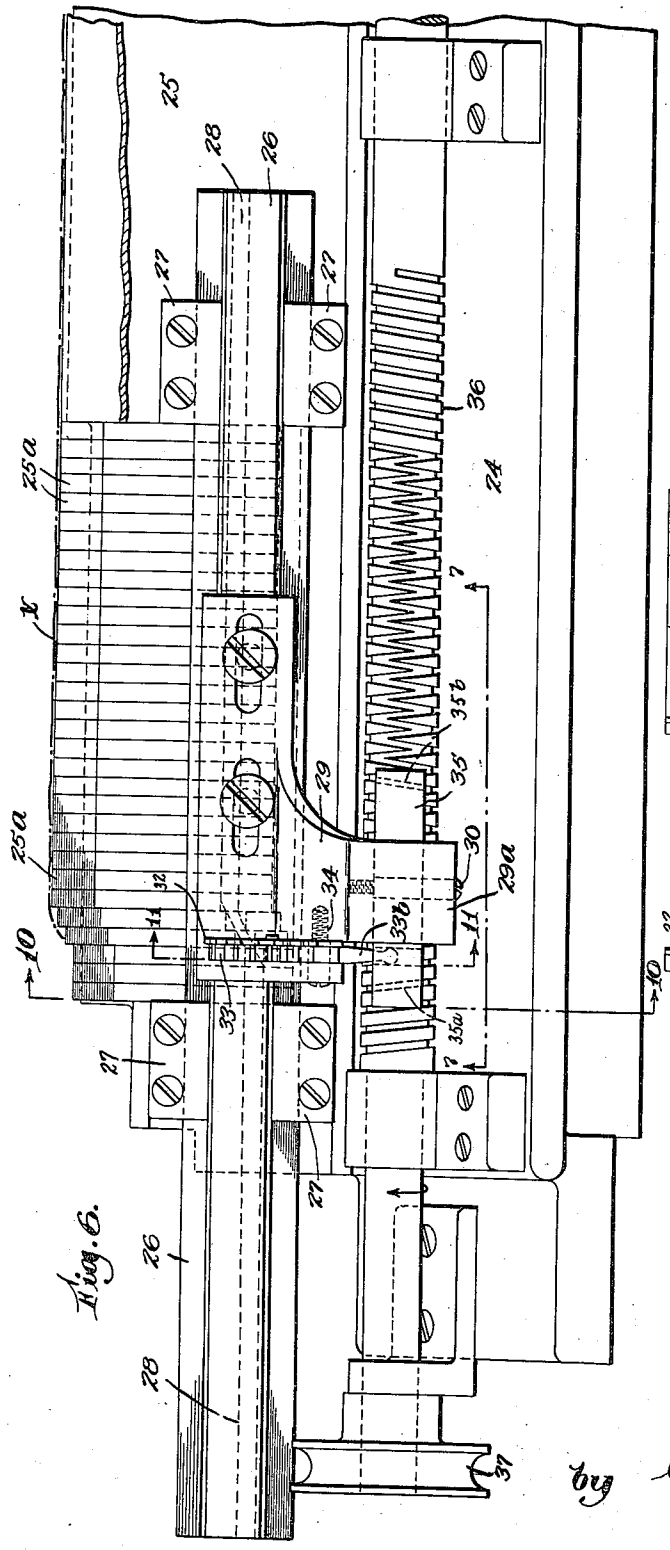


Fig. 6.

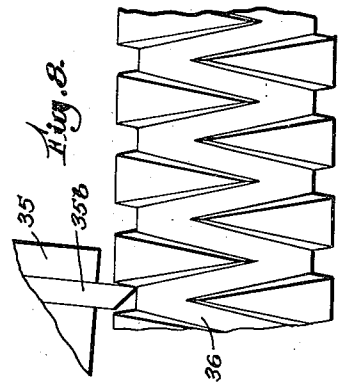


Fig. 8.

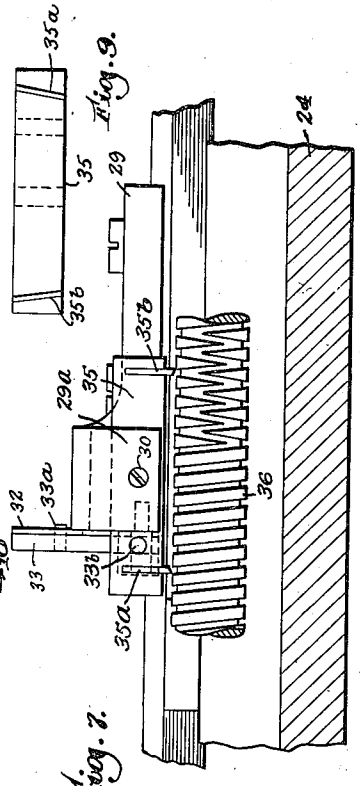


Fig. 9.

Fig. 7.

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Patented July 28, 1936 2,049,023

UNITED STATES PATENT OFFICE

2,049,023

CLOTH FINISHING MACHINE

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Application June 1, 1933, Serial No. 673,848

12 Claims. (Cl. 26—7)

This invention relates to cloth finishing machines and concerns an improvement applicable to different types of such machines in which there is needed, or desired, some provision for correlating the swerving of the cloth travelling through the machine with mechanism that performs some finishing operation on the cloth such as in edge trimming, face shearing, tigering machines, or the like, where the margin or selvage of the cloth is maintained in a desired predetermined relation either to cloth guiding means, or to operating cutters, or to both such elements.

Primarily the essence of the invention resides in the combination of a carrier element movable transversely of the travel of the cloth with which is associated, or connected, in predetermined relation cloth controlled or actuated feelers, that serve to automatically adjust the carrier according to the in and out swerving movements of the marginal portion or the selvage through the medium of rotary reversely acting ratchet mechanism, which shifts the feeler carrier in or out in correspondence with the swerving movements of the cloth. These and other features of the invention will be described in the following specification and will be defined in the claims hereto annexed.

In the accompanying drawings I have illustrated two of the different types of cloth finishing machines to which the improvement is applicable, in which

Fig. 1 is a plan view showing the application of the automatic adjusting means applied to an edge trimming machine.

Fig. 2 is a side elevation of the mechanism shown in Fig. 1.

Fig. 3 is a detail showing in front elevation the ratchet mechanism in conjunction with the feelers.

Fig. 4 is a detail view showing in side elevation details of the feeler mechanism.

Fig. 5 is a detail showing a rearward elevation of one of the feelers.

Fig. 6 is a front elevation of an extensible cloth rest for a shearing machine illustrating the application of this invention to protect the selvage margin of cloth approaching the shearing line.

Fig. 7 is a detail view showing a bottom plan view of the feeler controlled ratchet mechanism.

Fig. 8 is an enlarged view of the ratchet element showing the reverse threaded construction.

Fig. 9 is a detail showing the toothed face of the feeler controlled pawl.

Fig. 10 is a vertical section on plane 10—10 of Fig. 6.

Fig. 11 and Fig. 12 are detail views showing different positions of the feeler mechanism on the plane 11—11 of Fig. 6.

Fig. 13 is a front elevation showing a modified form of the ratchet pawl and feeler devices, in which two separate reversely rotating ratchet screws are employed instead of the double reversely threaded ratchet screw illustrated in Figs. 6–10, inclusive.

In Figs. 1–5 of the drawings, is illustrated an application of this improvement to an edge trimming or loop cutting attachment, in which upper and lower revolving disc cutters are located adjacent to the edge of the cloth in position to trim off the loops or end threads at the margin. In this case, there is a carriage 1 mounted to permit movement transversely of the cloth on guiding and supporting tracks 4 upon which rest the upper rollers or wheels 2 of the carriage and against whose bottom faces lower guide rollers 3 engage to insure straightline transverse movement of the carriage in a fixed plane. Secured to the forward side of the carriage is a bracket 5, which projects toward the front of the machine and has an upwardly projecting portion or standard 5^a in which is mounted a vertical pivot pin 7, which carries a double tooth pawl 8 which has at its bottom portion an outwardly projecting tooth carrying member 8^a and on the inner side of its upper portion an inwardly projecting tooth carrying member or boss 8^b.

At the level of the respective teeth carrying members of the pawl 8 are disposed upper and lower screw threaded rotary ratchet members or screws 16 and 15, both having the same pitch. On the lower ratchet member 15 is secured a driving pulley 15^a, while at the inner ends of the ratchet screws are secured intermeshing pinions 17 which communicate rotation from screw 15 to screw 16, but in the reverse direction. It will be understood that when the tooth at 8^a is moved into engagement with the rotary ratchet thread 15 the pawl will be forced inwardly and, as it is supported in the bracket 5 fast on the carriage 1, the carriage necessarily moves inward with it. On the other hand, when the inner tooth member at 8^b is moved into engagement with the ratchet thread 16, then owing to the reverse rotation of the ratchet screw 16 the carriage will be moved outwardly. The ratchet screws 15 and 16 are mounted in fixed bearing members 6^a suitably secured to the frame of the machine.

I will now describe the means by which the desired movements of the carriage in correspondence with the in and out swerving movements

of the cloth is obtained. The upward extension 5a of the feeler carrying bracket 5 is provided with an inwardly offset lug 5b, which carries a horizontal transverse pivot pin 5c on which is pivotally mounted a serrated sector-shaped feeler 10, to whose inner face is attached a convex inclined cloth guiding member 11 adapted to receive and support the marginal portion of the cloth travelling through the machine. This feeler 10 has a downwardly and rearwardly extending toe member 10a whose tip lies opposite the lower offset tooth carrying member 8a of the pawl.

When the edge portion of the cloth engages the teeth or serrations at the top edge of the feeler 10, the feeler is rocked rearwardly against the stop pin 50 carried by the bracket 5a and in that position the toe piece 10a is out of engagement with the pawl member 8a, so that the pawl is in neutral or inactive position. Should the edge of the cloth swerve inwardly so as to be disengaged from the serrations of the feeler 10, then the feeler drops under its unbalanced weight turning in a counterclockwise direction, so that the tip of the toe 10a presses against the forward face of the tooth carrying member 8a of the pawl and forces the tooth into engagement with the lower ratchet screw 15. This results in immediately moving the carriage inward until the carriage overtakes the inwardly moving cloth and the feeler 10 is again engaged by the cloth and restored to neutral position by the rearward drag of the cloth against its teeth.

On the other hand, if at any time the cloth should swerve outwardly beyond the line of the feeler 10, it will then press outwardly against a light finger or spoon 9 that is secured to the top face of the tooth member 8b and, as the cloth presses the tip end of the finger or spoon 9 outwardly the tooth at 8b is swung into engagement with the upper reversely rotating ratchet member 16, so that the carriage and the feeler, which it carries, move outwardly until the feeler finger 9 is no longer pressed outward by the cloth and the tooth 8b is released from the action of the cloth pressing against the finger 9. Since the cloth engaging portion of the feeler finger 9 is, in the neutral position of the pawl, slightly beyond the line of the serrated feeler 10, no further shifting of the carriage with its feeler carrier will take place until the cloth again swerves in or out.

In this particular machine, the finishing mechanism comprises a lower rotary disc cutter 20a secured to a rotary shaft mounted in suitable bearings on the carriage 1 and an upper rotary disc cutter 21a mounted on the upper shaft 21 with the edge of the two discs slightly in overlapped contact with each other. Just inwardly of the disc are the upper and lower cloth guiding plates 22, 23 which guide the edge of the travelling cloth in close proximity to the coacting cutter discs. As this edge trimming cutter construction is the invention of Harold E. Burr and forms no part of the present improvement, particular details of the cutter mechanism need not be explained. Their use here is merely to illustrate the application of the present invention to an edge trimming or loop cutting attachment.

A somewhat modified construction of the cloth controlled mechanism for maintaining correct relationship between the guiding or finishing mechanism of a cloth finishing machine is illustrated in Figs. 6–12. In these figures of the drawings I have shown the improvement suitably applied to control the extensible portions of a cloth rest for a well known type of cloth shearing machine.

Figs. 6 and 10 of the drawings illustrate the transverse cloth rest beam 24 of a well known type of cloth shearing machine in which the cloth travels over a peak or acute angle cloth rest to present the nap or face of the cloth to the shearing elements, not here shown. That portion of the cloth rest actually illustrated comprises the left hand extension members as viewed from the front of the machine and a portion of the middle fixed or solid rest 25 adjacent thereto.

As is well understood in the art, the solid or fixed portion 25 of the cloth rest is continued laterally by a series of parallel slides or extension joints 25a arranged side by side and extending out to the adjacent side of the machine. These extensions or so-called joints are notched on their rear faces to receive a horizontal rearwardly disposed cam bar 28, whose inner portion is vertically offset from the outer portion, the two portions being integrally united by the usual inclined middle portion, which acts as a cam for raising and dropping the extension joints in a well known manner, as illustrated in Figs. 6 and 10. The cam bar 28 is secured to the rear face of a transversely slidable carriage or carrier 26 adapted to slide across the rear face of the cloth rest and held in sliding engagement therewith by means of suitable overlapping brackets or plates 27.

To the forward face of the slidable carriage 26 is adjustably attached a hanger 29 having a downward extension 29a. As the drawings illustrate the left end portion of the cloth rest, I provide on the left side of this carriage an inner thin light serrated feeler 32 and an outer heavier serrated feeler 33 pivotally supported side by side on a pin 34, that is tapped horizontally into the hanger 29. As shown in Figs. 10–12, the outer feeler 33 carries an inwardly projecting pin 33a which projects through an arcuate slot 32a formed in the inner feeler so that the two feelers are connected by a lost motion connection. The outer heavier feeler 33 has a downwardly extending ball end finger 33b which projects into a vertical bore formed in the dog or double tooth pawl 35, which is mounted for oscillation in a horizontal plane on the vertical fulcral pin 30 secured in the downward extension 29a of the feeler carrying hanger.

Directly to the rear of the oscillating ratchet pawl 35 is mounted a rotary ratchet screw 36 which may be rotated in the direction shown by the arrow in Fig. 6 by a belt pulley 37. This ratchet screw 36 is provided with right and left hand screw threads at each end which overlap and continue by each other at the middle portion of the ratchet so as to provide a reverse action upon the respective pawl teeth 35a and 35b carried by the pawl 35. It should be particularly noted, as best shown in Fig. 8, that each helical thread of the ratchet is cut with sides that are slightly flared outwardly in order to facilitate the easy release of the pawl teeth from engagement therewith.

When the cloth is running in contact with only the inner feeler member 32, it rocks that feeler upward to the limit of its rocking movement, as shown in Fig. 10, and in this position the feeler 33 is raised slightly so that the finger 33b, which is seated in an opening in the pawl 35, is in the vertical or middle position. Should the cloth swerve inwardly from the inner feeler, both feelers drop under the influence of gravity, thus

causing the finger 33[b] of the outside feeler 33 to move the outer or left hand tooth 35[a] into engagement with the inwardly acting thread of the ratchet, as shown in Fig. 12, so that the carriage or carrier 26 will be shifted inwardly until the edge portion of the cloth reengages the inner feeler 32, which is then returned to neutral position shown in Fig. 10 so that through the medium of the pin and slot connection at 33[a] with the outer feeler 33 the pawl is restored to, and retained in, neutral position.

Should the cloth edge swerve outwardly beyond the feeler 32 into engagement with the feeler 33, then the feeler 33 will be swung upward by such engagement to move the outer end of the pawl outwardly from neutral position and shift the inner tooth 35[b] into engagement with the outwardly acting ratchet thread until the outer feeler has passed outward beyond the edge of the cloth. In this position the outer heavier pawl 33 is released and through the pin and slot engagement is enabled to return the pawl 35 to neutral position. Since the cam bar engaging the notches in the rear faces of the extension joints 25[a] is fast on the slidable carrier 26, the projection and retraction of the joints will take place according to the location of the intermediate cam portion of the bar and the margin or selvage of the cloth x will drop below the shearing line and escape injury from the shearing cutters.

Instead of combining the reversely acting ratchet threads in a single rotary shaft, as shown in Fig. 6, I may use as in the edge trimming machine illustrated in Fig. 1, separate reversely rotated ratchet members 40 and 41 employing a pawl or dog 42 having also an inwardly projected vertically offset tooth 42[b] engaging the lower ratchet member 41, the two rotary members of the ratchet being interconnected by pinions 43 as in the form shown in Fig. 1.

It will therefore be seen that the pawl or dog supported by the carriage oscillates in a horizontal plane about a vertical axis, so that the dog is neutral so far as any gravity action is concerned and with the double acting feelers it may be positioned in a neutral or inactive position, or it may be shifted into engagement with one or the other reversely acting ratchet threads to compel the carriage to move outward or inward in accordance with the outward or inward swerving movement of the cloth. It will also be seen that the improvement is applicable to various types of cloth finishing machines to secure any desired correlation between the edge of the cloth as it swerves in and out and coacting portions of the mechanism with which it is associated.

Since the pawl itself, when mounted on a vertical axis, is mechanically inert, it is very readily responsive to actuating movements of the cloth controlled feelers and is moved only from neutral position by the action of the feeler mechanism. By reason of the positive actuating connection between the heavier outer feeler and the pawl, the pawl may be positively controlled for retention in either one of the three positions.

What I claim is:

1. In a cloth finishing machine, the combination with a carriage movable transversely of the travel of the cloth, separate inner and outer feeler devices pivotally supported thereby in position to be engaged by the edge portion of the travelling cloth, said feelers being movable about axes angularly disposed to each other, continuously rotating reversely acting threaded ratchet mechanism mounted in proximity to said carrier and extending in parallelism with the movement of the carrier, a feeler controlled pawl pivotally supported by said carrier in position to be operatively engaged with one or the other of the reversely acting threads to effect inward and outward movement of the carrier in correlation with inward or outward swerving movements of the edge of the cloth.

2. In a cloth finishing machine, the combination with a reversely threaded rotary ratchet mechanism arranged transversely of the travel of the cloth, a carrier movable transversely of the cloth arranged in proximity to said ratchet mechanism, a pawl pivotally supported by said carrier to be rocked about a substantially vertical axis in position for operative engagement with one or the other of the reversely acting threads of the ratchet, inner and outer cloth actuated feelers arranged adjacent the edge of the cloth and actuated respectively as the edge of the cloth swerves in or out to shift the pawl from neutral position to engagement with one or the other of said threads to cause the carriage to move in or out in correlation with the swerving of the cloth.

3. In a cloth finishing machine, the combination of a carriage movable transversely of the cloth, carriage shifting means embracing reversely acting threaded rotary ratchet mechanism, and pawl teeth movable in a substantially horizontal plane for engagement, respectively, with one or the other reverse threads to shift the carriage in or out in correlation with the inward and outward swerving of the cloth edge, and separate cloth controlled feelers adjacent the edge of the cloth for causing movement of the respective pawl teeth from neutral position to active engagement with its coacting ratchet thread, one of said feelers acting when alone engaged by the cloth to hold the pawl against movement from neutral position.

4. In a cloth finishing machine, the combination with parallel reversely acting rotary ratchet screws arranged transversely of the travel of the cloth, a transversely movable carriage, reversely acting pawl teeth supported by the carriage in proximity to the respective ratchet screws to permit engagement of each tooth with its coacting screw to move the carriage in or out in correlation with the inward and outward swerving movements of the cloth edge, and cloth controlled feelers, each arranged to shift its corresponding pawl tooth from neutral position to operative engagement with the corresponding ratchet screw, whereby correlation of the carriage adjustment with the swerving edge of the cloth is maintained, one of said feelers acting when alone engaged by the cloth to hold the pawl against movement from neutral position.

5. In a cloth finishing machine, the combination of a carriage movable transversely of the cloth, parallel ratchet screws mounted adjacent to, and parallel with, the path of carriage movement, reversely acting pawl teeth pivoted to move in a plane disposed at an angle to the plane including the axes of both screws, and inner and outer cloth controlled feelers coacting with the respective teeth to engage the respective teeth with its coacting ratchet screw, the inner feeler acting when alone engaged by the travelling cloth to maintain the pawl in neutral position.

6. In a cloth finishing machine, the combination of a carriage for adjusting the position of movable members of the finishing mechanism in correlation with the in and out swerving movements of the cloth edge, carriage shifting mech-

anism embracing rotary reversely acting ratchet mechanism, reversely acting pawl teeth arranged to coact with said ratchet mechanism, and separately operable cloth controlled feelers for actuating, respectively, one or the other of the reversely acting teeth to shift the carriage in or out in correlation with the swerving movements of the cloth edge, a stop member arranged to limit the cloth actuated movement of one feeler to keep the pawl at neutral position when the other feeler is out of engagement with the cloth.

7. In a cloth finishing machine, the combination with a carriage movable transversely of the cloth, parallel reversely acting rotary ratchet screws, reversely acting pawl teeth coacting with the ratchet screws respectively, the pawl teeth being mounted to move about an axis parallel to the plane including the axes of said ratchets, and being mutually offset to each other in the direction of their axes to permit engagement with the coacting ratchet screws, and separately operable cloth controlled feelers, each acting according to the position of the cloth to shift one pawl tooth into active engagement with its ratchet screw and thereby effect movement of the carriage in the direction of the swerving of the cloth edge.

8. In a cloth finishing machine, the combination with a movable carriage acting to position members of the cloth finishing means according to the in and out swerving movements of the edge of the cloth, reversely acting rotary ratchet mechanism arranged adjacent said carriage, a pawl having reversely acting ratchet teeth movable about a substantially vertical pivot to engage one tooth or the other with the rotary ratchet mechanism, a feeler secured to said pawl with its free end located normally outside the edge of the cloth and movable under the outward pressure of the cloth against it, a second feeler located inwardly of the normal position of the first feeler and movable when out of contact with the cloth to impart to said pawl a movement in the opposite direction to that imparted by the first-named feeler.

9. In a cloth finishing machine, the combination of a carriage movable transversely to the edge of the travelling cloth, rotary reversely acting threaded ratchet mechanism for effecting the shifting of the carriage in and out, a double tooth ratchet pawl pivotally supported by said carriage in position to rock the teeth into engagement with their coacting ratchet threads respectively, a cloth controlled feeler having positive actuating connection with said pawl to retain the pawl at neutral position or in engagement with either one of the ratchet threads according to the position of the cloth with relation to said feeler.

10. In a cloth finishing machine, the combination with a carriage movable transversely to the edge of the travelling cloth, carriage shifting means embracing rotary reversely acting threaded ratchet mechanism arranged in proximity to the carriage, and a mechanically inert double tooth ratchet pawl pivotally supported by the carriage and normally at rest in neutral position, cloth controlled feeler means for retaining the pawl in neutral position or in either position of engagement with the reversely acting ratchet threads according to the relative position of the cloth to said feeler.

11. In a cloth finishing machine, the combination with a carriage movable transversely to the edge of the cloth, carriage shifting means embracing rotary reversely acting threaded ratchet mechanism, a double tooth pawl pivotally supported by the carriage in position to permit its teeth to have opposite actuated engagement with the reversely acting threaded ratchet mechanism respectively to move the carriage in and out, cloth actuated feelers, one of which is movable in the plane of the cloth, the other of which is movable in a plane substantially perpendicular to the cloth, said feelers acting respectively to shift the pawl from neutral position into engagement with one or the other of said ratchet threads.

12. In a cloth finishing machine, the combination of a carriage movable transversely to the edge of the cloth, carriage actuating mechanism embracing reversely acting threaded ratchet mechanism, and a pawl pivotally supported by the carriage and movable from neutral to active position in engagement with one or the other of said ratchet threads, a cloth actuated feeler having positive actuating connection with said pawl, and a second separately movable cloth actuated feeler operated by gravity to cause the shifting of said pawl to reverse active position.

CHARLES G. RICHARDSON.