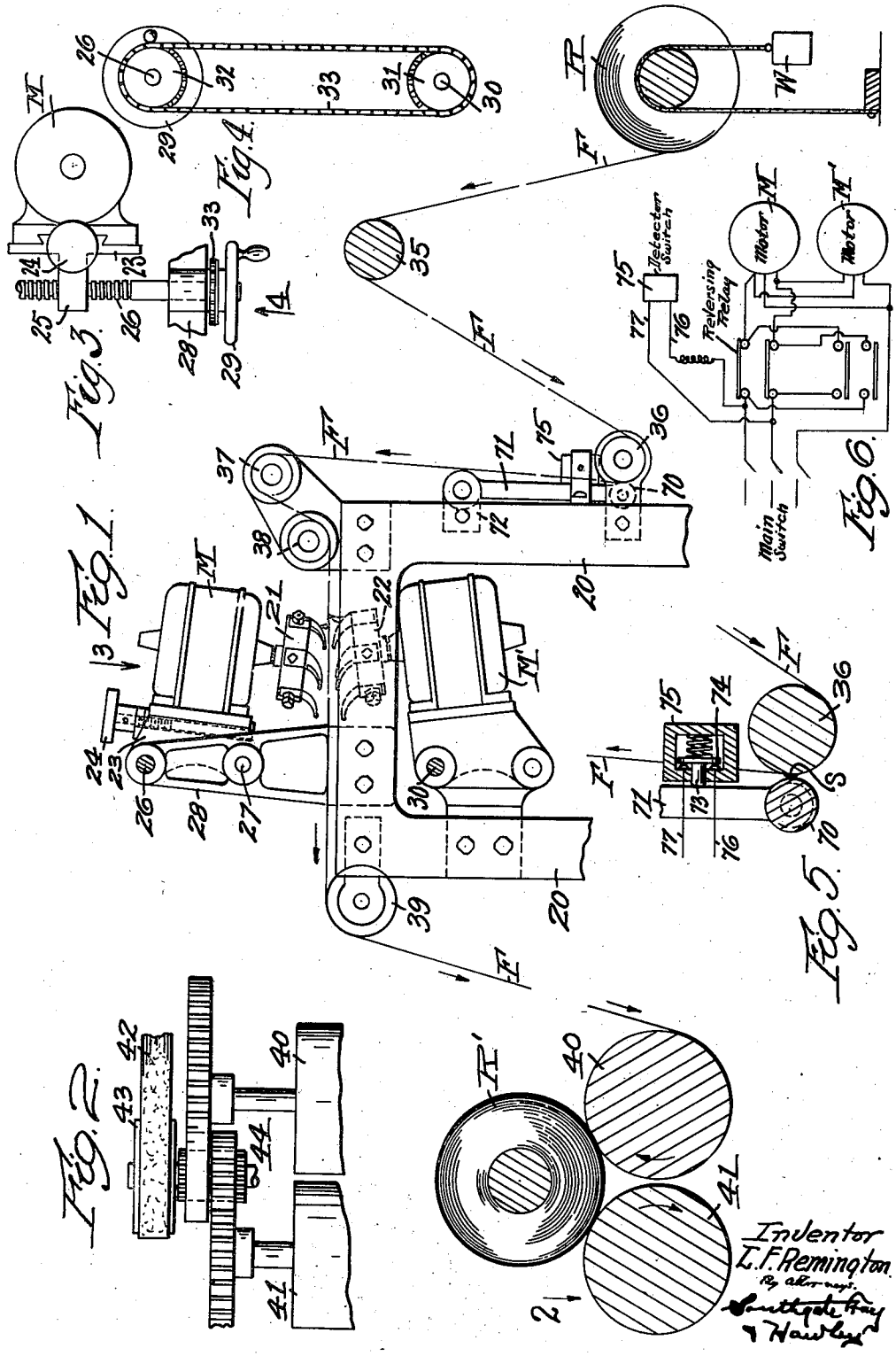
July 6, 1937. L. F. REMINGTON 2,086,392

MECHANISM FOR SEVERING SELVAGE LOOPS OR FLOAT THREADS

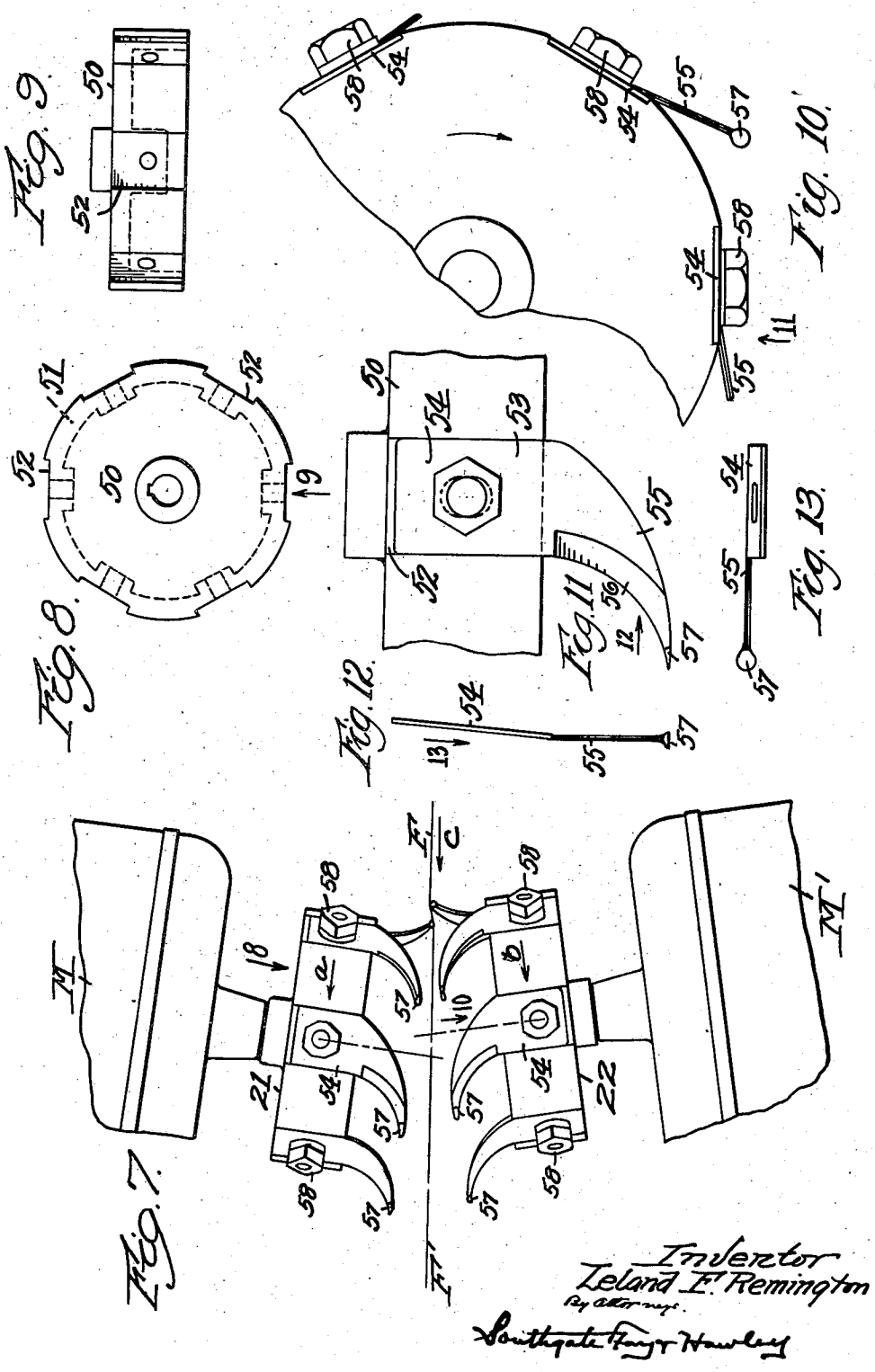
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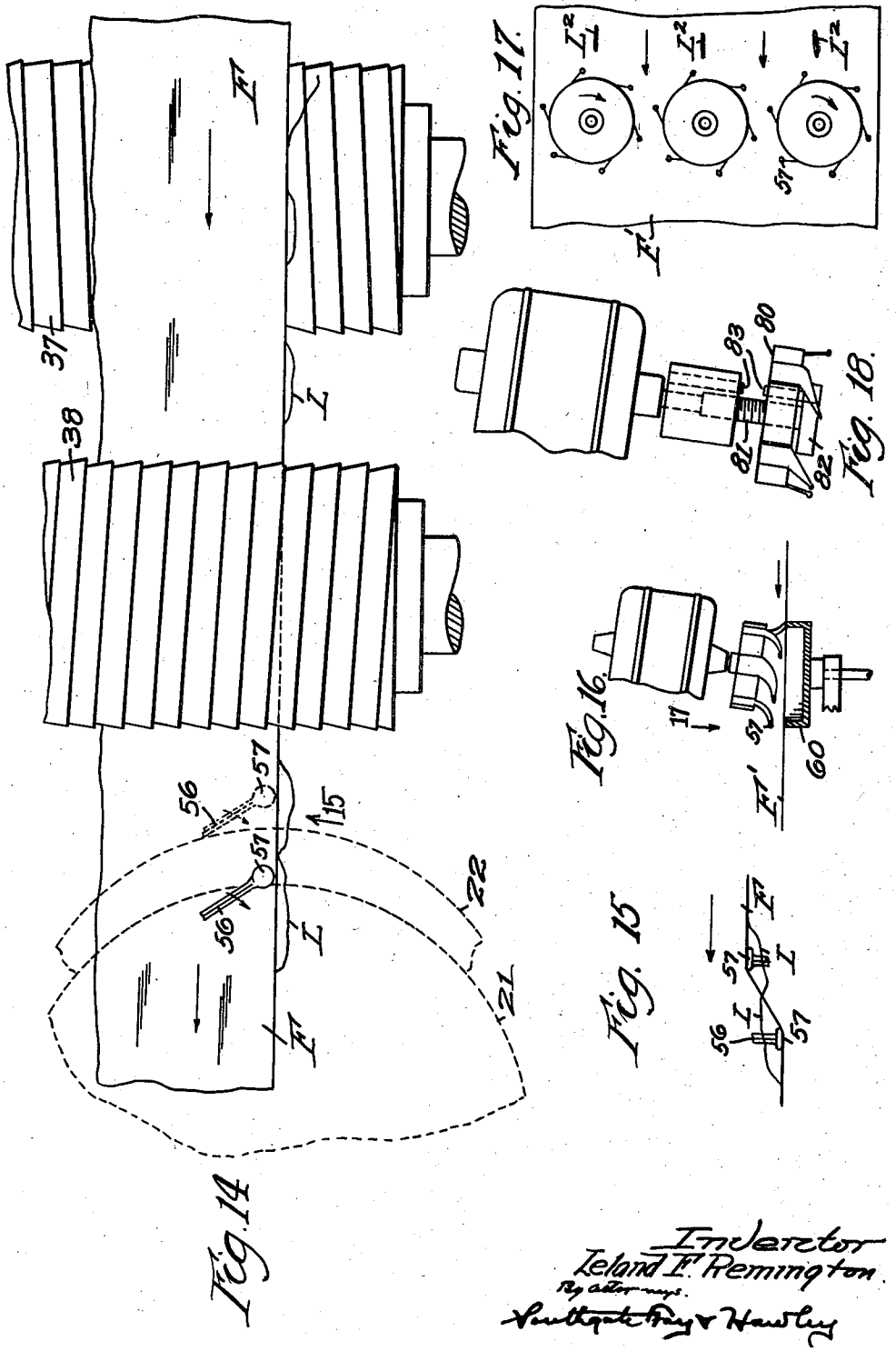
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July 6, 1937. L. F. REMINGTON 2,086,392

MECHANISM FOR SEVERING SELVAGE LOOPS OR FLOAT THREADS

Filed Dec. 9, 1935 3 Sheets-Sheet 3



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2,086,392

MECHANISM FOR SEVERING SELVAGE LOOPS OR FLOAT THREADS

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Application December 9, 1935, Serial No. 53,458

24 Claims. (Cl. 26—11)

This invention relates to cloth finishing apparatus and more particularly to improved mechanism for parting or severing selvage loops or float threads.

A selvage loop is formed during the operation of a drop box loom whenever any shuttle is restored to action after being maintained idle for a plurality of picks. Each loop comprises the portion of a weft thread which extends for a greater or less distance along the selvage from the point in the fabric at which a shuttle became inactive to the point at which the same shuttle again became active.

The term "float thread" is used to indicate more generally any thread in any part of a fabric which forms a loop and is free from attachment to the fabric except at its ends. Float threads may extend either warp-wise or weft-wise.

It is obviously necessary that all such selvage loops and float threads be removed from the fabric, and this work has usually been performed with shears, manually operated.

It is the general object of my invention to provide improved mechanism for severing such selvage loops or float threads, so that the severed ends may be thereafter readily trimmed as the fabric is passed through any usual shearing machine.

A further object of my invention is to accomplish the severing of the selvage loops or float threads without noticeably pulling the threads in the fabric and without cutting or otherwise injuring the fabric itself. I also provide mechanism for this defined purpose which is capable of operation at exceptionally high speed.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a side elevation, partly diagrammatic showing my improved severing mechanism;

Fig. 2 is a partial plan view of certain driving mechanism, looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is a plan view of certain transverse adjusting mechanism, looking in the direction of the arrow 3 in Fig. 1;

Fig. 4 is a side elevation of parts of said adjusting mechanism, looking in the direction of the arrow 4 in Fig. 3;

Fig. 5 is an enlarged sectional end elevation of a detector device and switch appearing in Fig. 1;

Fig. 6 is a diagrammatic view of certain electrical control and operating mechanism;

Fig. 7 is an enlarged side elevation of the loop-severing heads;

Fig. 8 is a plan view of one of the heads, looking in the direction of the arrow 8 in Fig. 7;

Fig. 9 is a side elevation, looking in the direction of the arrow 9 in Fig. 8;

Fig. 10 is an enlarged partial plan view of the lower head, looking in the direction of the arrow 10 in Fig. 7;

Fig. 11 is an enlarged side elevation of one of the severing elements;

Fig. 12 is an edge view thereof, looking in the direction of the arrow 12 in Fig. 11;

Fig. 13 is a plan view thereof, looking in the direction of the arrow 13 in Fig. 12;

Fig. 14 is a plan view illustrating the operation of my improved severing mechanism;

Fig. 15 is a detail side elevation, looking in the direction of the arrow 15 in Fig. 14.

Fig. 16 is a side elevation, partly in section, showing the application of my invention to the severing of float threads on the body of the fabric;

Fig. 17 is a detail plan view, looking in the direction of the arrow 17 in Fig. 16, and

Fig. 18 is a side elevation showing a modified construction of severing head.

Referring to Fig. 1, I have shown my improved severing mechanism mounted on a frame 20 and comprising an upper severing head 21, preferably driven by a reversible motor M, and a lower severing head 22, preferably driven by a reversible motor M'.

The upper severing head 21 and associated motor M are mounted for convenient adjustment both vertically and transversely with respect to the fabric F. The motor M is shown as being mounted on a bracket 23 and as being vertically adjustable thereon by means of an adjusting screw 24. The bracket 23 preferably has an upper lug or projection 25 (Fig. 3) threaded to receive a cross feed screw 26, and a lower lug or projection having a cylindrical opening to receive a cross rod 27.

The feed screw 26 is rotatably mounted in brackets 28 at opposite sides of the frame 20 and is provided with a hand wheel 29 (Fig. 3) by which it may be turned to adjust the motor M and severing head 21 transversely relative to the fabric F. The cross rod 27 is also mounted in the brackets 28 but is held in fixed position.

Similar provision is made for supporting and transversely adjusting the motor M' and sever-

ing head 22, the transverse adjustment being effected by a feed screw 30, preferably connected to the upper feed screw 26 by sprockets 31 and 32 and a sprocket chain 33 (Fig. 4). Vertical adjustment of the lower head and motor is commonly unnecessary.

Any suitable provision may be made for drawing the fabric F under tension through the severing mechanism and between the upper and lower severing heads. As shown diagrammatically in Fig. 1, the fabric F is drawn from a cloth roll R, the rotation of which is frictionally retarded by a weight W. The fabric passes around guide-rolls 35 and 36 and over and under spreader rolls 37 and 38 as it approaches the severing heads, and then passes over a guide-roll 39 and around a winding drum 40 to a second cloth roll R', which is freely supported on the winding drum 40 and on a second and associated winding drum 41. Any suitable provision is made for rotating the drums 40 and 41, such as a belt 42, pulley 43 and gear train 44 as shown in Fig. 2.

While my invention as thus far described may be used as a separate and independent severing mechanism, I also contemplate the use of the invention as forming a preliminary attachment to a cloth shearing machine, in which case the winding mechanism shown in Figs. 1 and 2 would be omitted, and the fabric F would pass directly from the guide roll 39 to associated parts of a shearing machine. For the purposes of this application it is immaterial whether the mechanism operates as a separate unit or in combination with a shearing machine.

The details of construction of the severing heads 21 and 22 are shown in detail in Figs. 7 to 13 inclusive. Each head comprises a supporting portion or body 50 (Fig. 8), preferably having a cylindrical outer flange 51 provided with a series of transverse and axially extending grooves 52 which receive severing elements 53.

Each severing element 53 comprises a slotted body portion 54 (Fig. 11) and a knife portion 55 having a curved upper severing edge 56 and an enlarged, blunt and non-cutting end portion 57. The knife portion 55 is preferably disposed at a slight angle to the slotted body-portion 54, as shown in Figs. 12 and 13, and each severing element 53 may be secured in one of the transverse grooves in the supporting portion or body 50 by a clamping bolt 58.

The severing heads normally rotate in the directions of the arrows *a* and *b* in Fig. 7, it being assumed that the fabric F is traveling in the direction of the arrow *c*. It will be noted that each knife portion 55 of a severing element 53 projects substantially axially with respect to the supporting portion or body 50 of the associated severing head, and that it also projects forward in the direction of rotation.

When adjusted for operation as shown in Fig. 7, the ends 57 of the severing elements 53 are positioned to rotate in planes at a slight angle to the plane of the fabric F, the planes of the elements of the two heads being oppositely disposed with respect to the plane of the fabric. The ends of the severing elements engage the upper and lower faces of the fabric as the fabric approaches the heads, but substantially clear the fabric as the fabric leaves the heads.

It will also be noted that the axes of the two severing heads are not only angularly disposed with respect to each other, but that they are also offset in the direction of fabric travel, as indicated by the broken lines in Fig. 7. By reason of this longitudinal offset, the end portions 57 of the severing elements of the upper head 21 travel in a path which will intersect at one point the plane in which the end portions 57 of the severing elements of the lower head 22 rotate.

As a result, the fabric is displaced from its normal plane of travel as it passes between the severing heads, this action being indicated with some exaggeration in Fig. 15. This somewhat abrupt bending of the fabric tends to relax the selvage loops L as the cloth is engaged by the severing elements, and the loops are thus more readily picked up by the non-cutting end portions 57 of the severing elements and thereafter severed by the knife portions 56.

The severing heads are operated at relatively high speed, so that the severing operation is practically instantaneous and no perceptible pulling of the threads in the fabric takes place. Furthermore, the severing elements follow each other in such rapid succession that it is practically impossible for a loop to be drawn past both severing heads without being caught and severed by one of the severing elements of either the upper or the lower head.

It is sometimes desirable to utilize my invention for severing the loops formed as float threads on the body of a fabric F' (Figs. 16 and 17). For such purposes a plurality of severing heads may be mounted in series transversely of the cloth and in such positions as to engage the rows of loops L^2 to be severed.

When thus operating on one face only of a fabric, a simple cup-shaped support for the under side of the cloth may be substituted for the lower severing head. Such a support is indicated at 60 in Fig. 16, and has the form of an upwardly flanged disc over which the fabric F' is drawn. The non-cutting end portions 57 of the severing elements preferably rotate in an inclined path intersecting at one point the plane of the fabric and slightly depressing the same within the cup-shaped support, all as previously described.

In the commercial operation of my invention, successive pieces of fabric are commonly stitched together and it is desirable to prevent operation of the severing heads when a seam is passing between them. For this purpose I preferably provide reversing motors M and M' for the severing heads, together with means for automatically controlling the same.

Referring to Figs. 1, 5 and 6, I have shown a detecting device comprising a roll or bar 70 extending across the machine parallel to the guide-roll 36 and pivotally supported by arms 71 mounted to swing on brackets 72 secured to the frame 20. One of the arms 71 engages a plunger 73 (Fig. 5) on a spring-pressed circuit-closing element 74 in a detector switch 75.

When the arm 71 is in normal position, the weight of the arm 71 and roll 70 displaces the circuit-closing element 74 and breaks the circuit between connecting wires 76 and 77. When, however, a seam as S (Fig. 5) passes around the guide-roll 36, the detector bar or roll 70 is swung to the left as viewed in Fig. 5, releasing the plunger 73 and circuit-closing element 74 in the detector switch 75 and thus completing a control circuit which will promptly reverse the direction of rotation of the motors M and M' and continue the reverse rotation until the seam has passed beyond the field of the severing operation. For a further explanation of the operation of the detector

switch and motor control, reference is made to the prior application of C. H. Coolidge, Serial No. 4,347, filed January 31, 1935.

It is in some cases desirable that the severing heads be separated when reversed, and for this purpose I may utilize the modified construction shown in Fig. 18, in which the upper severing head 80 has a freely threaded connection with its motor shaft 81 or with an extension thereof.

When rotating in the normal or operative direction, the screw-threaded connection tends to move the head 80 downward into engagement with the enlarged end portion 82 of the motor shaft, which thus forms a lower stop and determines the operative position of the severing head. As soon, however, as the motor is reversed, the inertia of the head 80 causes the motor shaft to turn relative to the head and to thus lift the head substantially above its operating position, stops 83 limiting the upward movement.

Having described the details of construction and the method of operation of my improved severing mechanism, it will be seen that I have provided a simple and effective device for severing selvage loops or float-threads in such manner that they may be thereafter cut in the usual shearing machine.

It will be further seen that my improved severing mechanism comprises simple and continuously rotating parts which may be operated at relatively high speeds. In practical operation it is found that the fabric may be handled at speeds as high as sixty or eighty yards per minute without decreasing the effectiveness of the severing operation or in any way endangering or injuring the fabric.

While I have shown the planes of rotation of the severing elements as being at a slight angle to the plane of the fabric, it may be found desirable with certain fabrics to materially increase this angle.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a rotating severing head comprising a plurality of loop-severing elements moving in a plane nearly but not quite parallel to the plane of the fabric so that said loop-severing elements engage the loops at one side only of the axis of said head, and means to support said fabric against the pressure of said elements by engagement with the opposite face thereof.

2. In a loop-severing mechanism, a pair of severing heads operating simultaneously on opposite faces of a piece of fabric, and means to rotate said heads, each head slightly displacing the fabric relative to the plane of operation of the other head as the fabric passes between said heads.

3. Mechanism for severing selvage loops and float threads in a piece of fabric which comprises a pair of heads having severing elements engaging opposite faces of the fabric, and means to rotate said heads in the same direction with respect to the cloth, the planes of rotation of said heads and severing elements being oppositely inclined with respect to the normal plane of the fabric.

4. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a pair of rotating severing heads each having a plurality of loop severing elements projecting axially therefrom, said heads being mounted to effect substantially simultaneous engagement of said elements with both faces of a piece of fabric drawn therebetween, and each head being rotatable about an axis nearly but not quite perpendicular to the plane of fabric travel so that said loop-severing elements engage the loops at one side only of the axis of said head.

5. In a loop-severing mechanism, means to guide a piece of cloth through said mechanism in a predetermined plane, two sets of severing elements respectively engaging opposite faces of a piece of cloth drawn therebetween, the ends of each set of severing elements traveling in a closed path in a plane definitely inclined to the plane of the cloth, and said planes intersecting each other closely adjacent the respective points of engagement of said sets of severing elements with said cloth.

6. In a loop-severing mechanism, a pair of severing heads each comprising a plurality of severing elements circumferentially arranged, means to rotate said heads, and means to position said heads so that the cloth-engaging ends of the severing elements of one head describe a circumferential path cutting the plane of rotation of the ends of the severing elements of the other head.

7. In a loop-severing mechanism, a pair of severing heads each comprising a plurality of severing elements circumferentially arranged, means to rotate said heads, and means to position said heads so that the cloth-engaging ends of the severing elements of one head describe a circumferential path cutting the plane of rotation of the ends of the severing elements of the other head within the circumferential path of travel thereof.

8. Mechanism for severing selvage loops and float threads in a piece of fabric which comprises means to guide a piece of fabric in a predetermined plane, a severing head rotatable in a plane forming a slight angle to the plane of the fabric, said head having severing elements projecting substantially axially therefrom and engaging one face of the fabric adjacent the loops to be severed, and means to support the opposite face of the fabric adjacent the path of movement of said severing elements.

9. Mechanism for severing selvage loops and float threads in a piece of fabric which comprises means to guide a piece of fabric in a predetermined plane, a severing head rotatable in a plane inclined with respect to the plane of the fabric, said head having severing elements projecting substantially axially therefrom and engaging one face of the fabric adjacent the loops to be severed, and a second and similar severing head rotatable in a plane reversely inclined with respect to the plane of said fabric and having axially extended severing elements engaging the opposite face of said fabric.

10. Mechanism for severing selvage loops and float threads in a piece of fabric which comprises means to guide a piece of fabric in a predetermined plane, a severing head rotatable in a plane forming a slight angle to the plane of the fabric, said head having severing elements projecting substantially axially therefrom and engaging one face of the fabric adjacent the loops to be severed, and a second and similar severing head rotatable in a plane forming a reversed slight angle to the plane of said fabric and having axially extended severing elements engaging the opposite face of said fabric, the circular paths of movement of said two sets of severing elements

being slightly offset from each other in the direction of fabric travel.

11. Mechanism for severing selvage loops and float threads in a piece of fabric which comprises means to guide a piece of fabric in a predetermined plane, a pair of heads having severing elements engaging opposite faces of the fabric, and means to rotate said heads in the same direction with respect to the cloth, said heads being definitely and oppositely inclined from the plane of the fabric, and the axes of said heads being slightly offset from each other in the direction of fabric travel.

12. In a loop-severing mechanism, means to cause a piece of fabric to travel through said mechanism in a predetermined plane, a pair of severing heads each having a plurality of severing elements projecting axially therefrom, said head being mounted to effect engagement of said elements with both faces of a piece of fabric drawn therebetween, and each head being rotatable about an axis approximately perpendicular to the plane of fabric travel but displaced slightly therefrom in the direction of fabric travel.

13. In a loop-severing mechanism, means to cause a piece of fabric to travel through said mechanism in a predetermined plane, a pair of severing heads each having a plurality of severing elements projecting axially therefrom, said heads being mounted to effect engagement of said elements with both faces of a piece of fabric drawn therebetween, each head being rotatable about an axis approximately perpendicular to the plane of fabric travel and the axis of one head intersecting the plane of the fabric slightly in advance of the axis of the other head in the direction of fabric travel.

14. In a loop-severing mechanism, means to guide a piece of cloth through said mechanism in a predetermined plane, a severing head mounted to rotate about an axis somewhat inclined to the plane of the cloth, means to adjust said head axially toward and away from the plane of the cloth, and means to adjust said head transversely with respect to the selvage of said cloth.

15. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a pair of severing heads mounted to engage opposite faces of the fabric and to rotate about axes definitely and reversely inclined to the plane of the fabric, means to simultaneously adjust said heads transversely relative to the selvage of said fabric, and additional means to adjust one of said heads axially toward and away from the plane of the fabric.

16. In a loop-severing mechanism, a severing head comprising a disc having a plurality of axially extending recesses in its peripheral outer surface, and a plurality of forwardly curved severing elements secured in said recesses and projecting axially from said head substantially beyond the plane of said head, each entire severing element including its securing portion being disposed substantially in a single plane.

17. In a loop-severing mechanism, a severing head comprising a disc having a plurality of axially extending recesses in its peripheral outer surface, and a plurality of forwardly curved severing elements secured in said recesses and projecting axially from said head substantially beyond the plane of said head, each severing element having a non-cutting cloth-engaging end portion and having a severing portion on its inner curved edge, and each severing element including its securing portion being disposed substantially in a single plane.

18. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a severing head having a plurality of fabric-engaging and loop-severing elements, movable in a plane substantially parallel but slightly inclined to the plane of the fabric, means to rotate said head, and seam-controlled means to reverse the direction of rotation of said head while the seam is passing said head.

19. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a pair of severing heads each having a plurality of fabric-engaging and loop-severing elements, movable in a plane substantially parallel but slightly inclined to the plane of the fabric, said heads operating on opposite faces of said fabric in oppositely inclined planes, means to rotate said heads, and seam-controlled detector means effective to simultaneously reverse the direction of rotation of both heads while a seam is passing therebetween.

20. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a severing head having a plurality of fabric-engaging and loop-severing elements, movable in a plane substantially parallel but slightly inclined to the plane of the fabric, a reversible electric motor on which said head is mounted, and a seam-detecting device by which the direction of rotation of said head and severing elements is reversed while a seam passes said heads.

21. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a severing head having a plurality of fabric-engaging and loop-severing elements, movable in a plane substantially parallel but slightly inclined to the plane of the fabric, a reversible electric motor on which said head is mounted, and a seam-detecting device by which the direction of rotation of said head and severing elements is reversed while a seam passes said heads and by which the initial and normal direction of rotation is then automatically restored.

22. In a loop-severing mechanism, a severing head having a plurality of axially projecting severing elements, a shaft on which said head is mounted, means to rotate said shaft alternately in opposite directions, and means to move said head axially relative to said shaft when the direction of rotation is reversed.

23. In a loop-severing mechanism, a severing head having a plurality of axially projecting severing elements, a shaft on which said head is mounted, means to rotate said shaft alternately in opposite directions, and means to move said head axially relative to said shaft when the direction of rotation is reversed, said latter means comprising co-operating threaded portions on said head and shaft.

24. In a loop-severing mechanism, means to guide a piece of fabric through said mechanism in a predetermined plane, a plurality of severing heads operating on one face of a piece of fabric drawn past said heads and each comprising a plurality of loop-severing elements moving in a plane somewhat inclined to the plane of the fabric, and means to support said fabric by engagement with the opposite face thereof.

LELAND F. REMINGTON.