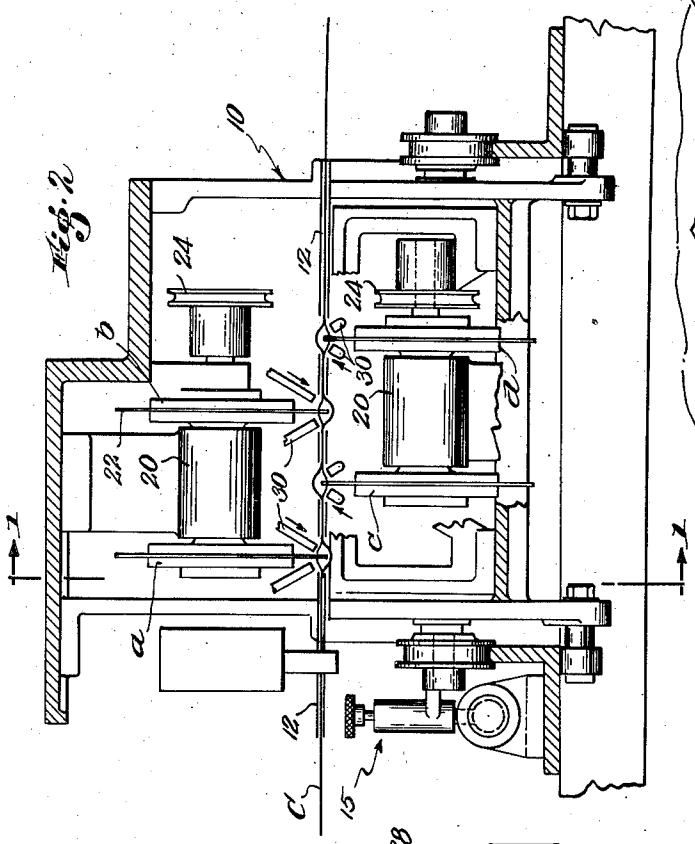
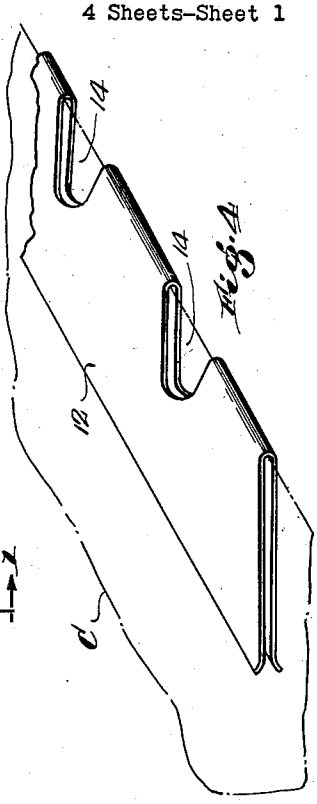
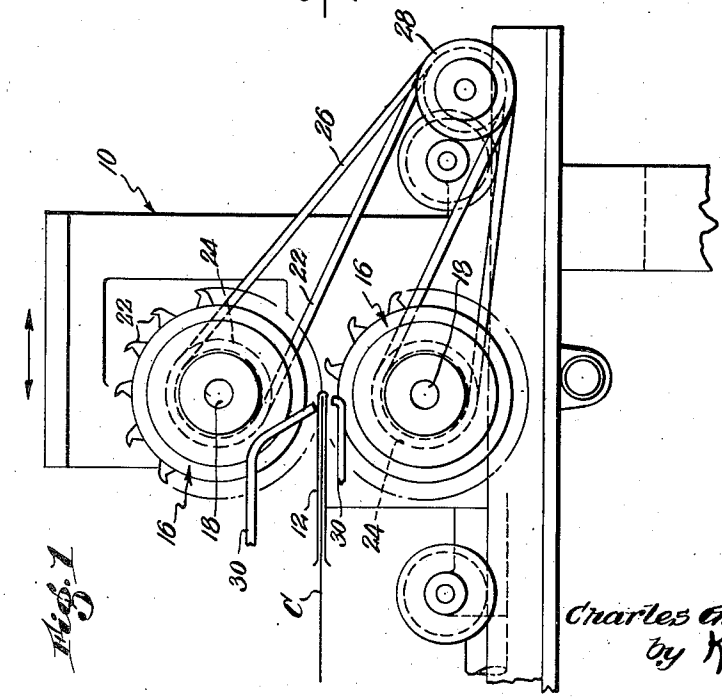
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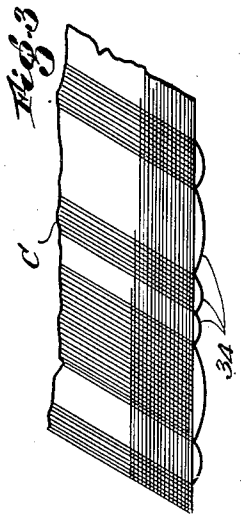
LOOP CUTTING MECHANISM

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LOOP CUTTING MECHANISM

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Fig. 6

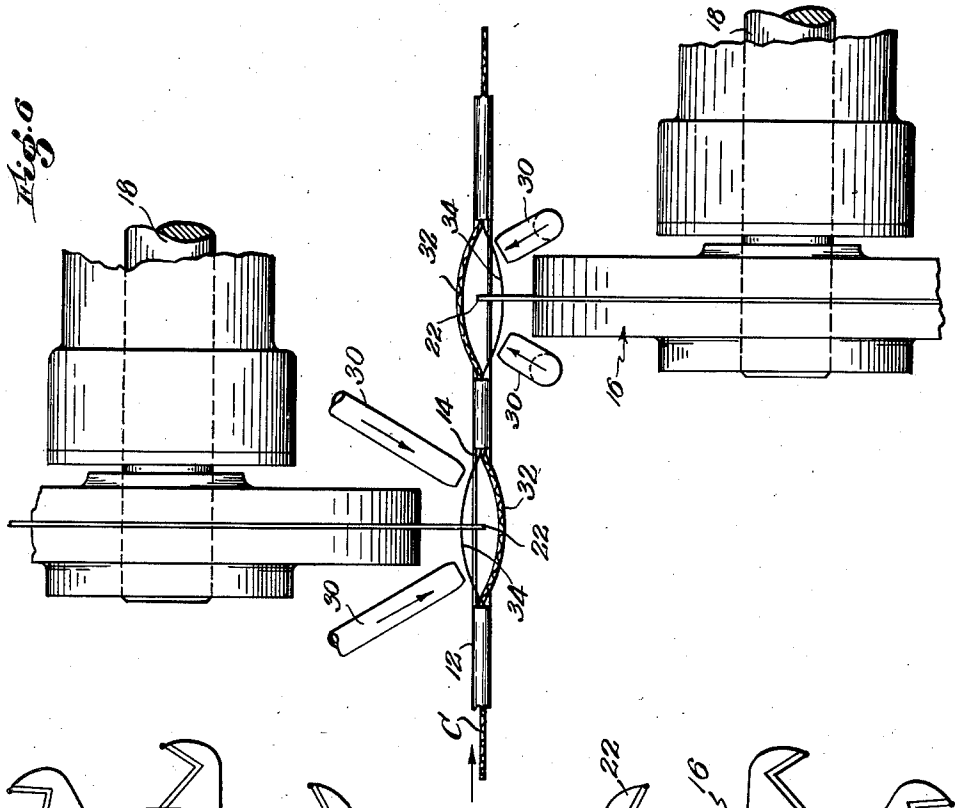
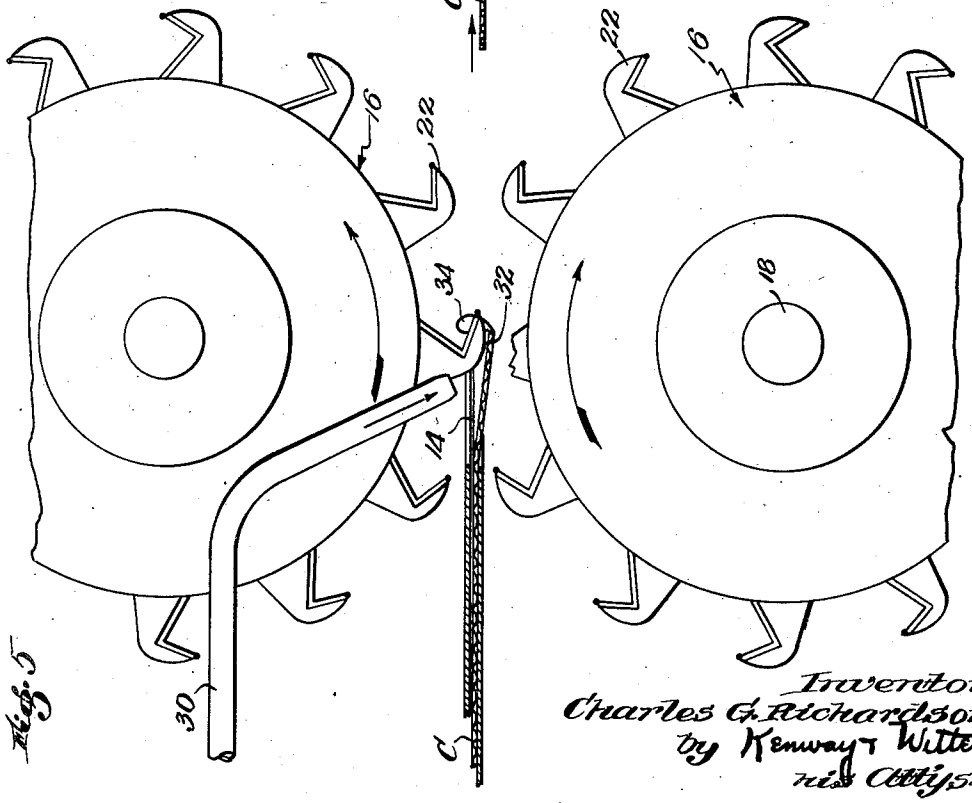


Fig. 5

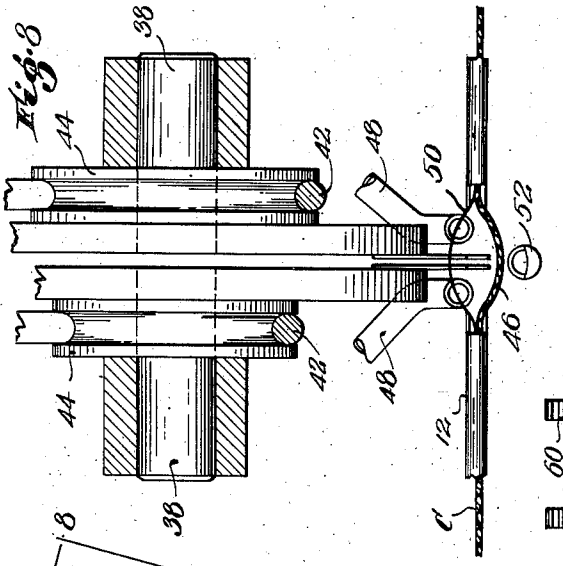


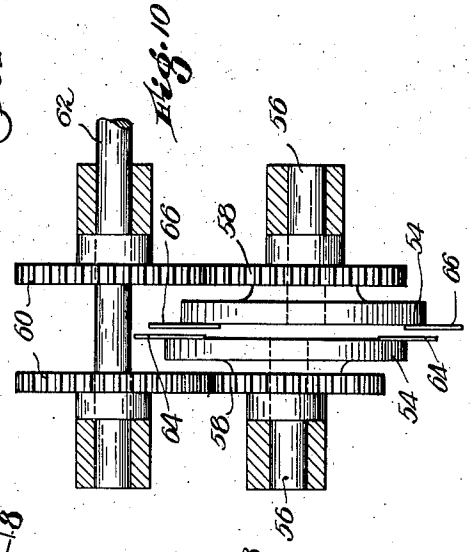
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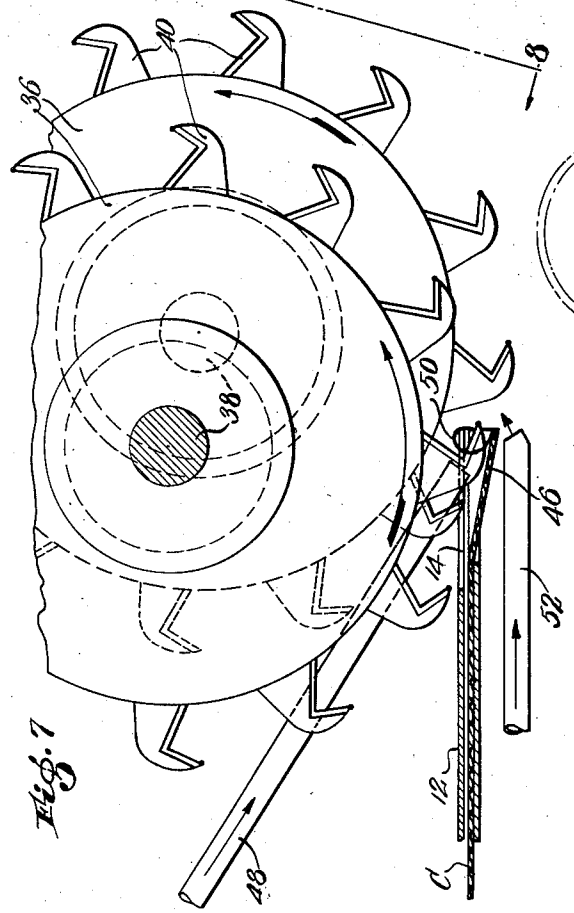
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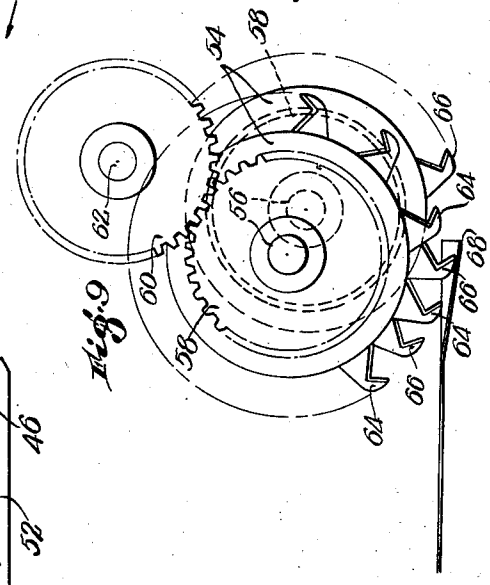
LOOP CUTTING MECHANISM

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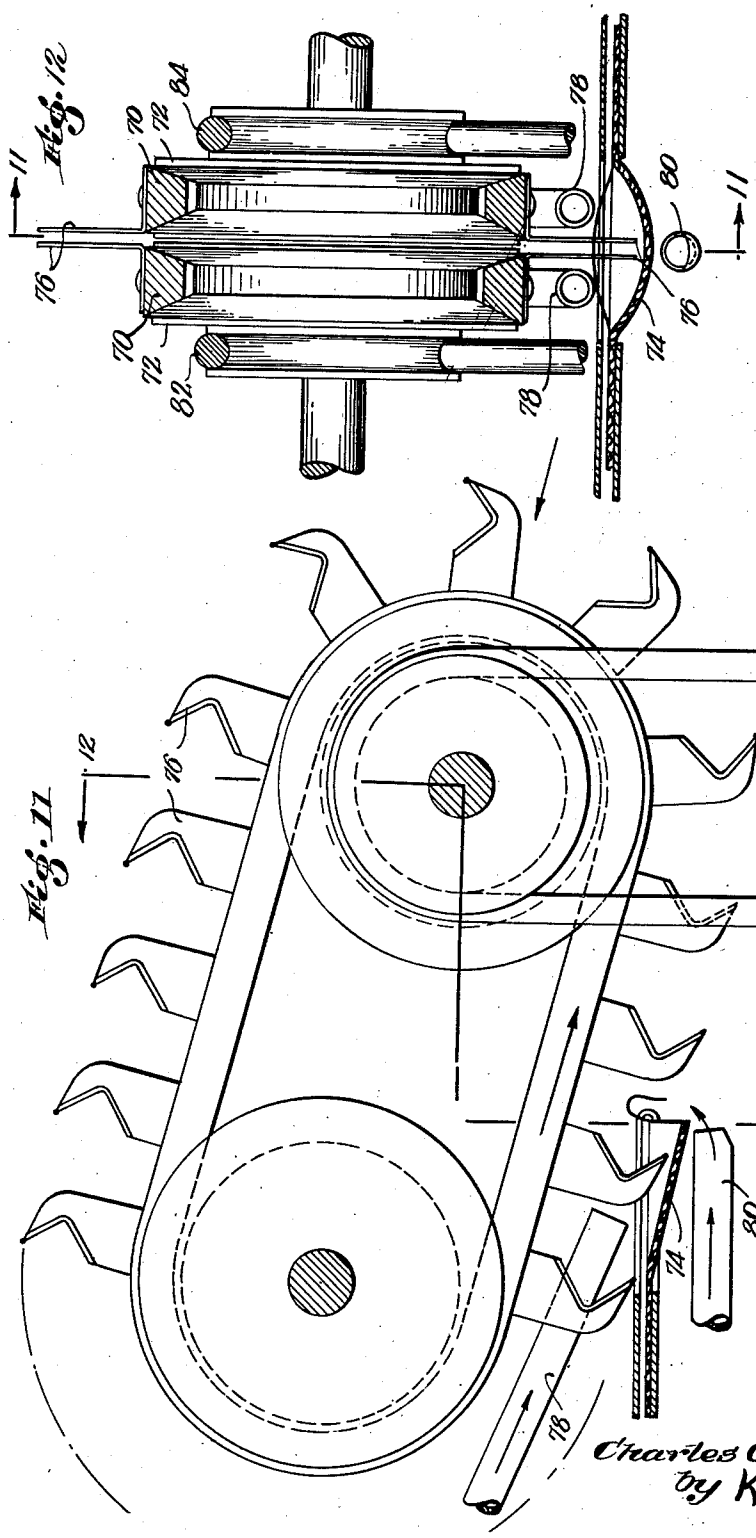


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LOOP CUTTING MECHANISM

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LOOP CUTTING MECHANISM

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Application May 11, 1946, Serial No. 669,167

9 Claims. (Cl. 26—11)

1

This invention relates to improved mechanism for cutting the loops or floating threads formed on the selvage edge of cloth in the weaving operation, in order to prepare the cloth for proper shearing of the edge. The primary object of the invention resides in the production of an improved machine which will very substantially speed up these loop cutting and shearing operations.

The invention contemplates means for feeding the cloth along a horizontal path and the employment of loop cutting units arranged alternately above and below the cloth and so associated with loop cutting salients at one or both marginal edges that the cloth can be fed and the loops cut at a speed very substantially in excess of that possible by machines heretofore known. This arrangement of a plurality of cutting units adapted successively to operate on the cloth results in greatly increased efficiency and production, all as hereinafter specifically described.

A further feature of the invention resides in an improved and novel loop cutting mechanism employing air jets to form the margin of the cloth into one or more salients, and simultaneously therewith cutting the loops at the salients by means of units having cutting knives arranged to pass through the salients transversely of the edge of the cloth as the units are operated, the preferred form of the invention employing air jets both above and below the cloth.

It will be apparent that speeding up the cloth feed requires a speeding up of the loop cutting operations and a novel and important feature of my invention comprises a new and improved loop cutting unit embodying a pair of juxtaposed elements carrying loop cutting knives arranged to pass through the salient. The arrangement not only provides more cutting knives at the salient but the elements are mounted to pass the knives along an extended path through the salient and in a staggered relation increasing the cutting efficiency. The elements may be mounted to rotate on parallel but non-coaxial axes or may comprise belt-like members as hereinafter described. The production of a new and improved loop cutter embodying any or all of these improvements comprises a further object of the invention.

These and other features of the invention will be best understood and appreciated from the following description of preferred embodiments thereof selected for purposes of illustration and shown in the accompanying drawings in which—

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Fig. 1 is a fragmentary side view of a loop cutter embodying my invention, taken on line 1—1 of Fig. 2,

Fig. 2 is a fragmentary front elevation,

Fig. 3 is a fragmentary marginal view of cloth to be treated,

Fig. 4 is a fragmentary perspective view of the cloth marginal guide,

Fig. 5 is an enlarged elevation of the cutters shown in Fig. 1,

Fig. 6 is an enlarged elevation of Fig. 2,

Fig. 7 is a fragmentary elevation of a modified loop cutting unit,

Fig. 8 is a front elevation thereof, taken along line 8—8 of Fig. 7,

Fig. 9 is a view like Fig. 7 but showing a further modification.

Fig. 10 is a front elevation thereof,

Fig. 11 is a fragmentary elevation of a further modified loop cutting unit, taken substantially on line 11—11 of Fig. 12, and

Fig. 12 is a sectional view taken substantially on line 12—12 of Fig. 11.

Referring first to Figs. 1–6 of the drawings, 10 indicates the frame of the machine carrying a rest for supporting the cloth C in a flat horizontal plane as it is passed through and treated at one or both marginal edges. A U-shaped guide 12 is provided for supporting the marginal edge of the cloth and a plurality of relatively spaced notches 14 are formed in the outer margin of the guide. The cloth is passed through the machine by well known feeding mechanism and known commercial mechanisms 15 are employed for "feeling" the marginal edge of the cloth and keeping it properly centered in the machine.

In the drawings I have illustrated the guide 12 as provided with four notches 14 and I not only provide a loop cutting unit at each notch but furthermore dispose the units alternately above and below the notches as illustrated in Fig. 2. The top and bottom units are identical, each comprising two wheels 16 fixed to a shaft 18 rotatably mounted in a bearing 20. Hooked loop cutting knives 22 are mounted in spaced relation on and about the periphery of the wheel 16 in position to pass outwardly through the adjacent notch as illustrated in Fig. 5. Sheaves 24 fixed to the shafts 18 are engaged and driven by a belt 26 from a driver 28, Fig. 1.

Cooperating with each notch 14 is a pair of converging air jet nozzles 30 located respectively at opposite sides of the element 16 and arranged to direct jets of air into the notch and outwardly of the marginal edge of the cloth therein.

These air jets form the marginal edge of the moving cloth into a salient 32 at each notch as the cloth feeds through the machine. The wheels 16 are set to pass the knives 22 outwardly through the notch and salient in position to catch and sever the loops 34. The free ends and peripheral margins of the hooked knives are blunt and rounded to prevent piercing or tearing of the cloth.

The loop cutting units at *a*, *b*, *c* and *d* (Fig. 2) are located alternately above and below the notches whereby the salients 32 are formed alternately in opposite directions as the cloth travels through the notches. The loops 34, being free from the cloth except at their ends, are blown in the opposite direction by the air blasts and are caught and severed by the knives. It will be apparent that the blowing of the salients alternately in opposite directions facilitates the loop cutting operation and certain loops that may be missed by the first cutters will be caught by succeeding cutters as the cloth and loops are air directed in the relatively opposite directions. The formation of the salient reduces the distance between the anchored ends of each loop and thus provides slack rendering the loop more responsive to the air jet. I have successfully operated this improved loop cutter at a cloth speed of 150 yards per minute, whereas other competing machines have heretofore operated only at speeds ranging from 15 to 50 yards per minute.

In Figs. 7 and 8 I have illustrated a modified construction in which each loop cutting unit employs a pair of knife carrying wheels 36 mounted in immediate juxtaposition for rotation on parallel but non-coaxial shafts 38. The axes of shafts 38 are disposed adjacent each other substantially perpendicular to the axis of the salient, as illustrated in Fig. 7, and loop cutting knives 40 are carried in spaced relation on and about the periphery of the wheels. The knives are disposed closely adjacent to each other near the center of the salient (Fig. 8) and it will be apparent that the offsetting of the shafts 38 provides an extended line of cutting knives in the salient substantially parallel with a line connecting the axes of the shafts 38. The two elements 36 are arranged for differential movement and separately driven by belts 42 on sheaves 44 and preferably at different speeds as by employing sheaves of different diameters. Such separate driving of the two elements multiplies the loop cutting action of the knives within the salient as will be apparent.

The salient 46 is formed in each notch by two air jet nozzles 48 disposed at opposite sides of the knives and the positioning of the loops 50 into cutting relation with the knives is facilitated by a third air jet nozzle 52 disposed below the notch and directed upwardly beyond the margin of the cloth, Fig. 7, thereby providing a blast of air for blowing the loops into the path of the knives.

In Figs. 9 and 10 I have illustrated a pair of loop cutting elements 54 mounted to rotate on shafts 56 arranged like the shafts 38. Two gears 58 of equal pitch respectively attached to the elements are in mesh with like gears 60 on a driving shaft 62. Loop cutting knives 64 and 66 on the two elements are disposed alternately and provide a substantially continuous series of cutting blades in the salient 68 substantially parallel with a line connecting the axes of the two shafts 56. The driving shaft and gears 60 and 58 serve to connect the elements for simultaneous and continuous rotation and fix the knives permanently in their alternate arrangement. It will be apparent that the arrangement provides maximum loop cutting action in the salient.

In Figs. 11 and 12 I have illustrated a pair of loop cutting belts 70 mounted in juxtaposed relation on sheaves 72. One reach of each belt is disposed along the salient 74, and loop cutting knives 76 are mounted in juxtaposed relation on the two belts and arranged to pass centrally through the salient formed by air jet nozzles 78, a third air jet nozzle 80 being provided for blowing the loops upwardly into the path of the blades. The two elements are driven separately and at different speeds by belts 82 and 84, thereby providing double loop cutting efficiency. It may in some cases be desirable to connect the belts and drive them at equal speeds with the knives on the two belts arranged alternately in the salient, as illustrated and described in connection with Figs. 9 and 10.

It will now be apparent that I have produced a superior and substantially improved loop cutting machine that will function at far greater speeds than like machines heretofore known. The employment of a plurality of loop cutting units arranged alternately above and below the cloth substantially facilitates the loop cutting operation at relatively high cloth feeding speeds and the employment of a plurality of cutting elements in juxtaposed relation greatly increases the number of cutting blades passing through the salient and thereby permits greatly increased cloth feeding speeds.

Having thus disclosed my invention, what I claim as new and desire to secure by Letters Patent is:

1. A selvage loop cutting machine comprising means for supporting a strip of cloth to be moved longitudinally along a predetermined path in a flat plane, means providing a guide for supporting a marginal edge of the cloth in said path, a notch in the marginal edge of the guide, means for directing an air jet upon the cloth in the notch to form a salient, a pair of loop cutting units in juxtaposed relation at the notch, each unit having a plurality of loop cutting knives disposed in spaced relation on and along a movable support in position successively to pass through the notch and the salient transversely of the marginal edge of the cloth, and means for diverting selvage loops of said marginal edge toward said units as the cloth passes the notch.

2. The machine defined in claim 1 in which the loop cutting units are mounted for differential movement, and separate driving means for the units.

3. A selvage loop cutting mechanism comprising means for supporting a strip of cloth to be moved longitudinally along a predetermined path, means providing a guide located to engage and support a marginal edge of the cloth in said path and past a loop cutting salient at one marginal edge of the path, a pair of knife carrying elements separately mounted in juxtaposed relation at the salient, a plurality of loop cutting knives in spaced relation on and along each element and in position to pass through the salient, and means for differentially driving the elements to pass the knives through the salient.

4. A selvage loop cutting mechanism comprising means for supporting a strip of cloth to be moved longitudinally along a predetermined path, means providing a guide for supporting a marginal edge of the cloth in said path and past a

loop cutting salient at one marginal edge of the path, two endless and relatively juxtaposed knife carrying belts each having one reach disposed along the salient, a plurality of loop cutting knives in spaced relation on and along each belt in position to pass through the salient, and means for driving the belts.

5. A selvage loop cutting machine comprising means for supporting a strip of cloth to be moved longitudinally along a predetermined path in a flat plane, means providing a guide for supporting a marginal edge of the cloth in said path, a notch in the marginal edge of the guide, a nozzle disposed to blow a jet of air transversely into the notch and form the marginal edge of the cloth therein into a salient, and a loop cutting unit associated with the notch and comprising a plurality of loop cutting knives disposed in spaced relation on and along the unit in position to pass through the concavity of the salient transversely of said edge as the unit is operated.

6. A selvage loop cutting machine comprising means for feeding cloth along a substantially straight path, a pair of air jet nozzles disposed in position to direct converging air blasts against one side of the margin of the cloth progressing along said path and thereby to form a salient in said margin, a third air jet nozzle disposed on the opposite side of said path in position to direct an air blast outwardly along the convex surface of said salient, and a plurality of cutters mounted to swing sequentially through the salient.

7. A loop cutting machine comprising means for guiding cloth along a substantially straight path, a pair of air jet nozzles disposed in position to direct converging air blasts against one surface of the margin of the cloth travelling along said path and thereby continuously deforming said margin to form a salient, a third nozzle disposed on the opposite side of said path in position to direct an air blast against the convex surface of the salient, a first wheel mounted to turn about an axis substantially parallel to the margin of the cloth, a first set of knives mounted radially on said wheel in position to pass sequentially through the concavity of the salient, a second wheel mounted to turn about an axis parallel to but offset from the axis of the first wheel, and a second set of knives mounted on the second wheel.

8. A loop cutting machine comprising means for guiding cloth along a substantially flat path, means for directing a continuous blast of air against the margin of said cloth to form a continuous salient therein, and two sets of radially disposed knives mounted to turn about parallel adjacent offset axes and to pass through the concavity of said salient.

9. A loop cutting machine comprising a pair of converging air jet nozzles, a third nozzle disposed in substantially opposed relation to said pair, and a series of cutting elements mounted to swing sequentially through an arc extending between the nozzles of said pair.

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