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Attys.
This invention relates to cloth-splitting attachments which are adapted to be fixed to a loom at a point forward of the fell to split the cloth into a plurality of strips as it advances during the weaving operation.

This device may be used for various purposes but is chiefly adapted to dividing a woven fabric into a plurality of strips during the weaving operation. As many such attachments may be used as is desired depending upon the number of strips into which it is desired to divide the cloth. In a device of this character it is essential that the cutting operation be accomplished in a manner to prevent all possible distortion and excessive strain upon the cloth and at the same time produce an accurate and positive cut.

It is the object of this invention to provide a splitting device which will function in such a desired manner.

A further object of the invention is to provide a device which is automatic and simple in structure and which will function for a long period of time without attention.

A further object of the invention is to provide a cutting device having a rotary disk cutter driven by the motion of the lay.

A further object of the invention is to provide a cloth-splitting device, the elements of which are adjustable with relation to the loom and to the plane of the cloth.

The object of the invention is further to provide a device of the character indicated which includes a circular oscillating disk cutter having means actuated from a moving part of the loom to rotate the cutter in one direction and automatic means to rotate the cutter in the opposite direction.

Other objects and features will more fully appear from the following description in connection with the accompanying drawings and will be particularly pointed out in the claims.

Since the device may be applied to any type of loom the construction of which is familiar to those skilled in the art it is necessary to describe only those elements thereof which are directly associated with and which cause the cutter to function.

In the drawings:

Fig. 1 is a cross section through a portion of a loom showing the splitting device in position thereon;

Fig. 2 is a horizontal section on the line 2—2, Fig. 1 showing the center or intermediate selvage;

Fig. 3 is an elevation of the device looking from the front as installed on the loom;

Fig. 4 is a vertical sectional view on the line 4—4, Fig. 1.

It becomes necessary at times to supply demand for goods which are relatively narrow. The required width may be less than that which can be woven on looms which are available. Furthermore, a saving in cost may be the deciding factor. Since a narrow loom is relatively uneconomical to operate it becomes desirable to provide other means to produce the required narrow width. Since economy is an important factor the means employed must be low in cost and must operate without attention at a minimum of expense.

By the use of a cloth-splitting attachment such as herein disclosed a loom of medium width may be employed and the product therefrom be cut into strips of any desired width. The device may be supported from any convenient rigid part of the loom where it will sever the cloth at a point between the fall and take-up rolls. One convenient point of support is the breast beam 1 which is rigidly supported from the loom sides and extends across the loom at a convenient location to receive the splitting devices. A bracket 2 is bolted or secured in any desirable way to the breast beam as by the bolt 3. The bracket 2 may have a slot 4 therein to receive the bolt 3, said slot providing a means to position the free end 5 of the bracket in a horizontal plane.

The device itself comprises a frame 6 disposed substantially in a vertical plane and having a horizontal extension 7 adapted to underlie the bracket 2. The extension 7 is adjustably secured to the bracket 2 by means of the bolt 8. Since the cutting must take place at a definite predetermined point a lateral adjustment is, therefore, provided at the point of connection between the bracket and the extension 7.
A lateral slot 9 is provided in the bracket 2 through which the shank of the bolt 8 passes. A lateral groove 10 is provided therein to receive a projection 11 on the extension 7. By loosening the bolt 8 the frame 6 may be shifted laterally and clamped in place by the bolt 8. The frame 6 has adjustably secured thereto an arm 12 which receives a stud shaft 13 upon which is pivoted a cutter 14. The arm 12 is provided with a vertical slot 16 to receive the shank of a bolt 17 which passes through the frame 6. The position of the cutter 14 may thus be adjusted to its proper relation with respect to the plane of the cloth 13.

A cloth support or guide 18 has a horizontal portion 19 extending below the cloth and secured to the lower portion of the frame 6 by means of a bolt 21. In order to provide for vertical adjustment of the guide 18 a slot 22 is provided therein through which the bolt passes thereby permitting the vertical movement of the guide 18 upon loosening the bolt. After accurately setting the guide it is held rigid by clamping tightly with the bolt 21.

The cutter 14 is circular and preferably made of thin sheet material hardened and ground to a sharp cutting edge at its periphery.

The cutter is mounted on a bushing 23 of any suitable material. As herein shown it is of hard wood having two cylindrical portions of different diameter forming a shoulder 24 therebetween. The smaller portion 25 is of the same size as the central aperture 26 in the cutter. The cutter is slipped over the portion 25 until it engages the shoulder 24. A metal sleeve 27 is then forced over the portion 25 until it bears against the cutter thus clamping it firmly against the shoulder.

The bushing 23 rotates freely upon the stud shaft 13 which is threaded through the end of the arm 12 and secured by the lock nut 28. A coil spring 29 is also mounted on the sleeve to rotate the cutter in opposition to the action of a driving strap 30, the action of which will be described hereinafter. One end of the spring 29 is inserted in an aperture 31 in the arm 12. The other end of the spring is passed through an aperture in the cutter and extended into an aperture in the sleeve 27. In this manner the bushing with its cutter is positively connected to the spring and driven thereby when the latter is under tension. Any other convenient means may be employed to rotateably mount the cutter on the stud shaft without departing from the invention.

At the upper end of the frame 6 a horizontal portion 32 projects rearwardly and has a cylindrical boss 33 at its end which is drilled centrally to receive a plunger 34 disposed horizontally and in the path of the hand rail 35 of the lay. At the junction of the vertical portion of the frame 6 and the horizontal portion 32 thereof the frame 6 is divided into two sections 36 having a central space 37 therebetween in which the end of the plunger moves.

The strap 30 is wound about the metal sleeve 27 for substantially its full peripheral area and secured at its end thereto by means of a screw 38. The strap 30 which may be of any suitable flexible material, such as rawhide, extends upwardly and is secured to the forward end of the plunger by means of the screw 39.

A guide roll 40 is pivoted between the sections 36 of the frame upon a stud 41. The roll 40 functions to guide the strap 30 into proper relation with the sleeve 27 as the plunger is actuated by the lay. The spring 29 is adjusted to maintain a slight tension in the strap 30 at all times which tends to move the plunger rearwardly so that its normal position is determined by the stop pin 42 which bears against the boss 33.

The device is so positioned that the plunger is actuated by the extreme forward motion of the lay and the amount of such movement may be adjusted by means of the adjustment at the rear end of the plunger. A screw 43 is threaded into the end of the plunger and is provided with a lock nut 44 which serves to lock the adjustment when the proper amount of motion has been determined.

Upon each beat up of the lay the plunger is moved forwardly and such motion is transmitted through the strap 30 to rotate the cutter and at the same time wind up the spring 29. As the lay moves away from the plunger the spring 29 will act to rotate the cutter in the opposite direction, thus causing the plunger to be returned to its normal position with the pin 42 against its stop. The oscillating action of the cutter ensures a very positive cutting action and precludes all possibility that the cloth may pass the cutter without being severed.

The function of the guide or support 18 is to maintain the cloth at the predetermined cutting point preferably in the normal plane of the cloth. The cloth is thereby cut accurately, smoothly and at the same time is free from all unnecessary strain. The cutter may be used in connection with any type of cloth but is especially adapted to splitting goods which has been specially prepared having a central or intermediate selvage such as that illustrated in Fig. 2. At the point of division there are two relatively dense selvage portions 45 having a central portion 46 in which the warps have been omitted. The resulting strips of cloth are thereby provided with finished edges similar to cloth produced in the usual manner.

There is thus presented a simple and efficient splitting attachment in which the cutter is of the rotary type and in which the
cutting action is positive and certain and independent of the movement of the cloth.

In order to insure protection of the operator from injury a guard is provided for preventing contact with the cutter. This guard desirably is in the form of a plate having a cylindrically curved portion 47 which surrounds a portion of the cutter and merges into a vertical shank portion 48 which at its upper end has a laterally extending flange 49 provided with a horizontal slot 50 and which is adjustably secured upon the arm 12 by the bolt 17 which secures the arm 12 to the frame 6.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A cloth splitting attachment for looms comprising a rotary disk cutter, means to support said cutter from the loom frame with its axis in fixed position above the cloth and with its cutting edge intermediate the edges of the cloth and in position to cut lengthwise and in the plane thereof, a support beneath the cloth adjacent the cutter acting to maintain the cloth in the cutting plane and means actuated by the lay to rotate the cutter to sever the cloth as it moves forward during the weaving operation.

2. A cloth splitting attachment for looms comprising an oscillating circular disk cutter, means to support the cutter from the loom frame with its axis in fixed position above the cloth and with its cutting edge intermediate the edges of the cloth and in position to cut lengthwise and in the plane thereof, a support beneath the cloth adjacent to the cutter acting to maintain the cloth in the cutting plane, and means actuated by the lay to oscillate the cutter to sever the cloth as it is moved forward by the weaving operation.

3. A cloth splitting attachment for looms comprising a frame, a driven circular disk cutter mounted thereon, means to support said frame rigidly on the loom with the cutter intermediate the edges of the cloth and in position to cut lengthwise and in the plane of the cloth, a guide or support secured to the frame adjacent the cutter to maintain the cloth in the cutting plane, a plunger mounted on the frame and projecting in the path of the lay and receiving motion therefrom and means connecting the plunger and the cutter acting to drive the cutter upon the movement of the plunger.

4. A cloth splitting attachment for looms comprising a frame, a circular disk cutter rotatably mounted thereon, an adjustable bracket to support the frame rigidly on the loom with the cutter intermediate the edges of the cloth and in position to cut lengthwise and in the plane of the cloth, a support or guide adjustably mounted on the frame extending below the cloth and acting to maintain the cloth in the cutting plane, a plunger mounted in the frame and projecting in the path of the lay and receiving motion therefrom and means connecting the plunger and the cutter acting to cause said motion to rotate said cutter.

5. A cloth splitting attachment for looms comprising a frame, an oscillating circular disk cutter rotatably mounted thereon, an adjustable bracket adapted to support the cutter above the cloth intermediate the edges thereof to cut lengthwise and in the plane thereof, a support on said frame extending beneath the cloth adjacent to the cutter adapted to maintain the cloth in the cutting plane, a plunger mounted in the frame and projecting in the path of the lay, a roll on the axis of said cutter and fixed thereto, a flexible strap connected at one end to said plunger and wrapped around said roll at its other end, whereby motion transmitted to the plunger will rotate the cutter to sever the cloth as it is moved forward by the weaving operation.

6. A cloth splitting attachment for looms comprising a frame, a driven circular disk cutter mounted thereon, means to support said frame rigidly on the loom with the cutter intermediate the edges of the cloth in position to cut lengthwise and in the plane of the cloth, a plunger mounted on the frame and projecting in the path of the lay and receiving motion therefrom and means connecting said plunger and cutter acting to drive the cutter upon the movement of the plunger.

7. A cloth splitting attachment for looms comprising the construction defined in claim 6, together with means acting automatically to drive the cutter in the opposite direction upon the retraction of the lay.

8. A cloth splitting attachment for looms comprising a frame, an oscillating circular disk cutter rotatably mounted thereon, a plunger mounted in the frame and projecting in the path of the lay, a roll on the axis of said cutter and fixed thereto, a flexible strap connected at one end to said plunger and wrapped around said roll at its other end, whereby motion transmitted to the plunger will rotate the cutter to sever the cloth as it is moved forward by the weaving operation.

9. A cloth splitting attachment for looms comprising the construction defined in claim 8, together with a spring connected to the cutter and the frame, placed under tension by the lay induced movement of the plunger and acting when the lay retracts to rotate the cutter in the opposite direction.

In testimony whereof, I have signed my name to this specification.

HARRY A. DAVIS.