United States Patent

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[54] **CUTTER METHOD AND APPARATUS**
7 Claims, 3 Drawing Figs.

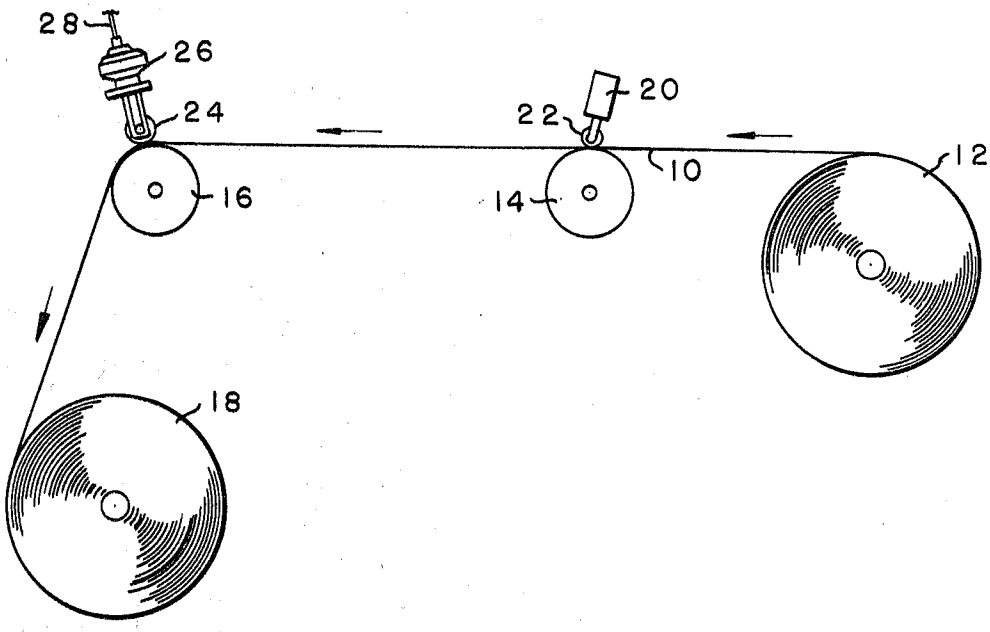
[52] **U.S. Cl.** **83/56,** 83/360, 83/506
[51] **Int. Cl.** **B23d 19/04**
[50] **Field of Search** 83/56, 360, 362, 368, 371, 505, 506

[56] **References Cited**
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ABSTRACT: This invention is directed to a method and apparatus to automatically increase the pressure on the cutting blade of a score cutter upon the detection of an area of increased thickness in the material approaching the cutter to be cut.



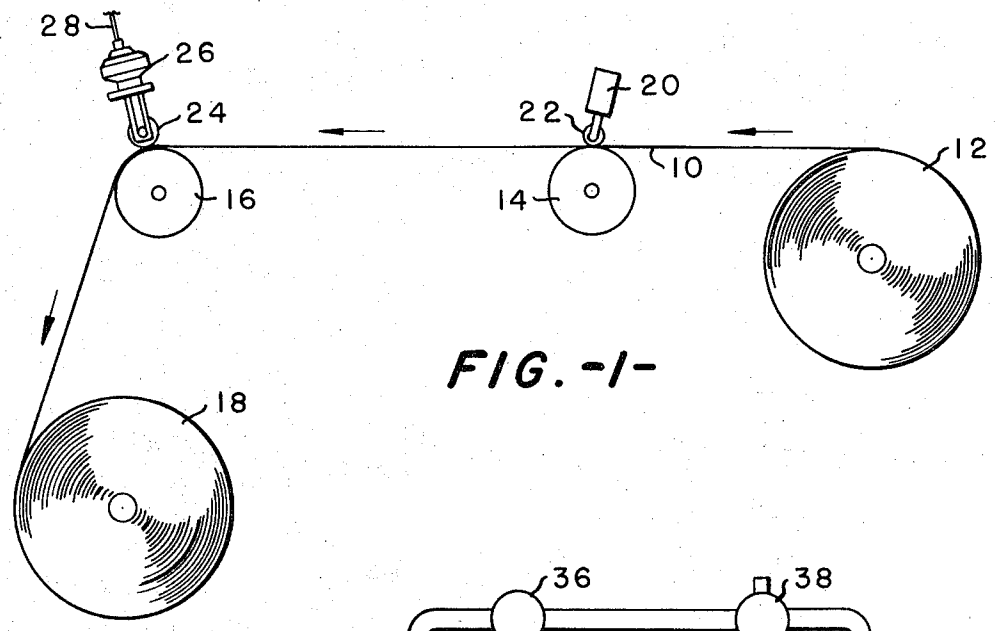


FIG.-1-

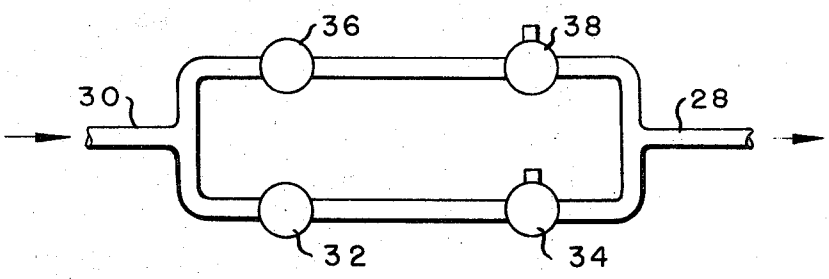


FIG.-2-

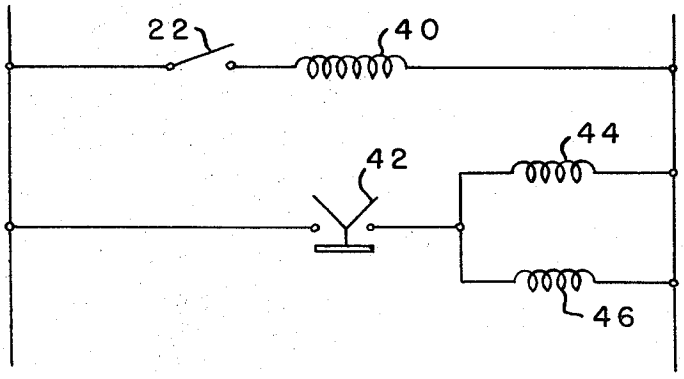


FIG.-3-

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CUTTER METHOD AND APPARATUS

In many operations wherein running lengths of sheet material have to be severed longitudinally, a score cutter is used to perform this operation. As is well known in the art, the term "score cutter" refers to a rotary cutting blade which is held against a hardened surface to sever the material therebetween. The use of such a cutter present problems when cutting sheet material, in which, periodically, thickened portions appear in the material being cut. This is especially true in the textile industry wherein a number of pieces of fabric are sewn together and periodically the seams, which are thicker than the fabric, have to be cut. Prior to this invention this problem was partially solved by placing the score cutter under a constant high pressure which was sufficient to cut the seams. This results in excessive wear on the cutting blade as well as excessive wear on the hardened backup surface and excessive down time of the apparatus to replace the blades.

It is therefore an object of this invention to provide a method and apparatus to score cut a moving sheet of material without excessive wear on the cutter.

A further object of the invention is to provide a method and apparatus to score cut a moving web of fabric which will cut the seams therein.

Other objects and advantages of the invention will become readily apparent as the specification proceeds to describe the invention with reference to the drawings, in which:

FIG. 1 is a schematic representation of the score cutting system;

FIG. 2 is a schematic representation of the valve arrangement; and

FIG. 3 is a partial circuit diagram.

As discussed briefly, it is desired many times to slit a running sheet of fabric in the longitudinal direction of the fabric. Examples of such instances would be to remove the untucked selvage on a fabric from a high-speed loom or to split a woven double width fabric to provide two widths of fabric. In normal operation a number of pieces of fabric will be sewn together to form a roll of fabric. When the pieces of fabric are we sewn together there will be an area of increased thickness which requires more cutting pressure. To solve this situation an arrangement like that shown in FIG. 1 is employed where the fabric **10** to be severed is supplied from a supply roll **12**, over an idler **14**, over a driven hardened roll **16** to the takeup roll **18**. Cooperating with the idler roll **14** is a seam detector **20** which has a roller microswitch **22** adjacent the moving web of fabric **10**. The roller microswitch is located just above the fabric and is actuated upon contact with an area of increased thickness in the fabric.

Cooperating and held in contact with the fabric **10** against the hardened steel roll **16** is a score cutting blade **24**, preferably of the pinking type, to sever the fabric as it passes from the supply roll **12** to the takeup roll **18**. To provide cutting pressure air under pressure is introduced into piston **26** through air line **28** to maintain the cutting blade against the hardened steel roll **16**.

OPERATION

Looking now to FIGS. 2 and 3, the operation will be explained. Under normal operation at a predetermined pressure, air is supplied through air conduits **30**, pressure-reducing valve **32**, normally open solenoid-actuated air valve **34** into the air cylinder **26** through the air conduit **28**. The air pressure in line **30** is greater than that required to cut through an area of increased thickness. Pressure-reducing valve **32** is so selected to provide a pressure in conduit **28** that will provide efficient cutting of the fabric but is lower than the air pressure supplied through pressure-reducing valve **36**. Solenoid operated air valve **38** is a normally closed valve.

When a seam passes under the roller microswitch **22** the switch will close energizing the relay coil **40** pulling in time delay switch **42**. Closing of time delay switch **42** energizes both solenoid coils **44** and **46** to reverse the position of air valves **38** and **34**, thereby supplying higher pressure air to the conduit **28** from air conduit **30**, pressure reducing valve **36** and air valve **38**. Since air valve **34** is a normally open valve, energization of the solenoid will close the valve and stop the flow of air through **34**.

As pointed out, switch **42** is a time delay switch that allows sufficient time for the detected seam to pass under and be cut by the cutting blade **24** before it opens to deenergize the solenoid coils **44** and **46** to allow the air valves **34** and **38** to reverse position to supply lower pressure air to the air cylinder **26**.

It can readily be seen that I have provided a system for cutting fabric which provides only the pressure necessary to cut the fabric and at the same time provides additional pressure upon detection of a thick place in the fabric to efficiently sever this area of increased thickness. Further, the resultant product is a better grade due to the more efficient cutting thereof.

Although I have described specifically the preferred embodiment of my invention, I contemplate that changes may be made without departing from the scope or spirit of my invention and I desire to be limited only by the scope of the claims

I claim:

1. A method of score cutting a running sheet of material comprising the steps of: providing a running length of material, applying a predetermined pressure on a score cutter to score cut the running length of material in the longitudinal direction thereof, sensing an area of increased thickness in said running length of material and momentarily increasing the pressure on said score cutter to cut the area of increased thickness.

2. The method of claim 1 wherein air pressure is applied to said score cutter.

3. Apparatus to score cut a running length of material comprising: means supplying a running length of material, score cutting means operably associated with the running length of material, means to detect an area of increased thickness in the running length of material, means to apply a predetermined pressure to said score cutting means and means to momentarily increase the pressure on said score cutting means upon the detection of an area of increased thickness in the running length of material.

4. The structure of claim 3 wherein said means to detect an area of increased thickness is a seam detector.

5. The structure of claim 4 wherein said seam detector. includes a roller microswitch adapted to contact the running length of material.

6. The structure of claim 3 wherein said means to apply pressure to said score cutting means is an air cylinder.

7. The structure of claim 6 wherein said means to apply pressure includes a pneumatic control circuit.