H. L. SCOTT.

PROCESS OF TESTING TEXTILES.

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1,184,035.

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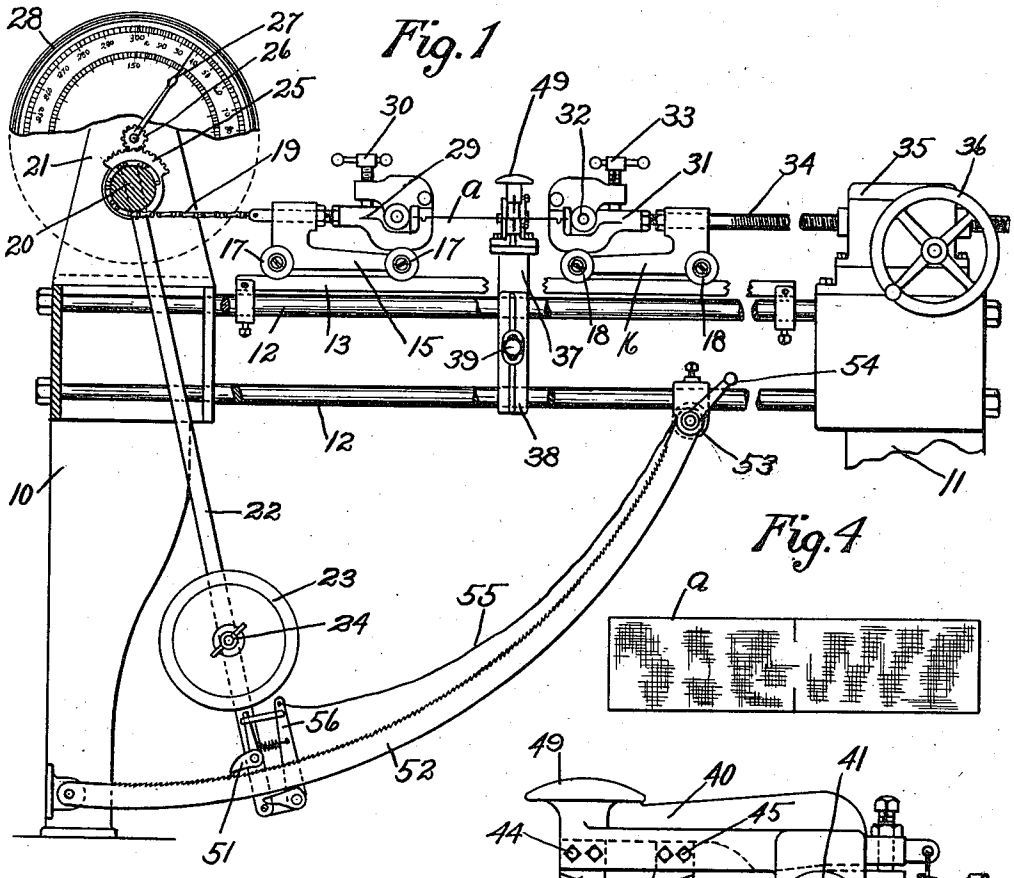


Fig. 1

Fig. 4

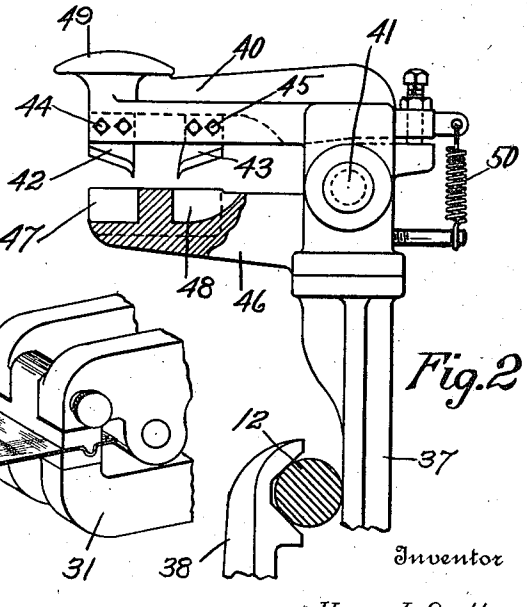


Fig. 2

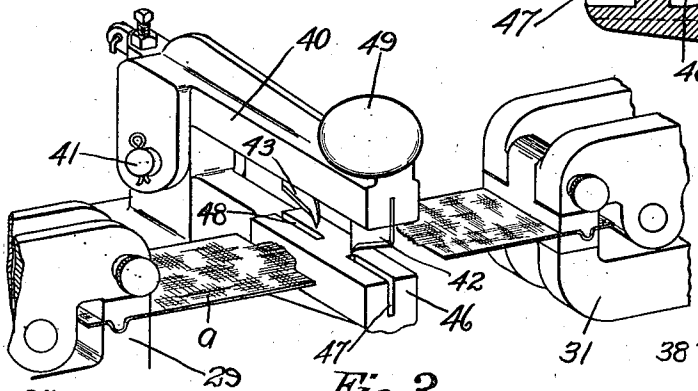


Fig. 3

Witnesses

W. W. Bardsley.

R. F. Macready.

Inventor

Henry L. Scott.

By

Howard E. Barlow

Attorney

UNITED STATES PATENT OFFICE.

HENRY L. SCOTT, OF PROVIDENCE, RHODE ISLAND.

PROCESS OF TESTING TEXTILES.

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To all whom it may concern:

Be it known that I, HENRY L. SCOTT, a citizen of the United States, and resident of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Processes of Testing Textiles, of which the following is a specification.

This invention relates to an improved method or process of testing the tensile strength of fabric or other material which consists in placing a strip of the material to be tested under tension, then cutting the opposite edges of the same, reducing the effective load resisting portion to a predetermined dimension, and then continue to increase the strain until rupture takes place, an exhibitor being connected to the testing apparatus so that the exact breaking strain may be readily ascertained.

In the accompanying drawings: Figure 1— is a side elevation partly in section showing one form of testing machine to which my improved device is shown as being attached. Fig. 2— is a side elevation partly in section showing one form of severing device and a portion of the means whereby it may be attached to the tension applying machine. Fig. 3— is a perspective view showing the gripping jaws engaging opposite ends of the narrow strip of fabric and representing a strip as having been pulled apart also showing the severing device in position to operate upon a strip held between the jaws. Fig. 4— represents a strip of material with its opposite edges cut inward a predetermined depth.

The usual method of testing woven fabrics such as cloth, canvas and the like, is to strip the material into narrow widths, usually about one inch wide and then apply a strain to the strip sufficient to pull the fabric apart, but it is found that such a test is quite unsatisfactory, particularly with the heavier fabrics such as canvas duck or the like, for the reason that in weaving, the warp threads are passed alternately over and under the weft threads and are thus formed in a wavy or sinuous line which naturally takes up considerable of their length and when such a fabric is placed under tension the first two or three threads at the opposite edges of the strip which are practically released by the severed filling threads, straighten out, and thus fail to support their proportion of the load, and therefore by this means a fair test of the strength of the one inch of fabric cannot possibly be obtained. To obviate this difficulty, I have provided a simple method whereby a strip of material is employed which is about twice the width of that desired for the actual breaking test. To this I apply a predetermined tension and then cut or otherwise sever and reduce the cross section of the material to a predetermined dimension, preferably by cutting the warp threads at the opposite edges, and then continue the application of the power until the strip is broken, the breaking strain being indicated on a graduated dial. By this means the weft threads are firmly held by the ends of the interwoven warp threads from raveling or straightening, thus the uncut warp threads of the full remaining inch will hold their original woven shape, and so take their full share of the load permitting an accurate test to be obtained of the fabric.

In the drawings I have illustrated one form of tension applying mechanism in which—

10 and 11 designate the opposite supports which are connected together by means of a plurality of tie rods 12, on the upper pair of which are supported longitudinal rails 13 on which roll the two carriages 15 and 16 on their respective wheels 17 and 18. The carriage 15 is connected by a chain 19 to the hub 20 which is mounted on suitable antifriction bearings in the head 21. To this hub is secured a pair of pendulum arms 22 and to the lower portions of these arms is secured an adjustable weight 23 by the screw 24. A gear segment 25 is also connected to this hub 20 to engage with the pinion 26 and so operate the pointer 27 to indicate in pounds or other unit of measure on a fixed graduated dial 28 the amount of tension which is being exerted on the material through the chain 19. On this carriage 15 is mounted a gripping jaw 29 which may be operated by the hand screw 30 and a duplicate jaw 31 is connected to the carriage 16, its loose jaw being pivoted at 32 and operated by the hand screw 33. To the carriage 16 is connected a long tension screw 34 which passes through the head 3 in which is mounted suitable mechanism (not shown) whereby the rotating of the hand wheel 36 causes a longitudinal movement of said tension screw.

The feature of my present invention is

the method or process of subjecting a strip of fabric to a strain by a testing machine or other suitable device and while under this strain to have the yarn or threads at the opposite edges of the strip cut or severed for a given distance inward by hand or otherwise, whereby the cross section of the material is reduced to a predetermined dimension. I have shown one form of mechanism which may be employed in cutting the edges of the fabric mechanically which comprises a standard portion 37 adapted to be clamped by means of a screw 39 through the front bar 38 to the tie rods 12 and on this standard I have pivoted at 41 a cutter arm 40. This arm 40 is provided with a pair of blades 42 and 43 which are fastened thereto by screws 44 and 45 and in order to provide a suitable support for the material while being cut, I have provided a rest arm 46 which is slotted at 47 and 48 to receive the blades 42 and 43 when the cutter arm descends to force these blades through opposite edges of the material.

The following describes the operation of one form of mechanism employed in the carrying out of my improved method or process of obtaining the tensile strength of the material: The opposite ends of the material *a* to be tested are firmly gripped in the jaws 29 and 31 which are mounted on their respective carriages 15 and 16. At the beginning of the test the weight 23 hangs vertically and the pointer 27 indicates zero. The strain is applied to the material by rotating the hand wheel 36 thereby moving both carriages to the right and swinging the weight from its vertical position and when the pointer indicates a predetermined amount the hand of the operator strikes the handle 49 of the knife arm and the blades 42 and 43 are forced down through the material severing the edges of the same inward a predetermined distance. These blades are immediately returned by the spring 50 and the process is continued until the material breaks at which time the position of the pointer is accurately noted thus indicating the exact tension in pounds or other unit of measure at which the material was severed. The pendulum arm 22 is provided with a pawl 51 which contacts with the notched surface of the segment bar 52 so that this weight and the pointer are caused to remain in their advanced position until such time that it is desired to return them to normal which may be accomplished by a small reel 53 operated by the handle 54 to wind up the cord 55 and apply sufficient tension on the arm 56 to release the pawl 51 and then lower the weight back to normal.

I have described the testing strain on the fabric as being applied in the direction of its warp threads but the same test may be made equally as well in the direction of the weft threads if desired.

I claim:

1. The improved method of testing the tensile strength of material consisting in tensioning the material, reducing the material while under tension to a predetermined dimension by incisions, and increasing the strain until the material is broken.

2. The improved method of testing the tensile strength of a strip of material consisting in tensioning the material, cutting each edge of the material transversely while under tension, so as to reduce the strip to a predetermined testing width, and increasing the strain until this portion of the material is broken.

3. The improved method of testing the tensile strength of a strip of fabric consisting in forming the strip to a width greater than that to receive the actual test, placing the same under tension, cutting its opposite edges simultaneously and transversely to reduce the fabric to a predetermined testing width, and increasing the strain to the desired amount.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY L. SCOTT.

Witnesses:

HOWARD E. BARLOW.

A. F. MACREADY.