Aug. 16, 1949. L. BOOR ET AL 2,479,303

CREASE RESISTANCE TESTING

Original Filed Jan. 16, 1945

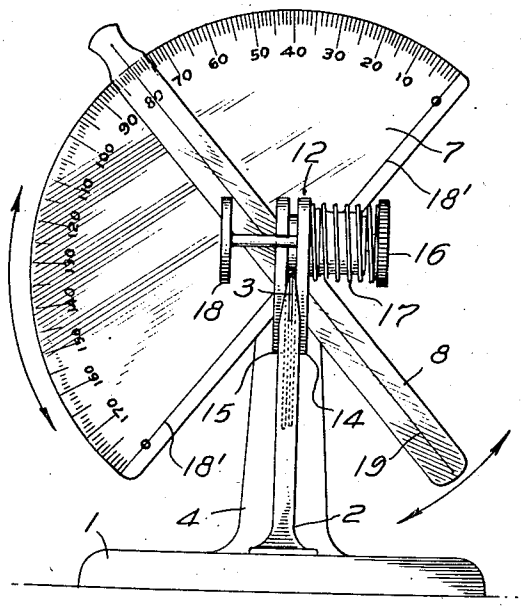


Fig. 1.

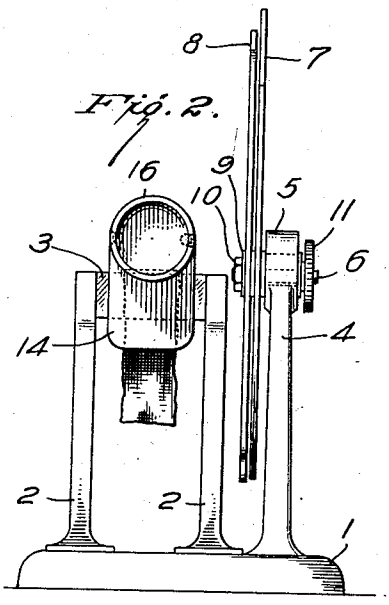


Fig. 2.

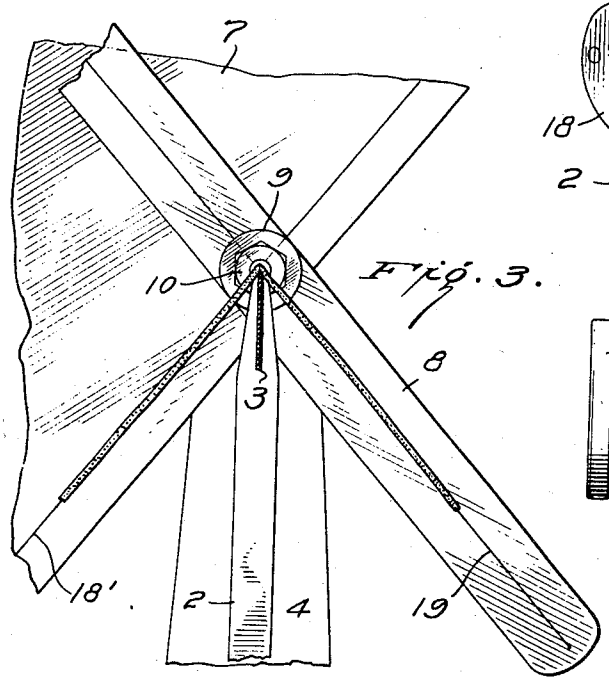


Fig. 3.

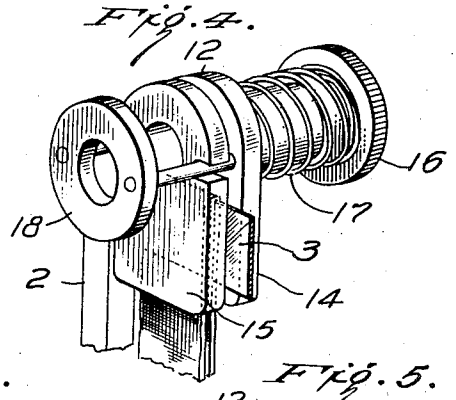


Fig. 4.

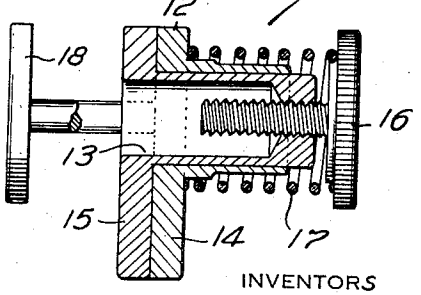


Fig. 5.

INVENTORS
LADISLAV BOOR,
LINTON A. FLUCK,
BY
Ellis S. Middleton
ATTORNEY

Patented Aug. 16, 1949 2,479,303

UNITED STATES PATENT OFFICE

2,479,303

CREASE RESISTANCE TESTING

Ladislav Boor, Bethesda, Md., and Linton A. Fluck, Pluckemin, N. J., assignors to American Cyanamid Company, New York, N. Y., a corporation of Maine

Continuation of application Serial No. 573,060, January 16, 1945. This application September 2, 1948, Serial No. 47,448

3 Claims. (Cl. 73—100)

1

The present invention relates to a method and apparatus for determining crease resistance of sheet material, and particularly that of textile fabrics.

The principal object of the invention is to provide a method and apparatus for accomplishing the above which will guarantee more uniform results than any method or apparatus used heretofore. Another important object of the invention is to provide an apparatus for the above purpose which will facilitate tests of this character in that they may be accomplished more accurately and in a much shorter space of time than has been possible heretofore.

The heretofore accepted procedure for determining crease resistance is known in the trade as the Tootal, Broadhurst & Lee procedure. This method includes folding a sample of the material to be tested, usually a strip 4 cm. by 1 cm., upon itself, placing a pre-determined weight thereon for a pre-determined length of time, removing the weight, picking up the folded sample by inserting a wire under the apex between the legs of the specimen, and measuring the separation of the legs on a scale. This test therefore measures crease resistance in terms of partial recovery to the initial flat state of the sample.

This procedure is objectionable in that it introduces the human element in picking up the sample and applying the same to a scale, it measures partial recovery based upon the separation of the end of the legs of the folded sample and is otherwise unreliable. It will be apparent that uniformity of results is not assured, as the sample must be handled after test, and moreover, the final figure does not take into consideration the tendency of the ends of the legs of the folded sample to approach each other, due to their weight. Thus, any reading by this method tends to give an inaccurate reading, as the legs have a tendency to approach each other and thus reduce the angle at the apex.

Another important object of the invention is to provide a method and apparatus which is not subject to the deficiencies of the prior accepted procedure.

To this end, the invention contemplates folding a standard sized sample of a material to be tested over a relatively thin and sharp horizontal supporting edge, clamping the folded material over the edge by placing thereon a spring-pressed pressure device which exerts a pre-determined pressure, leaving this device in place for a predetermined length of time and then removing the same. The apparatus is provided with a movable

2

protractor having an adjustable and separate arm, the base lines of the protractor and arm being movable so as to coincide with the angle at or near the apex of the folded material undergoing test, all without handling of the specimen after having been folded.

The invention further contemplates the apparatus for accomplishing the above purpose as more fully hereinafter described and shown in the accompanying drawings.

In the drawings:

Fig. 1 is a front elevation of a device embodying the present invention.

Fig. 2 is a side view of the device in Fig. 1.

Fig. 3 is an enlarged fragmentary front view of the device in Fig. 1 after the pressure device has been removed and showing partial recovery of the folded specimen.

Fig. 4 is a perspective view of the pressure device with a folded specimen clamped between its jaws.

Fig. 5 is a sectional view of the pressure device itself.

Referring now with particularity to the embodiment illustrated, a base is shown at 1, having a pair of supports 2, carrying at their upper ends a thin blade 3 or the like, the upper edge of which is substantially horizontal.

Behind the supports 2 is a pedestal 4, the upper portion of which terminates in a bearing 5, carrying a stub shaft 6, to which is secured a protractor 7 and an arm 8, both of which are freely rotatable around the stub shaft 6. The protractor and arm may conveniently be secured to the stub shaft as by transparent washer 9 and nut 10 on one side and by the knurled nut 11 on the other side. The nut may be used to secure the protractor and arm in the desired relationship for reading.

Referring now to Fig. 5, the pressure device includes a female element 12 and a male element 13, having clamping jaws 14 and 15 respectively. The male element 13 carries a threaded set screw 16, while the female element 12 is encircled by a coil spring 17, one end of which bears against the head of the knurled set screw 16 and the flanged portion of the female element 12, thus tending to cause the jaws 14 and 15 to approach each other. It will be noted that the tension on the spring 17 may be adjusted through proper manipulation of the set screw 16. A thumbpiece 18 is secured to the female element 12 so that upon grasping the thumbpiece 18 and the set screw 16 and causing them to approach each other against the tension of the spring 17, the

jaws 14 and 15 may be separated to the desired extent, whereupon release of the pressure on the parts 18 and 16 will permit the spring 17 to function and will press the jaws 14 and 15 together with a pre-determined pressure. This pressure may be adjusted by proper manipulation of the screw 16.

In conducting the crease resistance tests, a specimen of sheet material of standard size, say 4 cm. by 1 cm., is folded over the supporting edge of the blade 3, the jaws 14 and 15 of the pressure device separated, the latter inserted over the fold of the specimen, and the pressure device released so as to grip the folded specimen with the blade in between. The parts are left in this position for a pre-determined and standard length of time, whereupon the pressure device is removed without disturbing the folded specimen.

The movable protractor 7 and arm 8 are then adjusted so that their respective base lines 18 and 19 are made to coincide with those portions of the separated legs of the folded specimen near the apex of the fold and the opposite angle read direct on the protractor. Thus the angle of recovery of the folded specimen may be quickly and accurately determined without requiring handling of the specimen following the test.

It is to be noted that even if the ends of the separated legs of the specimen tend to droop, due to the weight, this will not materially affect an accurate reading where the angle is measured near the apex.

This application is a continuation of applicants' copending application Serial No. 573,060, filed January 16, 1945, and now abandoned.

While the invention is shown and has been described with reference to a particular embodiment, yet it is not to be restricted thereto but is

to be construed broadly and limited only by the scope of the claims.

What is claimed is:

1. A method of determining the crease resistance of a sheet which includes the steps of folding a sheet upon itself and over a supporting edge, applying a pre-determined pressure to the fold for a pre-determined time, removing the pressure and measuring the angle between the legs of the folded sheet.

2. A method of determining the crease resistance of a sheet which includes the steps of folding a sheet upon itself and over a supporting edge, applying a pre-determined pressure to the fold for a pre-determined time, removing the pressure and measuring the angle between the legs of the folded sheet without removing the folded sheet from the supporting edge.

3. An apparatus for determining the crease resistance of a sheet which includes a base carrying a supporting edge, means to crease a sheet folded over said edge and supported thereon, said base also carrying a protractor and an arm movable with relation to each other, both protractor and arm being movable about a common axis in line with the supporting edge.

LADISLAV BOOR.
LINTON A. FLUCK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,952,344	Webber	Mar. 27, 1934
2,319,377	Wallace et al.	May 18, 1943