April 4, 1967 T. D. AINSLIE 3,312,100

IMPACT WEAR TESTER

Filed June 2, 1964 2 Sheets-Sheet 1

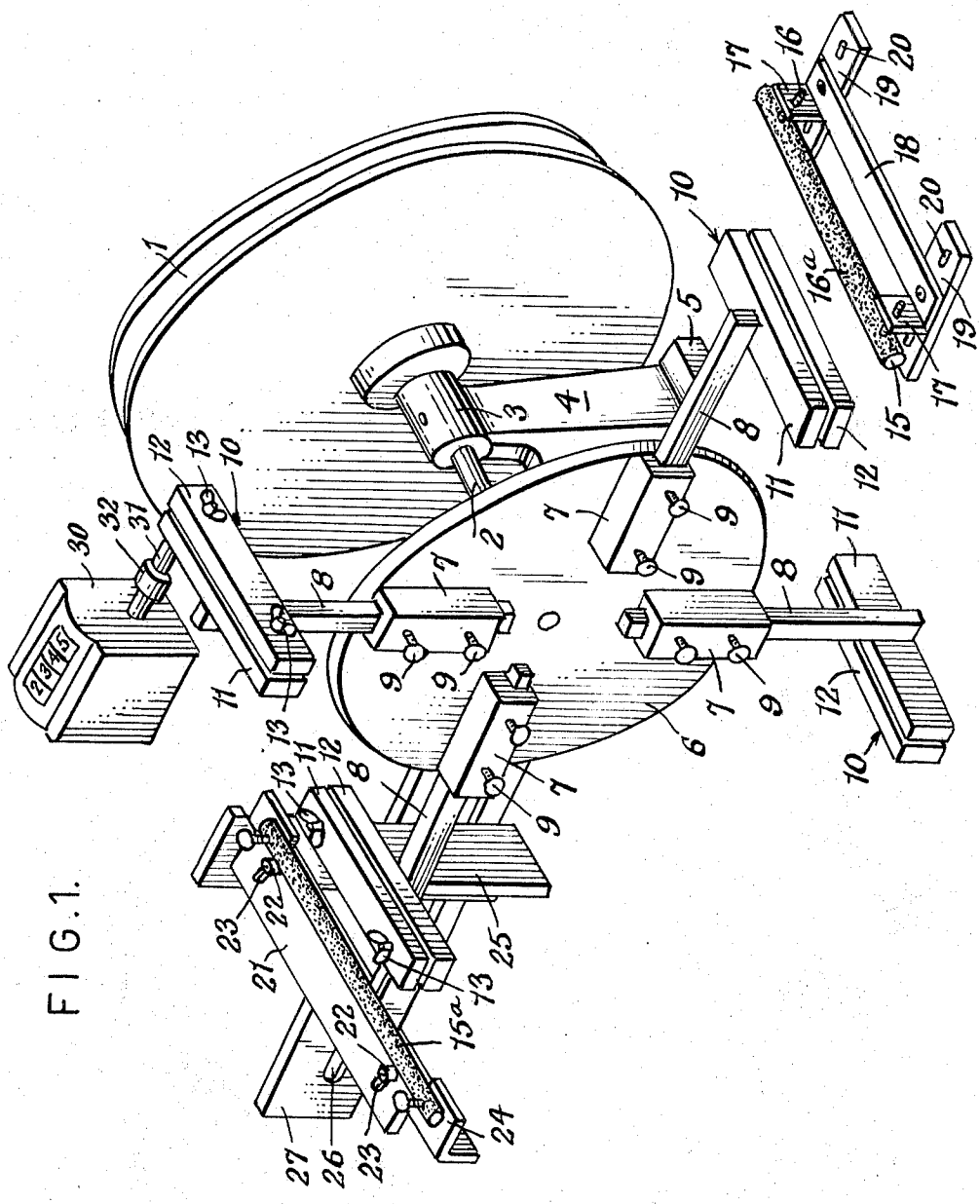


FIG. 1.

INVENTOR.
THOMAS DOW AINSLIE

BY ERIC Y. MUNSON

Attorney

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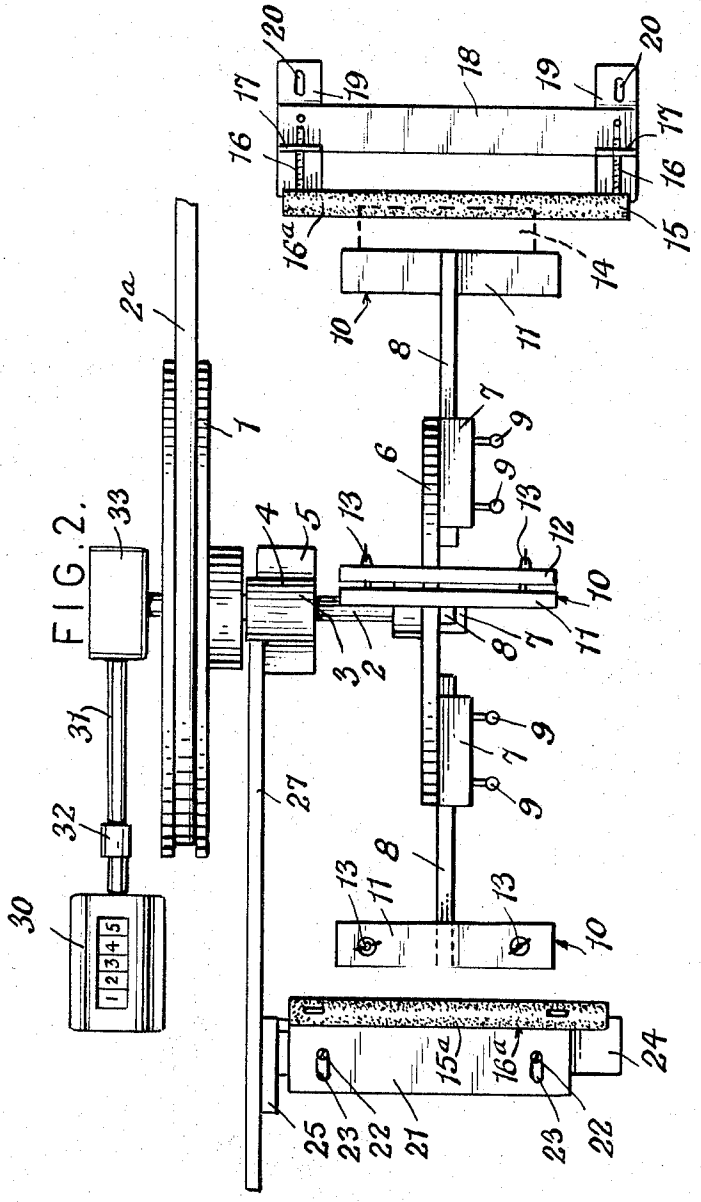


FIG. 2.

INVENTOR.
THOMAS DOW AINSLIE
BY ERIC Y. MUNSON

Attorney

United States Patent Office 3,312,100 Patented Apr. 4, 1967

3,312,100

IMPACT WEAR TESTER

Thomas D. Ainslie, Metuchen, N.J., assignor to Phillips-Van Heusen Corporation, New York, N.Y., a corporation of New York

Filed June 2, 1964, Ser. No. 371,991
2 Claims. (Cl. 73—7)

This invention relates to impact testing apparatus and more particularly to a device for determining the characteristics, construction and wearing possibilities of fabric or other sheet material, and is especially useful for testing cuffs, collars or other fabric elements.

It is an object of the invention to provide a device of this character and of relatively simple construction which will hold and rotate pieces of fabric, such as cuffs of shirts etc., and bring such fabric elements into contact with stationary abutments which can, if desired, have abrasive surfaces, thus subjecting the fabric elements to the effects of friction and enabling any deficiencies or weakness in the fabric, as well as its resistance to wear, to be ascertained.

More particularly, the invention contemplates the provision of a rotated disk provided with radially-extending adjustable arms, each of said arms carrying a clamp for holding the fabric element. Situated adjacent to the perimeter of the disk and beyond the clamps, is one or more abutments which can, if desired be abrasively-surfaced. When the disk is rotated, the fabric elements held by the clamps, will be extended by centrifugal force and the fabric elements will be wiped against the abutments as the fabric elements pass such abutments.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein an illustrative embodiment of the invention is disclosed,

FIG. 1 is an isometric view of an impact wear testing device constructed according to the invention, and

FIG. 2 is a top plan view of the same.

Referring to the drawing, **1** indicates a rotative pulley which is driven by a belt **2***a* (FIG. 2) from a motor or other power source not shown. The pulley **1** is mounted on a shaft **2** rotative in a bearing **3** provided at the upper end of a post or bracket **4** having its base **5** mounted on a table or other supporting surface.

Also secured on the rotated shaft **2** is a disk **6** constituting the rotor of the device. Mounted radially on one of the faces of the disk **6** are four sleeves **7**. The sleeves are arranged in equally spaced positions on the disk. Adjustably axially through each of the sleeves is a bar **8**, each of these bars being fixed in its sleeve in any required position of extension by means of set screws **9**.

The bars **8** constitute radial arms on the rotor disk **6** and mounted transversely at the outer end of each of these arms is a fabric-holding clamp **10**. Each clamp comprises a fixed strip or jaw **11** and a similar movable jaw **12**, the two jaws being brought together to clamp a fabric element such as a shirt cuff or collar or other piece, to be tested, between them. Bolts provided with wing nuts **13** are employed to bring the jaws of the clamp together in clamping position.

As the disk **6** is rotated, each clamp **10** carrying a cuff, collar or other fabric piece, such as indicated at **14** in dotted lines in FIG. 2, will be moved to bring its fabric piece into wiping contact with an abutment **15**, that can if desired, be abrasive surfaced, thereby subjecting the fabric to frictional wear and by repeated contact of the fabric with such abrasive element the lasting quality of the fabric under conditions of wear, or the deficiencies

of the fabric will be determined. As a result, any shortcomings in the fabric will be determined.

The abutments **15**, **15***a* may consist of a cylindrical rod which can be maintained relatively smooth or it can be covered by an abrasive material **16***a* such as sandpaper or the like and its roughness or smoothness be determined by the rigidity of the test to which the fabric is to be subjected. The abrasive rod **15** may be mounted in a number of ways. At the right in FIG. 1 the abrasive or other abutment **15** is held by threaded studs **16** which pass through it and enter into lugs **17** which are connected by a cross piece **18**, attached to feet **19** which are secured to a suitable support by screws or other fastening elements extended through slots **20** in the feet. This arrangement permits the abrasive rod or abutment to be moved toward or away from the clamps **10** to meet different requirements of spacing between the clamps and the abutment **15**, according to the nature and size of the material to be tested and to allow for different extensions of the fabric pieces from the clamps, or for other purposes.

The mounting of the second abutment shown at **15***a* includes a plate **21** which is adjustable by means of screws **22** entering slots **23** to bring the abutment **15***a* toward or away from the disk **6** and hence regulate the spacing between the clamps **10** and the rods **15***a*. The adjustable plate **21** is mounted on an angle bar **24** secured to an upright **25** that is adjustable along the length of a slot **26** in a horizontal bar **27** which may be provided as a lateral extension of the post **4**.

From the foregoing, the operation of the improved testing device will be readily understood.

The cuffs, collars or other pieces of fabric to be tested for wear or flaws in construction, are clamped between the jaws **11** and **12** of the clamps **10**, with parts of the pieces to be tested protruding out from between the jaws of the clamps to the required extent. As the disk or rotor is rotated, the parts of the cuffs, collars or other pieces extending out of the clamps will strike and wipe against the bars **15**, **15***a* and subject the pieces to frictional wear to determine the wearing characteristics of the fabric or to show up deficiencies in its construction.

By varying the grade of adhesive sheet material that is applied around the rods **15**, **15***a*, tests of various kinds can be readily made. To keep a record of the number of revolutions made by the rotor during tests, a revolution counter is employed as shown at **30**, the same being driven from a counter shaft **31**, connected to the counter **30** by a coupling **32**. The counter shaft **31** is driven in any suitable manner from the shaft **2**, such as by gearing contained in a housing **33**, the shaft **2** being the input shaft and the counter shaft **31** being the output shaft for such gearing.

By means of the described apparatus, the wearing characteristics of fabrics or other sheet materials generally subjected to frictional wear, and to deficiencies in manufacture or weaknesses in the material, can be readily determined. As the disk **6** is rotated, centrifugal force will extend the fabric pieces held by the clamps and the fabric pieces will wipe against the abutments **15**, **15***a*, thus subjecting the pieces to friction, and any loose threads or other deficiencies will be detected. By regulating the distance from the abutments, different areas of the cuffs or other fabric pieces can be made to take the full impact. As herein stated, the abutments **15**, **15***a* can be provided with roughened or abrasive surfaces or these abutments can be smooth to serve only as impact elements.

Having thus described a single embodiment of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. A fabric testing apparatus comprising, a disk and

ieans for rotating the same, a plurality of sockets mount-
d on one face of the disk and extending radially of the
ame, a bar fitted in each of the sockets and axially ad-
ustable through the same, clamping means on the sockets
or holding the bars in selected positions of extension out
f the sockets, the bars extending beyond the periphery
f the disk, a clamp provided at the outer end of each
f the bars for holding a piece of fabric to be tested,
butments in the form of non-rotative rods spaced from
ie ends of the bars and adapted to have their convex pe-
ipheries wipingly contacted by the fabric pieces during
he rotation of the disk, each rod having a rough convex
urface for contact with the fabric pieces to thereby sub-
ect the pieces to frictional wear as such fabric pieces are
noved into wiping contact with such surfaces when the
lisk is rotated.

2. A fabric testing apparatus as provided for in claim

1, and including a revolution counter for indicating the number of contacts of each fabric piece with an abutment, and means for actuating the same, said means being rotated from a shaft carrying the disk.

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DAVID SCHONBERG, *Primary Examiner.*