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EXTENSOMETER CLAMPING DEVICE

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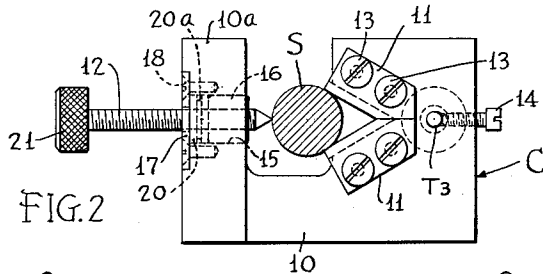


FIG. 2

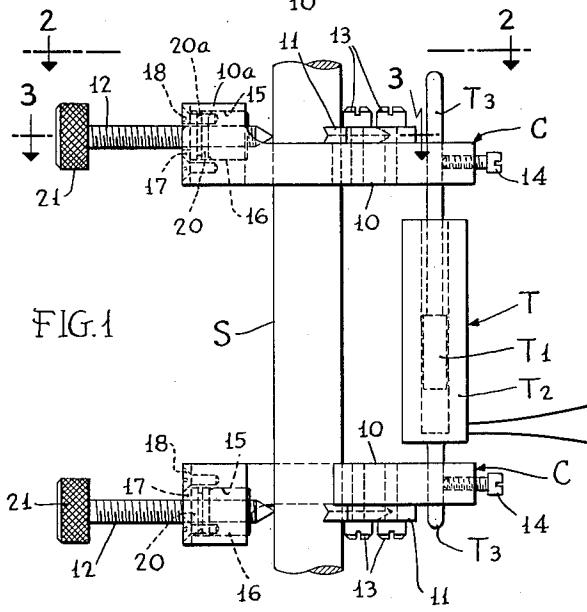


FIG. 1

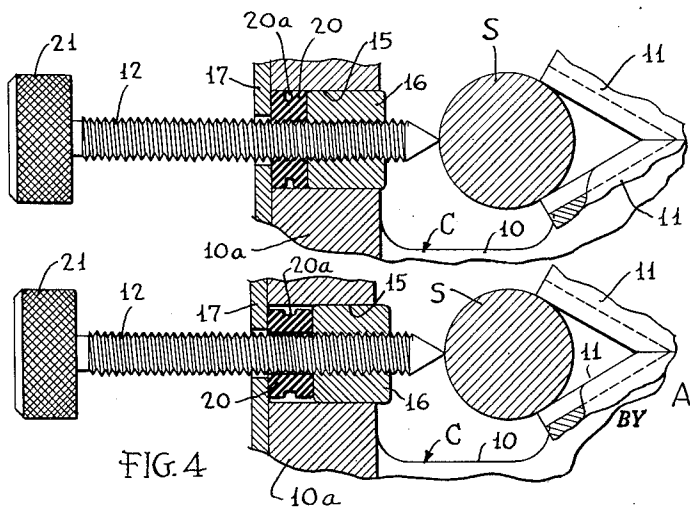


FIG. 3

FIG. 4

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EXTENSOMETER CLAMPING DEVICE

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5 Claims. (Cl. 24—263)

This invention relates to an extensometer clamping device and has for an object the provision of improvements in this art.

One of the particular objects is to provide a clamping device which will remain in clamped position when the test piece or specimen attenuates during a test.

Another object is to provide a clamping device which yields axially like a spring when brought up tight whereby to avoid burring the specimen-engaging elements.

Another object is to provide a clamping device which is self-locking by friction as to firmly resist loosening by vibration or otherwise, as in fatigue testing.

Another object is to provide a simple and inexpensive yet rugged and durable clamping device.

The above and other objects and advantages of the invention will be apparent from the following description of an exemplary embodiment, reference being made to the accompanying drawings wherein:

FIG. 1 is a side elevation of a test set-up in which the present clamping device is used;

FIG. 2 is a top plan view taken on the line 2—2 of FIG. 1, the specimen being shown in section;

FIG. 3 is an enlarged transverse section taken on the line 3—3 of FIG. 1; and

FIG. 4 is a section like FIG. 3 but showing the parts after the specimen has been reduced in diameter during test.

FIG. 1 shows a specimen S set up for test. A tensile test is suggested but the testing machine and the specimen clamping jaws have been omitted as not essential to an understanding of the present invention, the specimen merely being stretched endwise along its axis.

Two clamps C, either one of which embodies means of the present invention, are secured to the specimen in order to serve a transducer T which will indicate the strain or change in length of the specimen. Various types of transducers could be used, that shown being a simple inductive device, comprising a core T1 and a coil T2 secured respectively to the spaced clamps, which adds no appreciable load to the testing machine. The connection to the clamps is shown to be made by stems T3 and set screws 14.

The clamp C comprises a frame 10 having double knife-edge elements 11 arranged in V-shape which engage the specimen on one side and a pointed screw 12 for engaging the specimen on the other side. The knife-edged elements are double longitudinally and are secured to the frame 10 by screws 13. The pointed end of the screw 12 is directed toward the apex of the V and lies in a plane between the dual knife edges to provide a stable assembly when clamped on a specimen.

The frame 10 is generally C-shaped and has an enlargement 10a which provides an aperture 15 for the screw 12 and a floating nut 16 into which the screw is threaded. The bore of the aperture is enlarged to slidably receive the nut therein, the fit being close but not tight. The smaller part of the aperture through which the screw 12 alone slidably extends may be formed in a backing member or head 17 secured to the frame by screws 18.

Behind the nut 16 on the screw 12 there is disposed a resilient elastic grommet 20 which is of a size to enter

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the cylindrical bore in which the nut is disposed. During clamping one end of the grommet engages the head plate 17 and the other engages the rear of the nut. A knurled head 21 or other suitable means is provided on the rear end of the screw 12 for turning it.

The grommet 20 may be formed of a slightly spongy rubber or have a circumferential groove 20a, or both, so as to be compressible endwise during clamping. Initially the grommet may be smaller in diameter than the bore in which it is located. The rubber grommet provides friction at its ends to resist turning and to inhibit turning of the nut, the action being aided if desired by pulling backward on the screw as it is being turned.

When the point of the screw engages the specimen or a small positioning hole therein it will cause the nut to be pushed back in the bore to compress the rubber grommet which will shorten axially and enlarge (or compress) radially so as to lock in the bore, around the screw, and at its ends to keep the parts securely in place.

The nut and screw can back up so that the engagement is not hard and the knife edges and screw point will not be burred.

Thereafter, if the specimen attenuates, as shown in FIG. 4, the grommet will expand axially to cause the nut and screw to move forward to follow up the specimen and keep the clamp accurately in position thereon.

It is thus seen that the invention provides simple, inexpensive and effective means for clamping a specimen. And while one embodiment has been specifically described for purposes of illustration it is to be understood that there may be various embodiments and modifications within the broad scope of the invention.

What is claimed is:

1. A clamping device for a specimen, comprising in combination, a frame, fixed longitudinally spaced V-shaped knife edge means carried by the frame for engaging a specimen on one side, a pointed screw for engaging the specimen on the other side, a floating nut threaded on the screw and slidable in a bore in said frame, a head for the rear end of the bore slidably receiving the shank of the screw therein, and a resilient elastic grommet on said screw behind said nut in said bore, the grommet being of such length and diameter as to be expanded radially tightly in said bore when compressed axially during clamping for urging said screw and nut forward and for holding the nut against turning in the bore.

2. A clamping device as set forth in claim 1, wherein said grommet has an annular groove along its length to aid endwise compression of the grommet during clamping.

3. A clamping device for a specimen, comprising in combination, a specimen holder having specimen engaging means on one side and a bore therein on the opposite side, a clamping screw passing through said bore and arranged to clamp a specimen at its forward end, a head for said bore providing sliding movement of the screw therethrough, a nut slidably mounted in said bore and threaded on said screw, and resilient axially compressible means mounted on said screw between the nut and head in said bore for urging said screw and nut forward and for holding the nut against turning in the bore.

4. A clamping device as set forth in claim 3, wherein said compressible means is a rubber grommet of generally cylindrical shape, said grommet being of such length and diameter as to be expanded radially tightly in said bore when compressed axially during clamping.

5. A clamping device for holding a specimen which is reduced in cross-section area during testing, comprising

a specimen holder frame having an opening on one side, fixed longitudinally spaced V-shaped knife edge means carried by the frame for engaging a specimen on one side, a pointed screw for engaging the specimen on the opposite side, a free turning cylinder threaded on the screw and slidable in a cylindrical bore in said frame, a head plate attached at the rear of the bore on the frame having an aperture for receiving said screw, said plate substantially closing said bore, and a resilient deformable cylindrical ring fitted freely in said bore between said head plate and said free turning cylinder and clearing said screw, whereby a decrease in the height of the cylindrical bore will cause said cylindrical ring to inhibit turning of said free turning cylinder and a greater decrease in said height will lock said cylinders in said bore against said screw.

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