United States Patent [19]

Field et al.

[11] **3,818,620**

[45] **June 25, 1974**

[54] **EMBROIDERY HOOP**

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[22] Filed: **Sept. 28, 1973**

[21] Appl. No.: **401,631**

[52] **U.S. Cl.** **38/102.2**
[51] **Int. Cl.** **D05c 1/04**
[58] **Field of Search** 38/102.2

[56] **References Cited**

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Primary Examiner—Patrick D. Lawson

[57] **ABSTRACT**

An embroidery hoop includes a plastic inner ring element, a plastic outer ring element having a body with a gap therein, and means for adjusting the diameter of the outer ring element. The adjusting means takes the form of first and second parts, each of which is more massive than the body of the outer ring element. One of the parts is integral with the portion of the body situated on each side of the gap. The parts are provided with registering lateral apertures and are adjustably positionable relative to each other by a screw and nut assembly. The screw is received in the apertures of both parts and has a head portion located on the exterior side of the first part. A threaded portion adopted to engage the nut is situated on the exterior side of the second part. The screw is provided with a knurled portion fitting tightly within the interior of the aperture of the first part and effective to prevent rotation of the screw relative to the parts.

4 Claims, 3 Drawing Figures

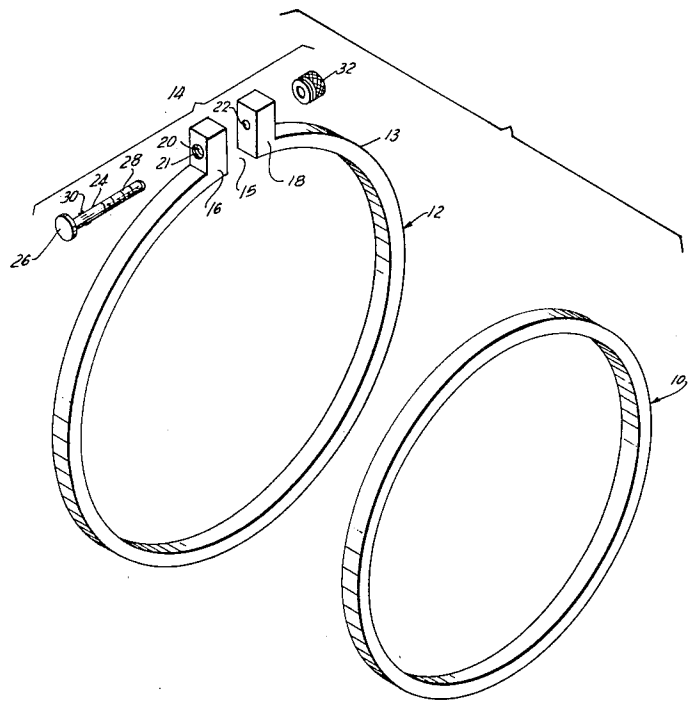


FIG. 1

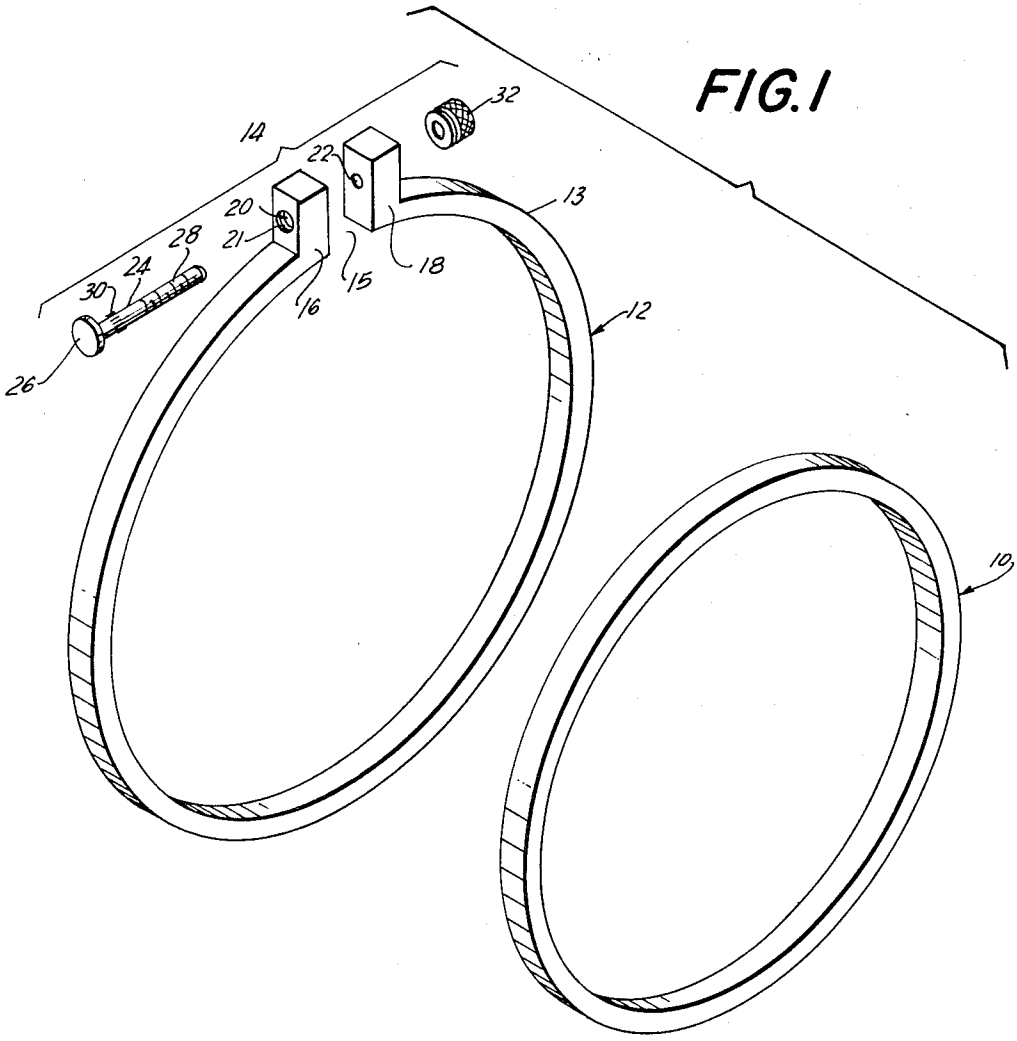
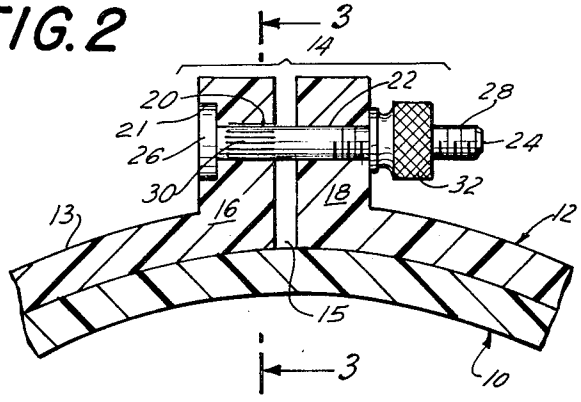


FIG. 2



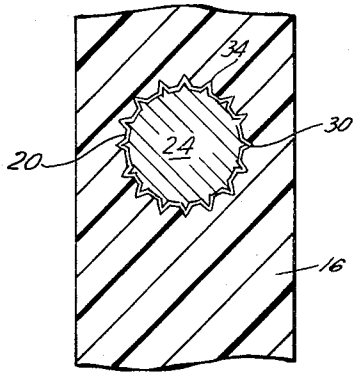


FIG. 3

EMBROIDERY HOOP

This invention relates to sewing implements and more particularly to a novel frame for use in embroidery.

Throughout history sewing in its various forms has been popular, not only as a practical endeavor but also as a hobby. Recently, embroidery has attained widespread popularity in this country, partially as a means of relaxation and partially due to the aesthetically pleasing results which can be achieved through this medium. Due to popularity of embroidery, the implements necessary to practice this art are currently available in many retail stores, both in kit form and individually.

Aside from the needles and yarn or thread necessary to practice this art form proficiently, a piece of cloth upon which the needle work is to be performed, as well as an embroidery hoop or frame are required. The cloth is generally of rectangular or square shape and is commonly mounted on a circular frame to provide a convenient working area. The cloth or fabric is preferably mounted on the embroidery hoop in such a way as to retain the entire working area taut while permitting easy access thereto.

Conventional embroidery hoops are formed of two wooden or metal rings. One of the rings has a slightly larger diameter than the other such that the larger ring can be fitted around the smaller ring leaving a clearance therebetween approximately equal to the thickness of the cloth. A circular work area is therefore provided with a diameter equal to the diameter of the inner ring. When the work in this area is completed, the fabric is demounted and moved relative to the hoop. The cloth is then remounted to create a different work area. In this way the entire fabric, with the exception of a small peripheral area, can be worked upon.

Normally, conventional hoops are provided with a means of adjusting the diameter of the outer ring. In order to mount the fabric, the diameter of the outer ring is expanded and the fabric is placed over the inner ring and held under tension. The outer ring is then slipped over the inner ring and the diameter of the outer ring is contracted until the fabric is clasped securely between the rings. In this way, the fabric is held taut and the artisan's ability to perform embroidery proficiently is significantly enhanced.

Conventional embroidery hoops are impractical for a number of reasons. Hoops made of metal bend and deform under pressure. Hoops made of wood tend to splinter, break and crack. Further, humidity and temperature may affect the shape or size of wooden rings. Splintering of the hoop is particularly undesirable because the sharp edges which result therefrom may tear the fabric or the artisan's clothing. Changes in shape and size of the rings may adversely effect the utility of the hoop as the rings will not necessarily deform in the same manner thus preventing them from fitting together properly. Further, as the rings change size, this may alter the clearance between the rings thus preventing the proper clamping of the fabric therebetween.

Moreover, conventional hoops are expensive, not only because wood and metal are expensive, but because the wood must be carefully finished so that there are no portions which are not completely smooth. Further, wooden hoops must be treated to prevent warping and shape deformation, and metal hoops, because of the thinness of the metal rings must be structurally reinforced. Moreover, the rings must be perfectly round and of precisely the correct diameter so that they fit together in the appropriate manner.

It is therefore a prime object of the present invention to provide an embroidery hoop which will not splinter, break, crack, warp or change its shape or size under pressure or due to humidity and temperature variations.

It is another object of the present invention to provide an embroidery hoop wherein the outer ring has a novel diameter adjustment means which facilitates mounting and demounting of the fabric on the hoop.

It is a further object of the present invention to provide an embroidery hoop which can be inexpensively manufactured by modern production line techniques.

In accordance with the present invention an embroidery hoop or frame is provided having a plastic inner ring element, a plastic outer ring element having a body with a gap therein, and means for adjusting the diameter of the outer ring element. The adjusting means comprises a first and a second part each of which is more massive than the body of the outer ring element. One part is integral with the portion of the body situated on each side of the gap. The parts have registering lateral apertures therein and are adjustably positionable relative to each other by a screw and nut assembly. The screw passes through the apertures and has a head portion located on the exterior side of the first part. A threaded portion adopted to engage the nut is situated on the exterior side of the second part. The screw has a knurled portion situated within the interior of the aperture of the first part and effective to prevent rotation of the screw relative to the parts.

The interior of the aperture of the first part is provided with a plurality of indentations corresponding to the knurls on the screw. These indentations are formed during the manufacturing process by inserting the screw into the aperture before the plastic outer ring element is fully cured. The interior of the aperture of the first part is slightly deformed by the knurls on the screw and is caused to set with the indentations therein. In this way, the knurled portion of the screw interlocks with the interior of the aperture thus preventing any rotation of the screw with respect to the part as the nut is turned to change the diameter of the ring.

To the accomplishment of the above and to such other objects as they may hereinafter appear, the present invention relates to an embroidery hoop as defined in the appended claims and as described in the specification, taken together with the accompanying drawings wherein like numerals refer to like parts and in which:

FIG. 1 is an exploded isometric view of the preferred embodiment of the present invention;

FIG. 2 is a cross-sectional view of the means for adjusting the diameter of the outer ring element; and

FIG. 3 is a cross-sectional view taken along lines 3—3 of FIG. 2.

The embroidery hoop of the present invention comprises an inner ring element generally designated **10** and an outer ring element generally designated **12**, both of which are manufactured of unbreakable plastic. The outer ring element **12** has a body **13** with a gap **15** provided therein. The diameter of inner ring element **10** is such that it will fit within outer ring **12**. Outer ring **12** is provided with means, generally designated **14**, for

adjusting the diameter thereof. Means 14 comprises a first part 16 and a second part 18, each of which is more massive than the body 13 of outer ring element 12, thus providing greater structural stability. One of the parts is integral with and extends radially outward from each of the portions of body 13 situated on opposite sides of a gap 15. Parts 16 and 18 are provided with registering lateral apertures 20 and 22, respectively into which screw 24 is adopted to be received.

Screw 24 has a head portion 26, a threaded portion 28 and a knurled portion 30. A nut 32, preferably rounded in shape with a knurled periphery to facilitate gripping thereof, is provided to threadedly engage the threaded portion 28 of screw 24. Preferably, aperture 20 in part 16 is provided with a countersunk enlarged portion 21 on the exterior side of part 16 which is adopted to receive head portion 26 therein such that when the screw is received in part 16, head portion 26 is flush with the exterior surface of part 16.

Adjusting means 14 is assembled, as shown in FIG. 1, by inserting screw 24 through apertures 20 and 22 with head portion 26 being received into the enlarged portion 21 of aperture 20 on the exterior side of part 16. The portion of screw 24 which is situated within aperture 22 is relatively freely received therein. The threaded portion 28 of screw 24 extends beyond the exterior side of part 18 to permit threaded engagement with nut 32. The rotation of nut 32 will axially move nut 32 along screw 24 thus causing parts 16 and 18 to move relative to each other. The movement of parts 16 and 18 relative to each other causes an adjustment of the gap length between these parts thus changing the diameter of outer ring 12.

The knurled portion 30 of screw 24 is situated along the length of the screw such that once head 26 is received within the enlarged portion 21 of aperture 20, the knurled portion 30 is received within the interior of aperture 20. Preferably, screw 24 is inserted within part 16 prior to the completion of the curing process of the plastic from which the frame is molded. In this way, a series of indentations 34 in the interior of aperture 20 are formed by the presence of knurled portion 30. The plastic is then permitted to fully cure, thus setting the indentations 34 in the interior of aperture 20 permanently. The combination of the knurls and indentations significantly enhances the frictional engagement between screw 24 and part 16 thus preventing any rotation of the screw relative to part 16. Thus, nut 32 can be rotated relative to screw 21 without causing any rotation of screw 24.

The knurled portion 30 may be composed of a plurality of randomly placed knurls or knurls which are formed in a pattern. As shown in the drawings, the knurls on portion 30 are in the form of spline grooves. The corresponding indentations 34 in the interior of aperture 16 will, when spline grooves are used as knurls, take the form of oppositely oriented spline grooves thus forming interlocking surfaces adopted to prevent rotation therebetween.

The embroidery hoop of the present invention eliminates the disadvantages of prior art embroidery hoops by utilizing unbreakable plastic instead of wood or metal which prevents splintering, cracking and breaking, as well as minimizes size and shape changes. Further, the frame of the present invention is inexpensively manufacturable by modern assembly line production techniques.

A preferred embodiment has been specifically disclosed herein for purposes of illustration. It is apparent that many variations and modifications may be made upon the specific structure disclosed herein. It is intended to cover all of these variations and modifications which fall within the scope of this invention as defined by the appended claims.

We claim:

1. An embroidery hoop comprising a plastic inner ring element, a plastic outer ring element having a body with a gap therein and means for adjusting the diameter of said outer ring element, said means comprising a first and a second part, each of said parts being more massive than said body of said outer ring element, one of said parts being integral with the portion of said body situated on each side of said gap and extending radially outward therefrom, said parts having registering lateral apertures therein and being adjustably positionable relative to each other by a screw and nut assembly, said screw being received within said apertures and having a head portion larger than said apertures, said head portion being situated on the exterior side of said first part, said screw having a threaded portion adopted to engage said nut, said threaded portion being situated on the exterior side of said second part, said screw being relatively freely received within the aperture of said second part and a knurled portion situated in contact with the interior of the aperture in said first part and effective to prevent rotation of said screw relative to said parts.

2. The hoop according to claim 1 wherein said knurled portion comprises a plurality of spline grooves.

3. The hoop according to claim 1 wherein the interior of the aperture of said first part has a plurality of indentations corresponding to the knurls on said knurled portion.

4. The hoop according to claim 2 wherein the interior of the aperture of said first part has a plurality of spline grooves corresponding to the spline grooves on said knurled portion.

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