

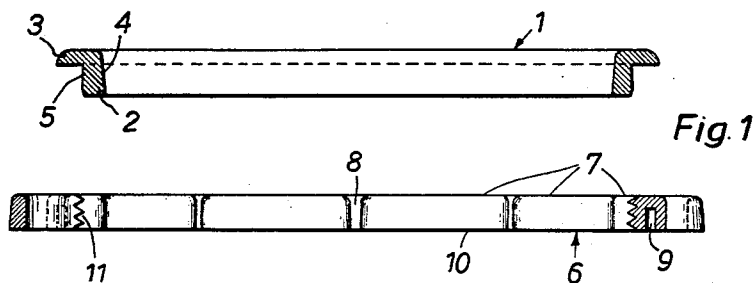
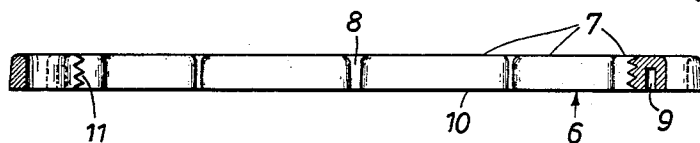
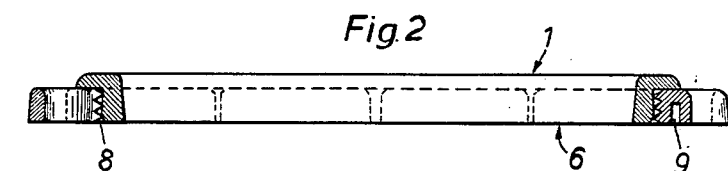
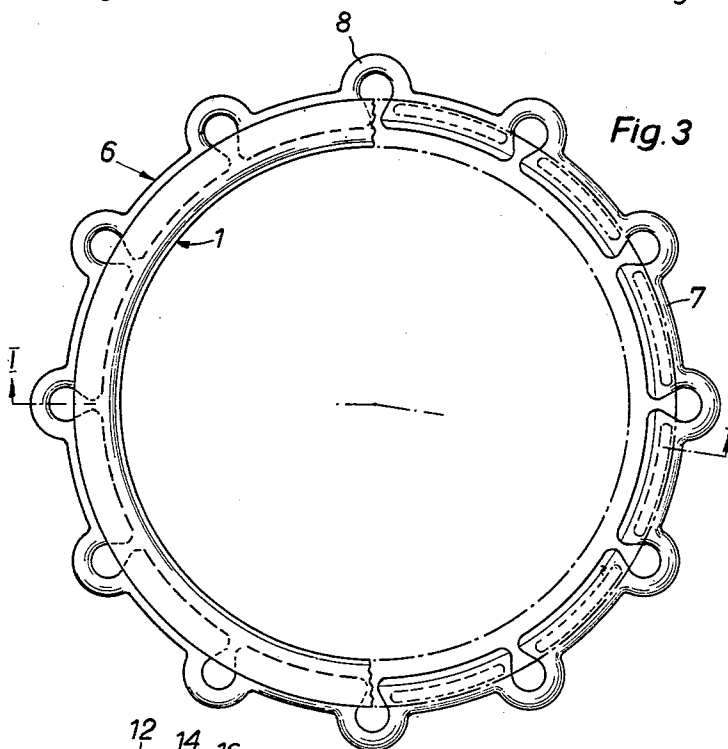
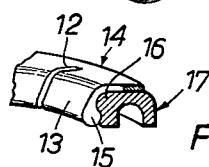
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STRETCHING FRAME

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1

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STRETCHING FRAME

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This invention relates to a new and useful stretching frame to be used particularly for stretching a fabric to do embroidery or mending work.

Stretching frames of this type, also called embroidery frames or tambour frames usually consist of an inner and an outer stretching ring, one of these rings being an open ring which is located within or around the closed ring, so that it keeps the fabric to be embroidered in place, either due to the tension of the ring itself or due to tensioning members acting at the two ends of the open ring. In any case, a sufficient stretching of the fabric could only be obtained by expanding or by contracting the open ring. This, however, has the undesired effect, that the open ring loses its circular form, so that the fabric is not equally gripped and secured along the circumference of the frame.

It is an object of the invention to provide a new stretching frame of simple design.

A further object of the invention is to provide a stretching frame that is easy to operate.

A still further object of the invention is to provide an equal tensioning of the fabric, along the circumference of the frame, independently of the thickness of the fabric.

The invention consists in a stretching frame comprising inner and outer stretching rings, one of these rings carrying clamping members which yieldingly engage the other ring.

Referring now to the accompanying drawings:

Fig. 1 shows a transverse section of the two rings of the frame in separated position,

Fig. 2 is a transverse section with the two stretching rings in operative position,

Fig. 3 is a plan view of the stretching frame with parts broken away,

Fig. 4 represents a fragmentary perspective view of a second embodiment of the invention.

In the drawing, the inner stretching ring 1 has an annular abutment flange 3 surrounding the upper end of the ring body 2. From this end of the ring body the inner ring surface 4 tapers inwardly whereas the outer ring surface 5 slightly tapers outwardly to the other end, where the edge is rounded or chamfered. The angle of the outer ring surface 5 with respect to an axially extending plane preferably is 2°.

The outer stretching ring 6 is formed of clamping jaws 7 constituting annular segments (see also Fig. 3), which are connected together by means of elastic connecting links 8 bridging the spaces between the segments 7. In the example shown, the outer stretching ring 6 is made of one piece. The segments 7 are provided with slots 9 so that the segments 7 are of U-shaped cross section, the U being open towards the bottom surface 10.

The inner surface of the segments is provided with V-shaped ribs preferably forming an angle of 60°. When according to Figs. 2 and 3, the inner stretching ring is inserted into the outer stretching ring 6, the V-shaped ribs 11 are urged against the outer ring surface 5 of the inner stretching ring, due to the tension created by the

2

resilient connecting links 8. The inside diameter of the outer stretching ring 6 and the outside diameter of the inner stretching ring 1 are adjusted so that, upon the insertion of one ring into the other, the segments 7 are pressed slightly radially outwards, thereby elastically stretching the connecting links 8. It is clear, that, when a fabric is stretched in the frame between the outer ring surface 5 of the inner stretching ring and the ribs 11 of the outer stretching ring 6, the radial movement of the segments and the elastic stress on the connecting links 8 is increased. In all cases it is therefore possible to exert sufficient tension on the fabric.

In order to stretch a piece of fabric on the frame, the fabric is laid on the outer stretching ring 6. Then, the inner stretching ring 1 is placed on the fabric, centered with respect to the outer stretching ring, and pushed into it as far as the abutment flange allows. Thereby the ribs 11 come successively into contact with the fabric and brake its movement with respect to the outer stretching ring 6, so that the fabric is not only kept between the stretching rings, but also tightly stretched over the inner stretching ring. Under these circumstances no special tensioning operation is required as it was necessary on known types of stretching frames.

With the exception of the small spaces between the segments 7 the tension is equally distributed at the circumference of the inner ring and also within the single segments. The edges of the ribs are on their whole length in contact with the fabric. Besides by the selection of the proper material, this effect is assisted by the shape of the segments of which particularly the walls provided with the ribs 11 are resilient.

The stretching frame is preferably made of die-cast plastic. The design of the rings is such that they can be easily molded. However, it is possible to use other materials, also metals, either alone or in combination, whereby they may be machined in any desired manner.

According to Fig. 4, clamp jaws 13 have been formed by cutting slots 12 into the material of the inner ring. The clamping effect can be obtained by torsional straining of the bridge between the clamp jaws and/or by the deformation of the clamp jaws themselves. The bridge has a bead 15 which engages behind a bead 16 of the outer stretching ring 17.

In order to show the multiplicity of possible embodiments of the invention other examples are discussed. In one embodiment of the invention, the segments of the outer stretch ring are kept together by a ring of plastic material. In another embodiment of the invention the segments are arranged within a solid ring with a layer of elastic links being embedded between them, or the segments themselves are made of an elastic material. The segments 7 are shown in Fig. 3 can also be designed as clamp jaws having a plane clamping surface. In this case, when a section is made through the outer ring, the intersectional lines at the clamping surfaces would form a polygon. The section through the outer stretching ring could also be a polygon. However, also an inner ring with a cylindrical clamping surface can be used, to which surface the plane surfaces of the outer ring are fitting. This arrangement can also be reversed so that the clamping parts having a plane clamping surface are arranged on the inner stretching ring. It is also possible to corrugate the inner or the outer stretching ring and to obtain the stretching tension by a suitable design and by the selection of an appropriate material.

We claim:

1. A stretching frame comprising an inner ring and an outer ring fittable one within the other, said outer ring including a plurality of clamping jaws exerting a resiliently yielding pressure on the inner ring and having gripping ribs extending in a plane parallel to the plane of the rings

3

to engage a surface of the inner ring and retain there-
between the material to be stretched, the rib engaging
surface of said inner ring being slightly inclined with re-
spect to the axis of the ring so that the outside diameter
of said inner ring near one side thereof is greater than the
outside diameter near the other side whereby upon inser-
tion of the inner ring into the outer ring the outer ring
will be slightly expanded.

2. The stretching frame of claim 1 wherein said inner
ring has an annular flange extending outwardly from the
side thereof having the smaller diameter to provide a stop
for abutting against one side of the outer ring when the
rings are fitted together.

4

3. The stretching frame of claim 2 wherein the side of
the inner ring having the greater diameter is provided
with a chamfer where it meets the rib engaging surface to
provide for easier insertion of the inner ring into the outer
ring.

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