June 18, 1963 M. D. TETREAULT 3,093,957

RING HOLDER

Filed June 8, 1960

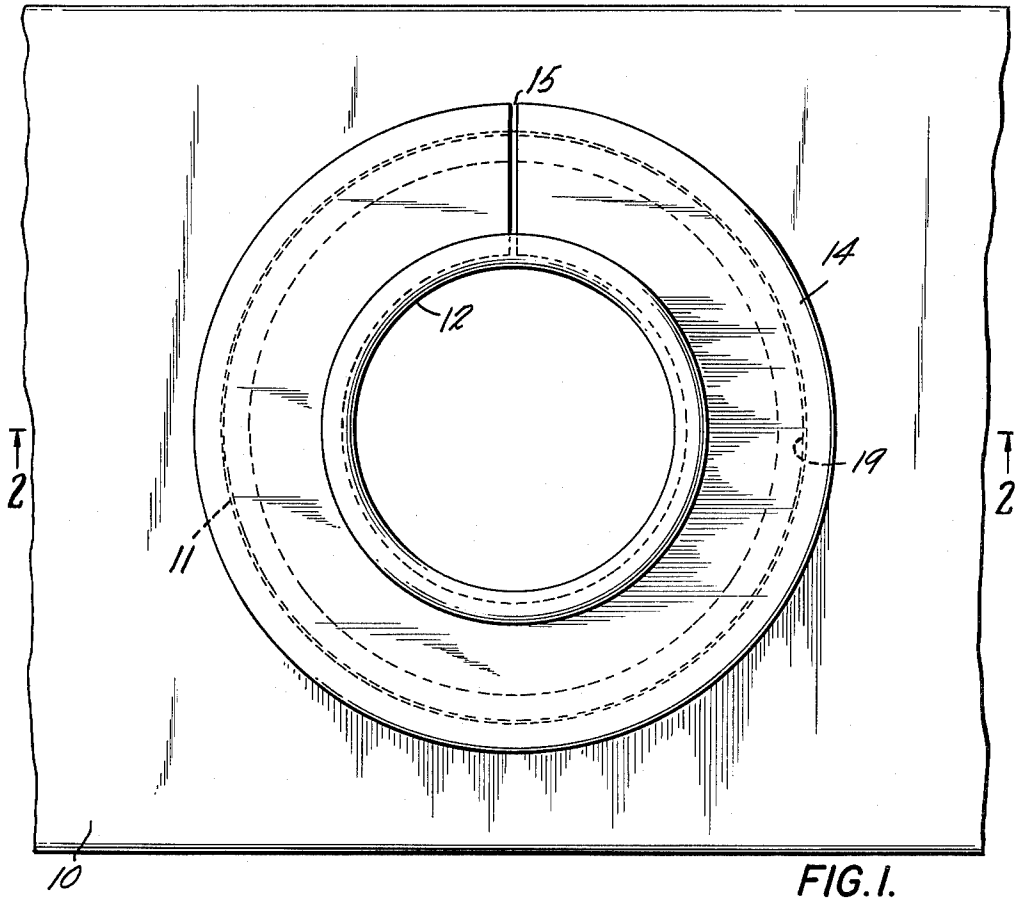

FIG. 1.

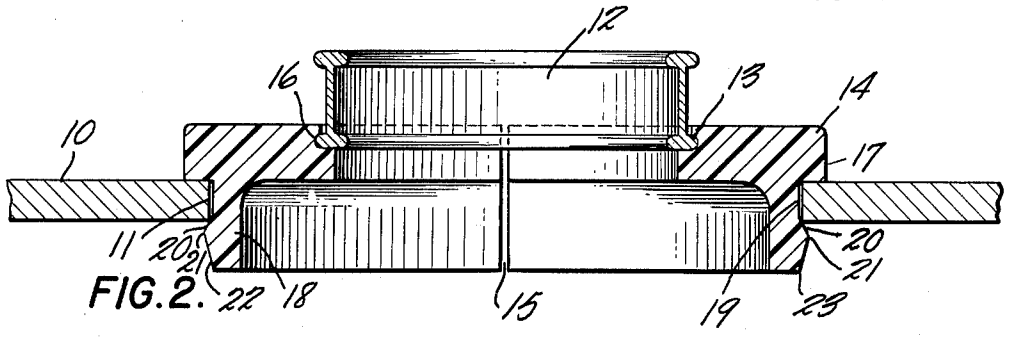

FIG. 2.

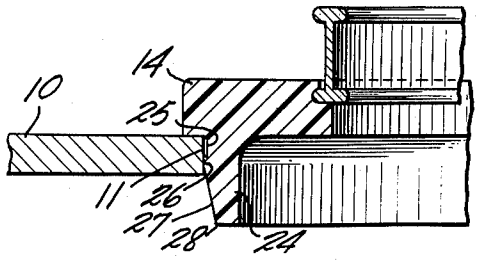

FIG. 3.

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United States Patent Office 3,093,957 Patented June 18, 1963

3,093,957

RING HOLDER

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Filed June 8, 1960, Ser. No. 34,740
2 Claims. (Cl. 57—122)

This invention relates to apparatus for holding rings, such as spinning or twisting rings, in the ring rail of the machine in which the rings are to be used and embodies, more specifically, mechanism by means of which such rings may be conveniently installed and removed from their operating positions and, at the same time, maintained effectively in such positions during operation of the machine.

Holders for securing rings in machines such as above-mentioned have heretofore been provided of metal and are illustrated, for example, in the patent to Stuart No. 2,273,387. In these presently existing holders, there is provided a spring in the form of a split resilient ring which may be snapped on or off the ring holder in order to secure it in its operative position in the ring rail. The difficulty of removing such springs in order to permit the ring holder and ring to be removed and to permit replacement of the ring will be readily apparent, and an object of the present invention is to provide a ring holder of improved structure by means of which the holder may be conveniently and effectively secured in its operating position, as well as to enable it to be removed therefrom and replaced at will.

Yet another object of the invention is to provide a ring holder of the above character in which the normal resiliency of the body of the holder mechanism itself is utilized to maintain the holder effectively in its operating position and yet to permit it to be removed therefrom without difficulty.

The foregoing and other objects are attained by providing a ring holder of yielding non-metallic material having a natural resiliency such that it may be pressed or snapped into its operating position and, by virtue of the resiliency of the material of the holder, maintained effectively in such position until its removal is desired.

Other and further objects of the invention will be apparent as it is described in greater detail in connection with the accompanying drawings, wherein:

FIG. 1 is a plan view of a portion of the ring rail of a machine in which rings are utilized;

FIG. 2 is a view in vertical elevation, taken in section on the plane indicated by the line 2—2 in FIG. 1 and looking in the direction of the arrows; and

FIG. 3 is a partial view similar to FIG. 2 and showing a modified form of the invention.

Referring to the above drawings, a portion of a ring rail of a spinning or twisting machine is illustrated at **10** and, in accordance with standard practice, provided with a plurality of apertures **11** in which rings **12** are adapted to be secured. The structure of these rings is well-known, being alluded to, for example, in the aforesaid patent to Stuart No. 2,273,387, and need not be further described herein. It is sufficient to state that these rings are provided with at least one flange **13**. In the form of ring illustrated in the drawings, the ring is provided with inner and outer flanges at both the top and bottom thereof although, for the purposes of this invention, consideration will only be given to the outer bottom flange **13**.

In order that the ring **12** may be secured within the aperture **11** of the ring rail **10**, a ring holder **14** is provided in the form of an annular member that is formed of a material that is resilient and non-metallic. It is provided with a split **15** in order that the flange **13** may be

received within a lipped groove **16** that is formed within the inner periphery of the annular member **14**.

Referring to FIG. 2, it will be seen that the ring **12** is inserted into the holder **14** by spreading the holder somewhat at its split **15** so that the flange **13** may be snapped or inserted into the groove **16**. The natural resiliency of the material of the annular member **14** will cause the latter to return to its normal position substantially as illustrated in FIG. 2, thus to hold the ring **12** in the position illustrated.

Beneath the plane of the groove **16**, the holder is provided with a ring holder rail seat **17** that is adapted to be held securely against the upper surface of the rail **10**. Beneath the rail seat **17**, the ring holder is formed with a downwardly extending annular flange **18** having a relief groove **19** and an outwardly tapering locking surface **20**. The surface **20** terminates in a rib or edge **21** that is larger than the diameter of the aperture **11** and, therefore, because the relief groove **19** is smaller than the thickness of the rail **10**, the sloping surface **20** urges the ring holder rail seat **17** into its normal position as illustrated in FIG. 2. Beneath the rib **21**, the outer surface **22** of the flange **18** slopes inwardly to a point **23** which is a starting diameter for the ring holder that is less than the diameter of the aperture **11**.

As will be clearly seen from FIG. 2, after the ring **12** is inserted with its flange **13** in the groove **16**, the ring holder may be pressed downwardly into the aperture **11** until the edge **21** snaps over the lower edge of the aperture **11**. The natural resiliency of the material of the holder **14** causes the forces within the holder not only to hold the ring within the holder, but to maintain the holder within the ring rail section **10**. There is a strong compressive force existing within the holder and by reason of the aperture **11** in the ring rail **10** that is contrary to and opposes the holding or expansive force of the ring **12** in the groove **16**. These forces provide ample holding power for the entire assembly and enable the assembly easily to be removed from the rail or to be applied thereto. It will be observed that the forces above-mentioned lie in different planes, that is, the expansive force of the ring **12** is outwardly in a plane somewhat above the plane of the compressive forces that are applied by the aperture **11**.

In practice it has been found that the ring holder mechanism is highly effective when it is made from a plastic material such as "Derlin," a plastic now commonly available on the market and susceptible of being molded in the desired shape.

In the form of the invention illustrated in FIG. 3, the ring holder **14** is provided with a downwardly extending annular flange **24** that is provided with a relief groove **25** and a compression contact surface **26** that is adapted to engage against the inner periphery of the aperture **11**. Beneath the contact surface or seat **26**, the flange **24** slopes downwardly at **27** and terminates in an edge **28** that is of a diameter substantially less than the diameter of the aperture **11**. In this form of the invention, the ring holder and ring are merely pushed downwardly into their operating position, as illustrated in FIG. 3. In this structure, the compressive force within the flange **24** is relied upon to maintain the holder in its operative position whereas, in the device shown in FIG. 2, the edge **21** and sloping surface **20** provide a hold-down locking action that urges the ring holder rail seat against the rail.

While the invention has been described with reference to the specific structure shown in the accompanying drawings, it is not to be limited save as described in the appended claims.

I claim:

1. Means for holding a ring in a ring rail having two

oppositely-facing outer surfaces and means defining a ring-holder-receiving aperture, comprising

an integral annular member made of a resilient non-metallic material and having

(*a*) a split formed therein,

(*b*) a groove in its inner periphery for tightly engaging a flange on a ring to be held in said ring rail,

(*c*) a rail seat on its outer periphery for tightly engaging one of said two surfaces of said ring rail,

(*d*) a relief groove in its outer periphery adjacent to said rail seat, lying within said aperture in said ring rail, and spaced apart from said aperture-defining means, and

(*e*) a bearing surface on its outer periphery adjacent to said relief groove on the side thereof opposite said rail seat for tightly engaging said ring rail.

2. Means for holding a ring in a ring rail having two oppositely-facing outer surfaces and means defining a ring-holder-receiving aperture, said aperture-defining means forming junctures with said surfaces, comprising

an integral annular member formed about an axis and of a resilient nonmetallic material and having

(*a*) a split formed therein,

(*b*) a groove in its inner periphery for tightly engaging a flange on a ring to be held in said ring rail,

(*c*) a rail seat on its outer periphery for tightly engaging one of said two surfaces of said ring rail,

(*d*) a relief groove in its outer periphery adjacent to said rail seat, lying within said aperture in said ring rail, and spaced apart from said aperture-defining means,

(*e*) a generally frusto-conical surface on its outer periphery adjacent to said relief groove on the side thereof opposite said rail seat, said frusto-conical surface (i) tapering away from said axis and from said one of said two surfaces of said ring rail for tightly engaging said ring rail at the juncture of the second of said two surfaces of said ring rail with said aperture-defining means and (ii) terminating beyond said second surface of said ring rail in a rib having a greater diameter than that of said aperture, and

(*f*) a generally frusto-conical surface on its outer periphery tapering from said rib towards said axis and away from said two surfaces and terminating in an edge having a diameter less than that of said aperture.

References Cited in the file of this patent

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