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EXPANDING MANDREL ASSEMBLY

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Fig. 1

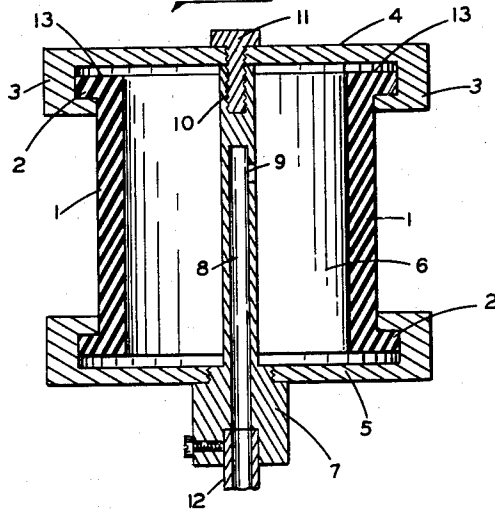


Fig. 2

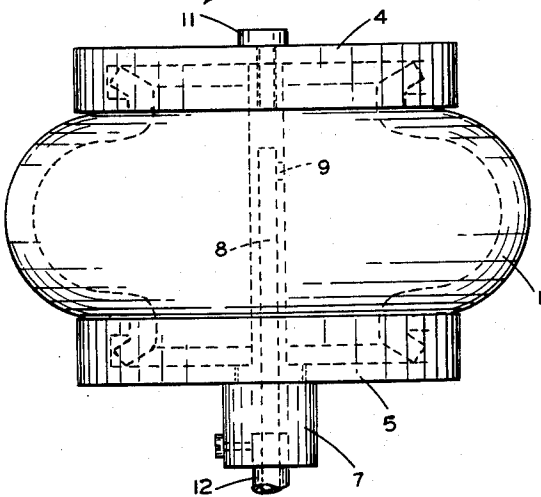
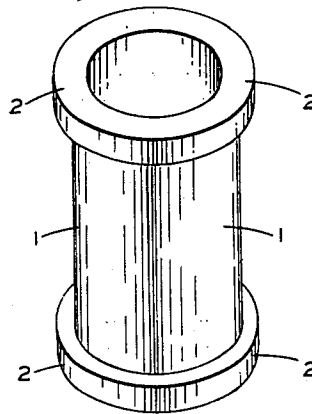


Fig. 3



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4 Claims. (Cl. 279-2)

This invention relates generally to an expanding mandrel assembly, and more particularly to an expanding mandrel adapted to retain a bobbin. Still more particularly the invention relates to an expanding mandrel used particularly as a twister on textile machinery in order that the bobbin may be rapidly and easily placed on the mandrel and removed therefrom.

The bobbins now in use have a tapered interior and must be forced onto tapered driving shafts in order to prevent slippage of the bobbin during rotation. Once the bobbin has been forced on the shaft, it is often difficult to remove. There is, therefore, a need for a device that will allow easy and rapid removal and installation of a high-speed bobbin used to wind up threads and yarns on textile machinery.

It is the primary object of the present invention to supply such a device. It is a further object of the present invention to supply an expanding mandrel which will quickly and tightly grip a bobbin placed thereon and which will allow ready release of the bobbin once the mandrel is returned to a nonexpanded condition.

These objects are achieved in a surprisingly straightforward and effective manner. The invention contemplates an expanding mandrel assembly comprising in combination a hollow, open-ended, cylindrical rubber sleeve having raised flanges at each end thereof. A pair of cylindrical supporting caps having shoulders adapted to receive the flanges on the sleeve are mounted on the open ends of the sleeve to form airtight seals at the ends. Means for admitting air under pressure into the sealed interior of the sleeve is provided in order to cause the sleeve to expand and press against the interior of a bobbin. Finally, there is preferably provided means for rotating the assembly of the caps and expanded sleeve with the bobbin thereon.

The invention will be more readily understood by reference to the accompanying drawings, in which:

FIG. 1 is a longitudinal section of the assembly of the invention,

FIG. 2 shows the assembly of FIG. 1 wherein the sleeve is in an expanded condition, and

FIG. 3 is an isomeric view of the sleeve itself.

Referring to the drawings, in which like parts have the same numbers, the rubber sleeve 1 has raised flanges 2 at each end thereof. The flanges 2 are an integral part of the sleeve 1 and are most conveniently constructed by removing a portion of the middle area of the cylindrical sleeve 1. The flanges 2 of the sleeve 1 are gripped by the shoulders 3 of the top cap 4 and the bottom cap 5. This arrangement forms the sealed chamber 6 bounded by the

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sleeve 1 and the caps 4 and 5. Admission of air into the sealed chamber 6 may be accomplished by a shaft adapter 7 having an air conduit 8 leading to the air outlet 9. The shaft adapter 7 may then carry at the top thereof a screw seat 10 adapted to receive the retaining screw 11 which holds the top cap 4 in position against the shaft adapter 7. The shaft adapter 7 is affixed to the supporting hollow shaft 12 which is most conveniently the shaft of an air motor, not shown, but the supporting shaft 12 may comprise any hollow shaft which is fixed or which is adapted to rotate and thus turn the assembly of the caps 4 and 5 and the sleeve 1.

The gaps 13 allow play of the flanges 2 when the sleeve 1 is in an expanded condition as shown in FIG. 2.

The over-all length of the sleeve 1 will generally run from 1 inch to 2 inches in length, the thickness of the flanges 2 will generally range from $\frac{1}{8}$ to $\frac{1}{4}$ inch and the thickness of the body of the sleeve will range from $\frac{1}{16}$ to $\frac{3}{16}$ inch. The sleeve and attendant flanges will be made of rubber, natural or synthetic, preferably a cured rubber compounded with a suitable reinforcing black to allow repeated expansion and contraction during the life of the sleeve.

The caps 4 and 5, the shaft adapter 7, and the motor shaft 12 may all be fabricated of any convenient materials, preferably metal. Ordinary steel has been successfully used for these parts.

I claim:

1. An expanding mandrel assembly comprising in combination a hollow, open-ended, cylindrical rubber sleeve having raised external flanges at each end thereof, a pair of supporting cylindrical caps having shoulders thereon adapted to receive said flanges, said shoulders having sufficient depth to form a gap between the outer edges of said flanges and the inner corresponding surfaces of said shoulders to allow said flanges to bend outwardly in the axial direction during expansion of said sleeve, the caps being mounted on the open ends of said sleeve to form airtight seals thereon, and means for admitting air under pressure into the sealed interior of said sleeve to cause said sleeve to expand, and supporting means for said caps and said expanded sleeve.

2. An assembly according to claim 1 in which said supporting means is adapted to rotate.

3. An assembly according to claim 2 wherein said supporting means for rotating said caps and said expanded sleeve comprises the shaft of an air motor.

4. An assembly according to claim 1 wherein one of said caps is supported by a transverse shaft adapter concentric in said sleeve.

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