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PROCESS OF MANUFACTURE OF SPINNERETS, PARTICULARLY FOR SPINNING AND EXTRUDING SYNTHETIC TEXTILES, AND A SPINNERET OBTAINED BY THIS PROCESS

Filed Feb. 19, 1962

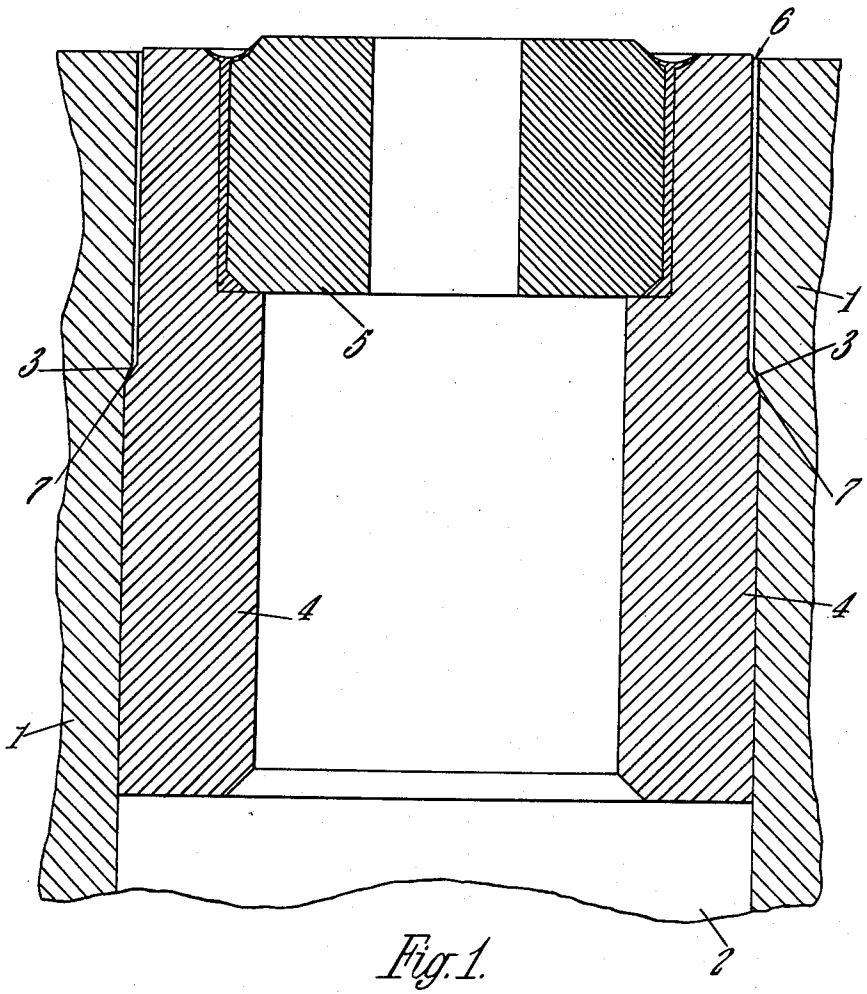


Fig. 1.

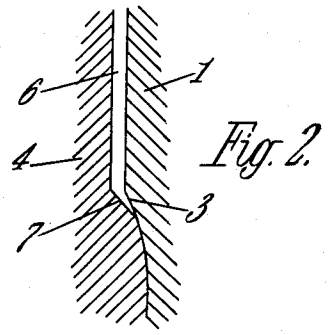


Fig. 2.

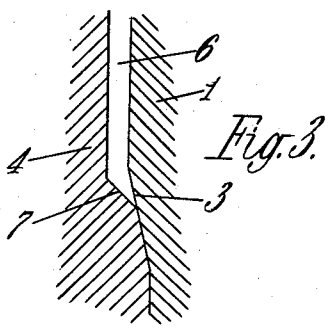


Fig. 3.

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PROCESS OF MANUFACTURE OF SPINNERETS, PARTICULARLY FOR SPINNING AND EXTRUDING SYNTHETIC TEXTILES, AND A SPINNERET OBTAINED BY THIS PROCESS

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1 Claim. (Cl. 29—401)

For the spinning and extrusion of synthetic textiles, particularly nylon, terylene, and the like, there is an ever increasing tendency to use spinnerets composed at least partially of hard, non-metallic substances such as rubies, ceramics, diamonds, etc., which will be designated hereinbelow by the general term "pierced stones," by analogy with those used in watchmaking. These pierced stones are generally permanently fixed in a metal mounting, for example driven or crimped in a tubular piece of stainless steel; spinnerets of this type nevertheless freqeuntly have the disadvantage of not being absolutely fluid-tight peripherally when the extrusion takes place at high temperature and pressure.

This invention aims at overcoming these disadvantages and relates to a process of manufacture of spinnerets comprising a pierced stone welded in a metal bezel; this process is characterized in that a cylindrical hole is pierced in a metal plate, a ball or a punch having a spherical or conical head of a diameter slightly larger than that of the hole is forced through from the inside face of the plate so as to increase partially the diameter of the hole and to provide at the end of the widened part an inclined, conical or concave annular shoulder, while from the inside face of the plate a metal bezel is driven into this socket, the pierced stone being welded in the said bezel.

One embodiment of the process forming the subject of the invention is illustrated by way of example in the accompanying drawings, in which:

FIGURE 1 is a partial section of the completely mounted spinneret,

FIGURE 2 is a partial section on a larger scale of a detail of the plate-bezel assembly, and

FIGURE 3 is a similar view of FIGURE 2 of another form of construction of this detail.

Referring to the drawings, a cylindrical hole 2 is pierced in a metal plate 1, which is for example of stainless steel. A ball of steel or a stamp having a spherical or conical head and of a diameter greater than the diameter of the hole is driven into the bottom part (that is to say the part at the bottom in the drawing), i.e. from the inside face of the spinneret, so as to widen the lower part of the said hole and to provide between this widened part and the upper part which is not widened an annular shoulder 3 which is inclined to an angle of 30 to 45°, and is concave (FIGURE 2) in the case of a ball or a punch having a spherical head, or conical (FIGURE 3) in the case of a punch having a conical head.

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By a process forming the subject of a conjoint application for patent, a bezel 4 of stainless steel, titanium, or zirconium, and in the upper end (that is to say the end at the top in the drawing) of which there is welded a pierced stone 5 (ruby, ceramic, diamond, etc.), has moreover been prepared. The diameter of the bottom part of the bezel 4 is at least equal to the diameter of the widened bottom part of the hole 2, while the top part of the bezel, in which is welded the pierced stone 5, has a smaller diameter so that between that part and the non-widened part of the hole 2 there is a minimum clearance 6 of 0.005 mm.

The bezel 4 has then merely to be driven by force from below (in the drawing) into the hole 2. A solid and prefectly fluid-tight joint is thus formed between the bezel and the plate 1, particularly at the point where the shoulder 3 is provided, the inclined concave or conical surface of which cooperates with the conical shoulder 7 having a greater inclination which is formed on the outside of the bezel 4 between its lower part and its upper part of smaller outside diameter. The clearance 6 mentioned above ensures that the pierced stone 5 will not be subjected to excessive pressure during the driving-in of the bezel 4.

In the resulting spinneret the bezel with its pierced stone welded thereto can easily be ejected from the outside when the pierced stone is accidentally damaged or its hole is worn, and replaced by another.

I claim:

A process of manufacture of spinnerets comprising a pierced stone welded in a metal bezel, comprising the steps of piercing a cylindrical hole in a metal plate, forcing a ball or a punch having a spherical or conical head of a diameter greater than that of the hole from the inside face of the plate into the said hole so as to widen partially the diameter thereof and to form at the end of the widened part an inclined annular shoulder, and thereafter driving by force a metal bezel, in which the pierced stone is welded and in which the outside diameter of the portion of the bezel which contains the welded stone is reduced so as to leave between the said portion and the unwidened portion of the hole in the plate a clearance of at least 0.005 mm. and so as to provide on the bezel an external annular shoulder from the inside face of the plate into this socket thereby forming a fluid tight joint particularly at the shoulder at the end of the widened part and at the shoulder of the bezel, and thereby providing a clearance between the remaining part of the hole and the portion of the bezel in which said stone is welded, whereby a worn or damaged stone may be replaced without damage to the new stone.

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