Dec. 5, 1944. G. W. NEESEN 2,364,383

PACKING

Filed Sept. 30, 1942

Fig. I.

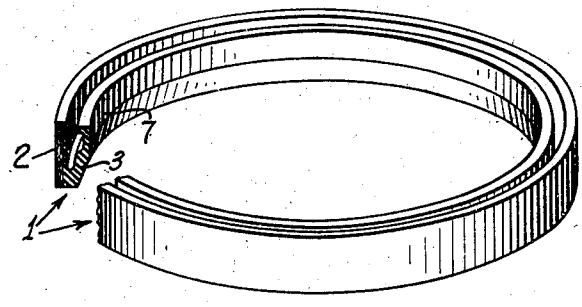


Fig. II.

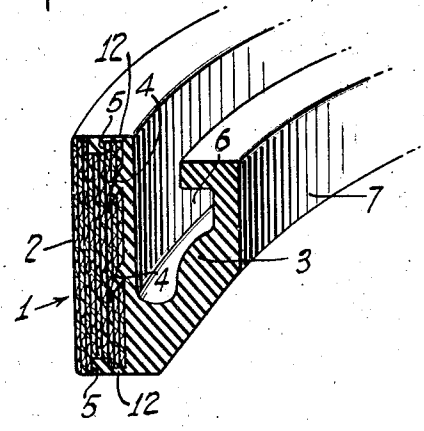


Fig. III.

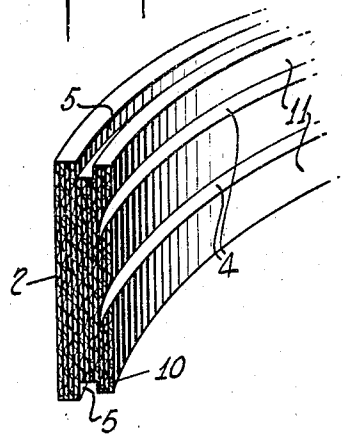
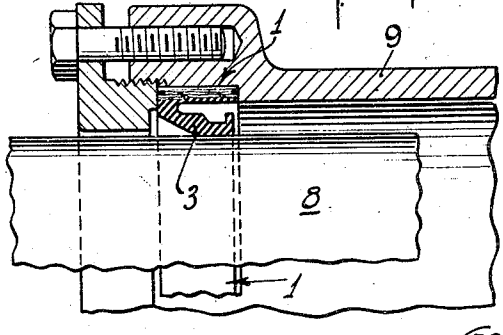


Fig. IV.



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PACKING

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Application September 30, 1942, Serial No. 460,206

3 Claims. (Cl. 288—5)

My present invention relates to packings, and particularly to a ring packing of improved type having a relatively rigid supporting annulus or heel and a relatively flexible lip for contacting a moving part, such as a rotating or reciprocating shaft.

A principal object of the invention is the provision of an improved ring packing of the type referred to in which the supporting annulus and the flexible lip are united by means which, in effect, welds them into a unitary structure while, at the same time, the essential individual characteristics of the annulus and lip are retained.

A more specific object of the invention is to provide a ring packing comprising a pre-formed, relatively rigid annulus including an impregnated fabric securely united to and supporting a relatively soft, flexible, resilient, and abrasion-resistant lip adapted to contact the moving part. A further object of the invention is the provision of such ring packing in which portions of the lip penetrate into and interlock with pre-formed recesses in the relatively rigid annulus.

My invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description thereof which is to follow and to the accompanying drawing, in which:

Fig. I is a perspective view of an embodiment of the invention with a portion broken away for purposes of illustration;

Fig. II is a sectional view on an enlarged scale taken through the ring of Fig. I;

Fig. III is an enlarged fragmentary, perspective view of a pre-formed supporting annulus; and

Fig. IV is a sectional view of a stuffing box assembly employing a packing ring of the instant invention.

Referring now to the drawing, and particularly to Figs. I to III, the ring packing 1, in accordance with the invention, comprises a relatively stiff and rigid supporting annulus or heel 2 forming a matrix for a flexible, relatively soft lip 3 adapted to contact the moving part, such as a rotating or reciprocating shaft. Referring particularly to Fig. III, the supporting annulus or heel 2 comprises a plurality of fabric layers which have been impregnated with, and united into a substantially integral structure by, a suitable binder, preferably a thermo-setting resin. For example, a resin such as Bakelite or other phenolic condensation product has been found to be particularly suitable for this purpose. The fabric may be of any conventional type employed for packing materials; for example, cotton or asbestos. The supporting ring or annulus 2 is provided with a plurality of annular grooves 4 in a forward face 11 and annular grooves 5 in upper and lower edge surfaces 12. Grooves 4 are preferably under-cut to enhance the interlocking action with the lip portion as will be understood from an examination of Figs. I and II. For similar reasons, the inner walls defining grooves 5 are preferably shorter than the outer walls. It will be appreciated, however, that the grooves or recesses 4 and 5 may take many different shapes and may be continuous or discontinuous as desired.

To form the annulus, the selected fabric, such as cotton or asbestos, is thoroughly impregnated with the binder; for example, the phenolic condensation product referred to above, as by coating, immersing, spraying, or the like, and the fabric is then dried. Strips of the impregnated fabric of the proper width are wrapped upon themselves around a mandrel until a suitable thickness is obtained. The ring or annulus thus formed is placed in a steel mould having die members of the proper size and shape to compress the ring to the form illustrated in Fig. III. The moulding operation is carried on at a suitable temperature, say from 320 to 335° F., and at a pressure, say, between 1400 and 1500 pounds per square inch. It will be understood that particularly the temperature employed during the moulding operation may be varied depending upon the setting characteristics of the resin used as a binder. During such moulding operation, the thermo-setting binder is reacted or set to the proper rigidity and hardness.

The lip portion of the packing illustrated generally at 3 is formed of a relatively soft material and suitably comprises an oil-resistant rubber composition such as a natural rubber or an artificial rubber such as Neoprene, or the like. Hereinafter the expression "rubber composition" will be used to refer to all such natural and artificial rubber compositions. The rubber composition, in an uncured state and in suitable quantity to form the lip portion 3, is applied to the interior surface of the annulus 2 in a finishing mould and subjected therein to pressure to mould the rubber compound into the configuration as shown in Fig. II and to fill locking grooves 4 and 5. As previously pointed out, grooves 5 in the annulus 2 are defined by inner walls shorter than the outer walls, whereby, during the moulding operation, the rubber composition is forced over the shorter walls into the grooves. In this way, the composition forms, in effect, a complete sheathing over the inner face 11 and portions of the end faces 12

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of the annulus 2. While the ring gasket is in the finishing mould, the rubber composition is cured for approximately one-half hour while subjected to a temperature of from 320 to 335° F. and a pressure of, say, 1250 pounds per square inch. The curing operation causes the rubber composition to completely set and to become substantially inseparably united to the annulus 2.

The ring packing, as shown in Fig. I, may include a recess 6 formed in the lip portion during the finish-moulding operation. When the packing is positioned in a stuffing box 9 (see Fig. IV), the fluid pressure exerted along shaft 8 will be directed into channel 6, and the contact surface 7 of lip 3 will be forced against the shaft or rod 8, and an effective seal thus insured. The groove or channel 6 may also support a tension member of any suitable or conventional type to supplement the action of the fluid pressure in maintaining surface 7 in sealing contact against the shaft 8.

It will be understood that, although a packing ring of the type which surrounds the moving part has been illustrated and described, the invention is equally applicable to other constructions. For example, the lip may be formed on the outer side of the supporting annulus to cooperate with a rotating or reciprocating sleeve, or the like.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to, but that various changes and modifications will suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. A ring packing comprising a preformed supporting heel including fabric layers impregnated and bonded with a hardened composition, said heel having annular grooves in a face thereof and a flexible lip comprising a hardened composition having integral ribs extending into and filling said grooves and united to said heel.

2. A ring packing comprising a preformed, annular, supporting heel including fabric layers impregnated and bonded with a hardened resin, said heel having annular, undercut grooves in an inner face thereof, and a flexible lip comprising a hardened, rubber composition having integral ribs extending into and interlocking in said grooves and united to said heel.

3. A ring packing comprising a preformed supporting heel including fabric layers impregnated and bonded with a hardened resin, said heel having an inner face including a plurality of annular grooves, locking grooves in the top and bottom edges of said heel, and a flexible lip comprising a yieldable rubber composition having integral ribs extending into and filling said grooves and united to said heel.

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