No. 648,687. Patented May 1, 1900.

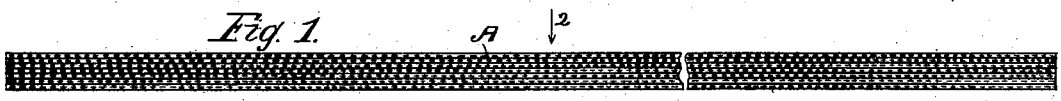
O. J. GARLOCK.

PACKING RING AND PROCESS OF FORMING IT.

(Application filed Feb. 26, 1900.)

(No Model.)

Fig. 1.



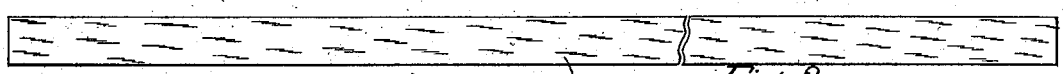


Fig. 2.

Fig. 6.

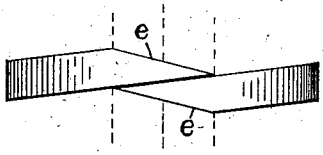


Fig. 7.

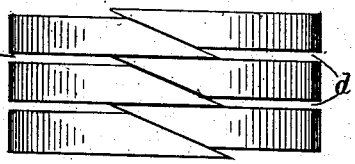


Fig. 5.

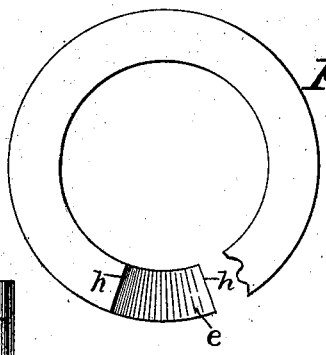
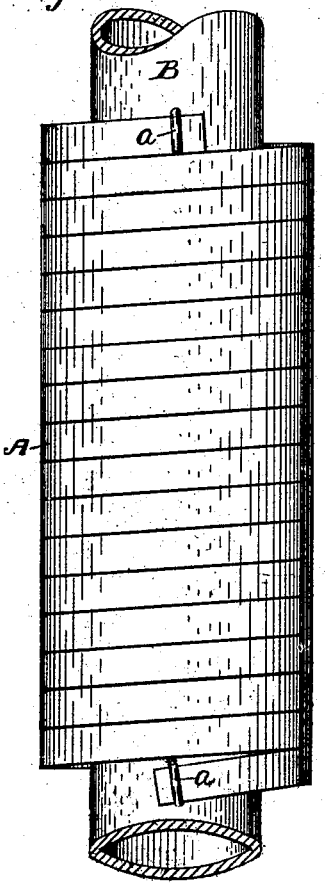


Fig. 3.



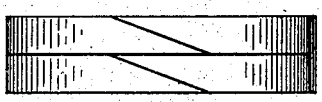
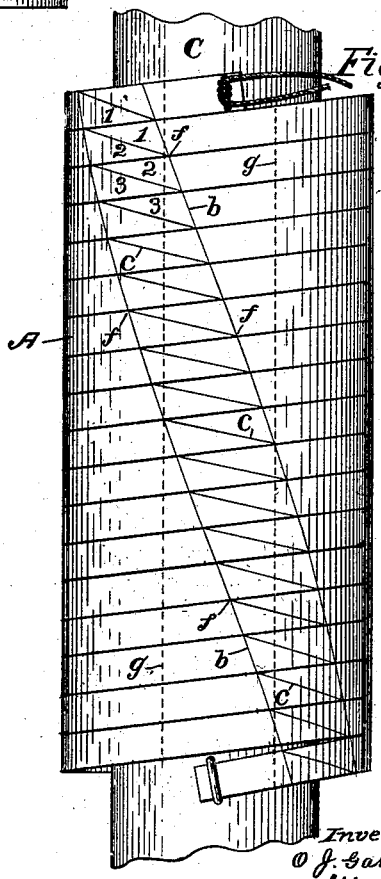


Fig. 8.

Fig. 4.



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UNITED STATES PATENT OFFICE.

OLIN J. GARLOCK, OF PALMYRA, NEW YORK, ASSIGNOR TO THE GARLOCK PACKING COMPANY, OF SAME PLACE.

PACKING-RING AND PROCESS OF FORMING IT.

SPECIFICATION forming part of Letters Patent No. 648,687, dated May 1, 1900.

Application filed February 26, 1900. Serial No. 6,635. (No model.)

To all whom it may concern:

Be it known that I, OLIN J. GARLOCK, of Palmyra, in the county of Wayne and State of New York, have invented a new and useful Improvement in Packing-Rings and Process of Forming Them, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention relates to packing-rings for piston or pump rods, and it also relates to the method or process of forming the rings, the same being hereinafter fully described, and more particularly pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification.

These packing-rings are formed from or out of strips of packing material in the manner hereinafter set forth, previously cut to size from sheets or slabs of the material, the latter being usually made up of alternate layers of india-rubber and canvas or other fibrous material.

Referring to the drawings, Figure 1 represents a cut surface of a strip of packing material. Fig. 2 is a side view of the same, seen as indicated by arrow 2 in Fig. 1. Fig. 3 shows the strip wound upon a mandrel ready to be treated. Fig. 4 represents the strip after being treated and placed upon a second mandrel to be marked and cut. Fig. 5 is a plan of a completed ring partly broken away. Fig. 6 shows a ring in crude form just removed from the cutting-mandrel. Figs. 7 and 8 show, respectively, rings improperly and properly cut to aid in illustrating the invention.

A strip A of the material out of which the rings are to be formed is cut to the proper size and first wound upon a mandrel B, Fig. 3, preferably of metal, which may be either hollow or solid. This strip is normally stiff and elastic and does not readily take to the curved form of the mandrel, force being required to wind it, and when in place upon the mandrel it is held by some simple means, as staples or holders *a a*, secured to the mandrel. When thus coiled on the mandrel, the strip is subjected to the action of heat of an intensity sufficient to set the strip in its coiled form and overcome the tendency for it to return to its original straight form. This heating or treatment of the coiled strip to form it or set it to a new shape may be effected in different ways, and my invention does not depend upon any special method, the object being primarily to set the material to spiral form, as shown, on the mandrel. Steam or hot water may, for example, be passed through the mandrel, or the latter, with the material wound thereon, may be boiled in a liquid, as found to be best. I usually prefer to boil the coiled strip while on the mandrel in oil with some antifriction material, as plumbago, held in suspension. Thus treated the material of the coil is softened, but its elasticity is not destroyed, for if removed from the mandrel and straightened it will tend to resume its new or spiral form. After being treated the coiled strip is removed from the mandrel, slightly opened out, and placed upon a second larger mandrel C, (preferably of wood,) having a diameter corresponding substantially with the internal diameter the rings are intended to have when completed.

While upon the second mandrel C, the strip is marked and each coil transversely cut obliquely across to form rings, as shown in Fig. 6, so the divided inclined ends *e e* of each ring may be made to meet and lap, as shown in Fig. 8. Before being cut into rings the coil is marked with parallel spiral lines *b b*, Fig. 4, to determine the two ends *f f* of the respective incisions which are made along the diagonal lines *c*.

The degree of the inclination or the spirality of the lines *b b* depends in part upon the diameter of the rings; but to properly cut the coil into single rings the lines *b b* must be more or less inclined or varied from truly longitudinal lines. The necessity of this will be clearly understood by referring to Figs. 6 to 8. The rings when first cut from the coil consist each of two parts or end portions 1 1, 2 2, 3 3, &c., each ring being primarily in the form shown in Fig. 6. Subsequently its ends are carried past each other to bring the slant surfaces *e e* contiguous, as shown in Fig. 8, the plane of the rings then being horizontal instead of spiral or inclined, as shown in Figs. 6 and 4. If the rings were cut with reference

to truly longitudinal lines—as the dotted lines *g g*, for example—that is to say, diagonally between those lines—they would be when finally formed, as shown in Fig. 8, too large in diameter. This is for the reason that the diameter of each ring is slightly increased when changed from the primary or crude form shown in Fig. 6 to the finished form shown in Fig. 8, and if the rings were thus cut each would need to be slightly compressed in diameter when placing it on the rod in the stuffing-box, which would cause the rings to overlap too far, as shown in Fig. 7, leaving spaces *d* between them. This would be objectionable and materially detract from the usefulness of the rings when placed in a stuffing-box for the purpose intended.

By drawing the lines *b b* in spiral form, as shown, and dividing the rings with reference to these lines the successive incisions or cuts gradually gain upon the coil, each being slightly in advance of the preceding one, on account of which the rings thus formed are slightly shortened, and when placed in a stuffing-box they fit and take the compact form shown in Fig. 8 without spaces between them.

The method of cutting these rings or the instrument used is not essential, care being only taken to have the lines *h h*, Fig. 5, marking the beginning and the end of the cut, about radial, as shown. The rings thus formed lap more favorably at their ends and act better under the pressure of the follower of the stuffing-box.

What I claim as my invention is—

1. The method of forming packing-rings, which consists in winding a strip of material about a mandrel, subjecting the same to a treatment to set the material while thus wound to its coiled form, and subsequently cutting the coiled strip upon lines disposed spirally of said coil, as set forth.

2. The method or process of forming packing-rings out of strips of packing material by first winding a strip on a mandrel, in spiral form, then subjecting it to the action of heat, and finally placing the coil upon a second mandrel of larger diameter and cross-cutting the coil disposed spirally with reference to said coil into rings, substantially as shown and set forth.

3. The process of forming packing-rings from strips of material, herein described, by winding a strip of the material upon a mandrel and cross-cutting it into rings, the cross-cuts being made with reference to spiral lines, substantially as shown and described.

4. The herein-described method of forming packing-rings, which consists in spirally winding a strip of material, setting the same in its coiled form, cutting the same into rings with their opposite faces in spiral planes and carrying the ends past each other to bring said faces into horizontal parallel planes, as set forth.

5. Packing-rings formed from coiled strips of packing material, in the manner described, cut diagonally across at their sides, said cuts being radial, the planes of said rings being turned from a spiral to a horizontal plane, substantially as shown.

In witness whereof I have hereunto set my hand, this 21st day of February, 1900, in the presence of two subscribing witnesses.

OLIN J. GARLOCK.

Witnesses:

ENOS B. WHITMORE,

M. L. WINSTON.