S. T. HIATT.

STUFFING BOX PACKING.

APPLICATION FILED NOV. 23, 1916.

1,277,072. Patented Aug. 27, 1918.

Fig. 1.

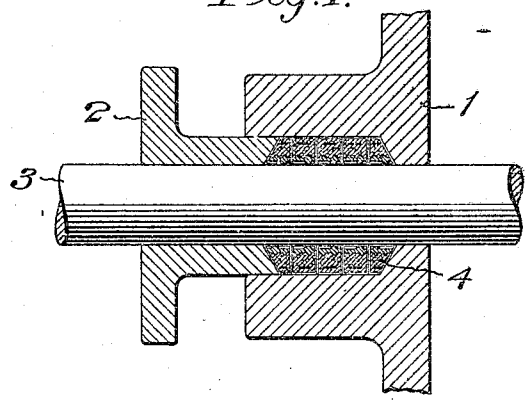


Fig. 2.

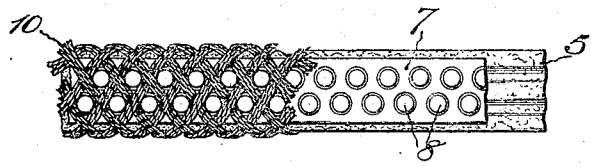


Fig. 3.

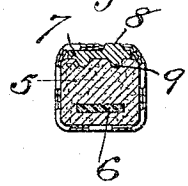


Fig. 4.

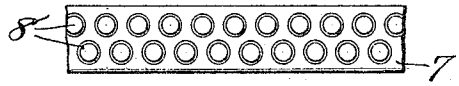


Fig. 5.

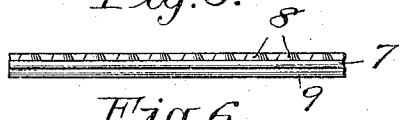


Fig. 6.

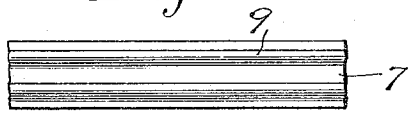
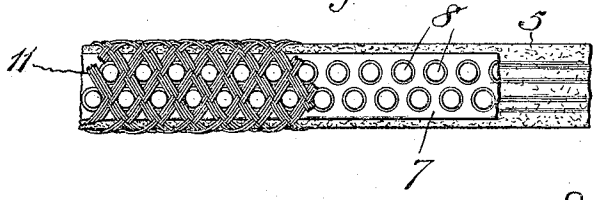


Fig. 7.



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UNITED STATES PATENT OFFICE.

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STUFFING-BOX PACKING.

1,277,072. Specification of Letters Patent. Patented Aug. 27, 1918.

Application filed November 23, 1916. Serial No. 133,010.

To all whom it may concern:

Be it known that I, STEPHEN T. HIATT, a citizen of the United States, and resident of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Stuffing-Box Packings, of which the following is a specification.

This invention relates to an improvement in stuffing-box packings, with the main object of providing such an article which combines, in a high capacity, the yielding and non-abrasive or scoring qualities of a fibrous packing with the anti-friction characteristic and longevity of metallic packing.

Another object is to provide such an article which is comparatively simple and cheap to manufacture and which may be sold by lineal measure, and utilized in the same manner as the ordinary and well known asbestos packing.

A further object is to provide certain improvements in the form, composition, construction and arrangement of the several elements of the packing, whereby the above mentioned and other inherent advantages may be effectively attained.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a detail longitudinal section through a conventional form of piston rod and stuffing-box, with my improved packing in place therein,

Fig. 2 represents a detail face view of the packing,

Fig. 3 represents a transverse section therethrough,

Fig. 4 represents a detail plan view of the metallic portion of the packing,

Fig. 5 represents an edge view of the same,

Fig. 6 represents a plan view reverse to Fig. 4, and

Fig. 7 represents a view similar to Fig. 2, but showing a slightly modified form.

In the preferred form shown in Figs. 1 to 6 inclusive, the stuffing-box is denoted by 1, the gland by 2, and the piston rod by 3. The packing is adapted to be confined in the stuffing-box in the ordinary manner, and it is represented in Fig. 1, in general, by the numeral 4.

The packing consists chiefly of two main elements, one of which is fibrous, and the other metallic. The fibrous element 5 preferably consists of a well known form of asbestos packing which is commonly sold in the form of a rope or strand, substantially rectangular in cross section. This well known commercial asbestos packing frequently contains a strip of rubber 6; but it will be understood that the presence or absence of this rubber portion is not an essential feature of my invention, nor is the particular nature of the fibrous element of my packing in general.

Before combining this fibrous element 5 in my composite packing, I find it desirable to somewhat compact the same by passing it through rollers under pressure, and, while so compacted, to lead it into a chamber containing about thirty-five or forty pounds of steam for the purpose of partially vulcanizing the same, and thus causing it to remain in its compressed or compacted condition. The vulcanization at the steam pressure stated may be continued for approximately thirty minutes.

The other chief element of the packing consists of a metallic strip 7 which may perhaps be best described as serving the purpose of an anti-friction metallic wearing surface of the packing. This metallic element 7 is preferably composed of some relatively soft material, such as Babbitt bearing metal, copper, brass, or other suitable alloy. When I say "relatively soft," I mean as compared with the material of which piston rods are normally composed, to wit, steel. Assuming this metal to be provided in strips or ribbon-like form, I then pass it between pressure rollers or other suitable mechanism for imparting certain irregularities to both faces thereof. In the preferred form, these irregularities consist, so far as the working face of the element 7 is concerned, of a number of small circular projecting knobs or excrescences 8 which may conveniently be ranged in two parallel rows, longitudinally

of the strip, and in staggered relationship. On the reverse side of the element 7, I prefer to form two longitudinal ribs 9.

While it will be clear that the precise form and arrangement of these excrescences and ribs does not constitute an essential feature of my invention, they are important in a general way inasmuch as they serve for the performance of substantially useful functions. The excrescences 8 initially break up the operative surface of the metallic element 7, and thus by reason also of the fact that they are relatively soft, enable this surface of the metallic element to conform itself precisely to the surface contour of the piston rod 3. This is highly important inasmuch as such piston rods are frequently scored or somewhat irregular as to their surfaces, by reason of long use or abuse, at the time new packing is inserted in the stuffing-box.

The ribs 9 act as means for unifying, to a certain extent, the fibrous and metallic elements of the packing, inasmuch as they gradually bite into the fibrous part until they become embedded therein, as clearly shown in Fig. 3. The fact that these ribs are longitudinally disposed with respect to the packing, and hence transversely with respect to the direction of movement of the piston rod, serves to most effectively prevent the disassociation of the metallic and fibrous elements from their firm union, as the result of the reciprocating movement of the piston rod.

In order to firmly combine the metallic and fibrous elements into a unitary packing, for the purposes of merchandizing and application, I find it advisable to bind the two elements firmly together so as to draw the ribs 9 of the metallic element into the fibrous element 5. For the purpose of this binding, I may use any kind of thread, either fibrous or metallic, and it may be applied in any convenient manner. I prefer, however, to use cotton thread and to braid it around the elements 5 and 7, as clearly shown at 10, in Fig. 2. This braiding may be accomplished by means of well known machinery designed for that purpose. The braided form of binding is very desirable, inasmuch as it permits the threads to lie between the excrescences 8, thereby causing them to firmly grip the metallic element 7 and also preventing them from being worn out at once by the action of the piston rod. By the time the thread 10 has been chafed through by the piston rod, the packing will be perfectly consolidated in its place and will have conformed itself precisely to the contour of the piston rod. At this stage it is unimportant whether or not the binding is intact.

The modified form shown in Fig. 7, is the same as the preferred form in all respects, except that that portion of the binding which engages the metallic element 7, is composed of metallic thread, such, for instance, as fine copper, lead, aluminum or brass wire, as clearly shown at 11. This increases the wearing qualities of the binding at this point, and the metallic threads also combine with the metallic element 7 to form a bearing surface.

Another feature of my invention which is of considerable importance, resides in the fact that the fibrous element 5 is wider than the metallic element 7, as clearly shown in Figs. 2 and 7. This extra width of the fibrous element permits the packing to be squeezed down by the gland 2, in the stuffing-box, without bringing the edges of the adjacent coils of the metallic element into contact. Thus space is left between the said coils of the metallic element for the expansion of the same while it is adjusting itself to the surface contour of the piston rod.

I believe that the foregoing description, when taken in connection with the drawings, which are attached hereto for the purpose of illustration, will serve to explain the construction, arrangement and mode of operation of my improved packing; but I may add that I have found, from actual experience, that this composite packing acts in a unitary manner so that the metallic element gets the benefit of the yielding and other advantageous characteristics of the fibrous element, while the latter receives the benefit of the close fitting, anti-friction and wearing qualities of the metallic element. The form of the elements and the manner in which I have associated them heighten these desirable features.

I desire it to be understood that various changes may be resorted to without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the details herein shown and described except as they may be specifically included in the claims.

What I claim is:

1. A composite stuffing-box packing comprising a substantially continuous fibrous element and a substantially continuous metallic element partially embedded in the said fibrous element, the said metallic element having its operative face provided with excrescences and its opposite face provided with projections embedded in the fibrous element, the said metallic element being temporarily bound to the said fibrous element.

2. A composite stuffing-box packing comprising a substantially continuous fibrous element and a substantially continuous metallic element partially embedded in the said fibrous element, the said metallic element having its operative face provided with excrescences and its opposite face provided with ribs embedded in the fibrous element,

the said metallic element being temporarily bound to the said fibrous element by thread.

3. A composite stuffing-box packing comprising a substantially continuous fibrous element and a substantially continuous metallic element partially embedded in the said fibrous element, the said metallic element having its operative face provided with excrescences and its opposite face provided with ribs embedded in the fibrous element, the said metallic element being temporarily bound to the said fibrous element by thread, that portion of the thread which engages the metallic element being composed of metal.

In testimony, that I claim the foregoing as my invention, I have signed my name this 21st day of November, 1916.

STEPHEN T. HIATT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."