

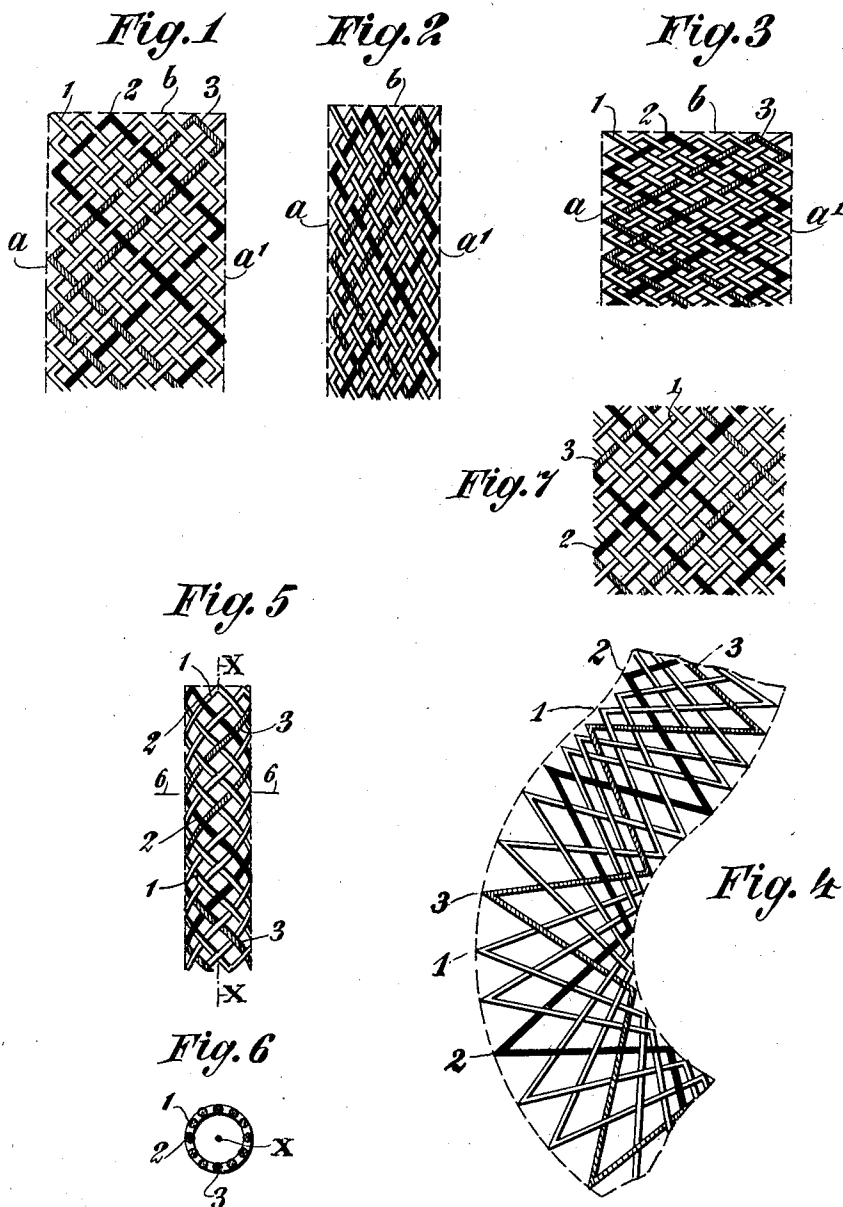
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PACKING MATERIAL

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PACKING MATERIAL

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My invention relates to packing materials for stuffing boxes and, more particularly, to such materials in sheet form.

Packing materials are made either loose or solid, the latter in various forms, including sheets and ribbons. The sheet or ribbon is closely woven, and the arrangement of the intermeshing strands is such that the material is devoid of all characteristics of mobility. The necessary give and take is, therefore, absent. On the other hand, a loose packing, while possessing the requisite mobility, is lacking in cohesion and can not be used without some form of retainer to hold it in place and to prevent its leaking through the indispensable clearance provided for the moving parts.

The present invention combines the advantages of both, the solid and the loose packing, without having the undesirable characteristics of either, and is suitable for use under the severest conditions. The main object is to provide a packing which possess the greatest possible mobility of its constituent elements while preserving their interconnecting means. Another object is to secure a packing which will readily adjust itself to changing or changeable conditions of an operating mechanism. Still another object is to provide a material which may be used either as a packing or as a gasket. Other objects will become apparent from the description which follows.

Referring to the drawings, Figure 1 is a plan view of a fabric embodying my invention, in sheet form. Figures 2 and 3 are, respectively, plan views of this fabric stretched in the longitudinal and in the transversal direction. Figure 4 is a partial plan view of the same fabric curved, as shown, to illustrate its use as a gasket. Figures 5 and 6 are, respectively, a top view and a cross section of a fabric made in accordance with my invention, in tubular form. Figure 7 is a plan view of a modified form of my invention.

In all cases, the fabric is a mesh composed of strands of a soft metal 1, such as lead, copper, tin or aluminum; strands 2, of a fibrous, fire proof or refractory material

such as, for instance, asbestos; and strands 3, of a yarn possessing the property of absorbing and holding a lubricant, such as flax, for example. The strands are spaced, as shown, and intermeshed at right angles to one another and at an angle of 45° to the border lines, a , a' , b , in the case of a sheet such as is illustrated in Figure 1. In the case of a tube, such as is illustrated in Figures 5 and 6, the strands form helices at each point of which the tangent to the helix makes an angle of 45° with the axis X—X of the tube. The strands are continuous. In the case of a sheet of ribbon (the fabric illustrated in Figure 1 may be considered to be a section of a ribbon, as well as a sheet), the strands are bent at an angle of 90° where they meet the border lines. In the case of a tube, no bending of this kind is needed. While, in the foregoing examples, the strands have been shown as being continuous, I do not limit myself to this structure, Figure 7 showing a structure wherein the strands are interrupted. The spacing of the strands must be sufficient to permit deformation of the sheet or tube in order to secure the necessary mobility of the constituent elements. I have found in the practice of my invention that a spacing equivalent to at least as much as the mean diameter of the strands gives all the mobility needed, but I do not wish to be limited to any particular dimension in this respect.

It will be seen that, owing to the above described construction, whether the fabric be in the form of a sheet, ribbon or tube, it may be extended and contracted. In the case of a tube, axial extension or contraction is accompanied, respectively, by a contraction or expansion of the cross section. In the case of a sheet or ribbon, the packing may be elongated, as illustrated in Figure 2, causing a corresponding contraction transversally, or pulled sidewise, as shown in Figure 3, causing a corresponding longitudinal contraction. The deformation of the fabric, made possible by my arrangement of the strands, endows it with a plasticity which can not be found in the woven fabrics of a standard packing, nor in the various existing forms of

solid packing. The plasticity of my packing is superior even to that of loose packings because of its uniform character, whereas the mobility of the particles of a loose packing is notoriously uneven and irregular. The mobility of the strands in my fabric enables one to effect a tight packing without thereby binding the shaft, rod, valve, or other mechanical element involved. It also permits the take up of any looseness that may develop in the packing in the course of time.

After the mesh is woven in the manner shown and described, it is placed in a vacuum tank and impregnated with a suitable lubricant, preferably, a mixture of oil or paraffine, or both, with graphite.

The selection of the metal for the mesh is dictated by the duty to be performed. Ordinarily, the metal selected is lead, but where high temperatures are involved copper replaces the lead. When the packing is exposed to the action of strong acids, aluminum may be substituted for the other metals. For lead, I have found a wire of .060" diameter to be most practicable. While a smaller diameter wire would increase the pliability of the fabric, the cost of drawing such small diameter wire would stand against its adoption in practice.

Excellent results have been obtained by me in making up the mesh fabric by using lead, flax, asbestos and a lubricant, in the following proportions: 150 parts metal, 1 to 3 parts flax, 6 to 10 parts asbestos, 12 to 20 parts oil, and 10 to 30 parts graphite, the latter depending on the grain, the proportion being greater for the finer and less for the coarser grain. These proportions are by weight. The same proportions give satisfactory results when copper is used instead of lead, except that the flax may be omitted in this case. When aluminum is used for the metal strands, I may add paraffine to the lubricant, with the following proportions of elements: 150 parts of aluminum, 10 to 16 parts asbestos, 25 to 35 parts paraffine, 10 to 30 parts oil, and 35 to 50 parts graphite.

The fabric described herein may also be used to form a gasket. Its pliability renders it particularly suitable for this purpose, as it readily adapts itself to all shapes. Such a gasket is illustrated in Figure 4. The gasket may be formed of a single sheet or ribbon, or of several superimposed layers, or of the tubular material shown in Figures 5 and 6, or, in general, in any manner familiar to those versed in the art.

I claim:

1. A packing fabric comprising loosely intermeshed, continuous strands of a soft metal and yarns inclined at an angle of forty five degrees to the longitudinal direction thereof.

2. A packing fabric consisting of a mesh of continuous strands of a soft metal, strands of a refractory material, and strands of a lubri-

cant absorbing yarn, inclined to the longitudinal direction of said fabric, impregnated with a lubricant.

3. A packing fabric comprising loosely intermeshed, continuous strands of a soft metal, asbestos, and flax, inclined at an angle of forty five degrees to the longitudinal direction thereof.

4. A packing consisting of loosely intermeshed strands of a soft metal, asbestos, and flax, in the proportions of from one to three parts flax and six to ten parts asbestos to one hundred and fifty parts metal, by weight, and a lubricant.

5. A packing such as described in claim 4, wherein the lubricant consists of from twelve to twenty parts of oil and from ten to thirty parts graphite, by weight.

6. A deformable sheet of packing material comprising continuous strands of soft metal and yarns loosely intermeshed diagonally to the border lines of said sheet.

7. A packing fabric in sheet form consisting of loosely intermeshed strands of lead, asbestos, and flax, inclined at an angle of forty five degrees to the borders of said fabric, and a lubricant.

8. A packing such as described in claim 7, wherein the lubricant consists of oil and graphite and the proportions of the elements are as follows: two parts flax, eight parts asbestos, sixteen parts oil, and twenty parts graphite, to one hundred and fifty parts lead, by weight.

9. A packing fabric of soft metal and fibrous material comprising a mesh of spaced, continuous strands inclined to the longitudinal direction thereof.

10. A packing material made of soft metal and a fibrous substance, in sheet form, comprising spaced, continuous strands disposed diagonally to the border lines of said sheet.

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