

July 31, 1951

W. M. DE WITT, SR

2,562,262

PACKING

Filed Jan. 26, 1946

Fig. 1.

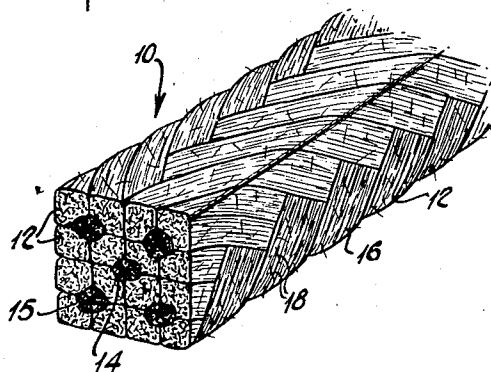


Fig. 2.

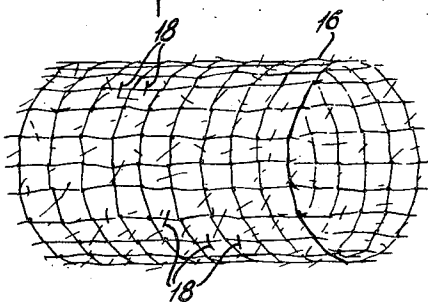


Fig. 3.

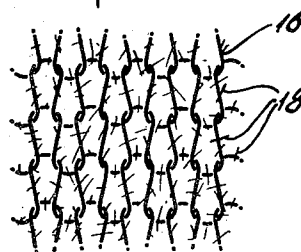
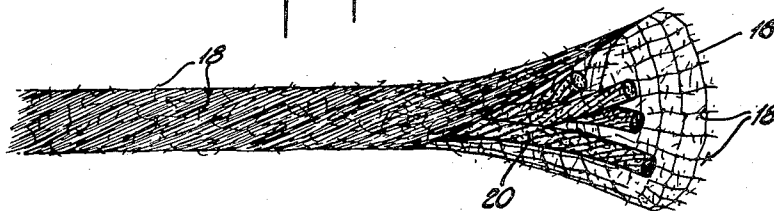


Fig. 4.



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2,562,262

PACKING

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Application January 26, 1946, Serial No. 643,717

3 Claims. (Cl. 288-2)

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The present invention relates to improved packings and, more particularly, to improvements in packings embodying a knitted, metal mesh or fabric as a major constituent.

Heretofore packings have been made comprising one or more cords formed of resilient, knitted, corrosion-resistant, metal fabric composed of relatively thin, flat, narrow, metal ribbons. The knitted metal mesh, suitably of tubular form, is compacted into a cord, preferably by twisting, and a plurality of the cords are braided or otherwise assembled together to form the packing. The packing preferably contains a sealing media which may be of different types, depending upon the purpose for which the packing is to be employed. For example, in certain applications where high temperatures are encountered, such sealing media has taken the form of a fibrous core strand around which the metal mesh is twisted or otherwise compacted, the core strand, preferably an asbestos wicking or roving, sealing the mesh of the fabric.

The instant invention has for its principal object the provision of a packing for high temperature uses, for example, as an expansion joint packing for locomotives and the like, the packing embodying an improved form and arrangement of sealing media.

Another object of the invention is the provision of a packing including inter-related or inter-braided cords of compacted metal mesh, the cords carrying a sealing material, particularly loose fibers, distributed over, and preferably adhered to, the mesh. The knitted mesh may be twisted or otherwise compacted around a reinforcing core consisting, for example, of a number of asbestos strands twisted together into a cord. The packing also preferably contains stuffer cords or strands of similar composition to such cores. The invention provides a packing which is capable of long wear but which, at the same time, provides an efficient seal against leakage under conditions of high temperature and pressure.

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 of a preferred embodiment of the invention which is to follow and to the accompanying drawing in which:

Fig. 1 is a perspective view of a section of packing embodying the invention;

Fig. 2 is a diagrammatic view on an enlarged scale illustrating the metal mesh employed as the primary constituent of the packing cords with the sealing material carried thereby;

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Fig. 3 is a diagrammatic view on an enlarged scale showing a section of the metal mesh and the sealing material thereon, and

Fig. 4 is a diagrammatic view illustrating a cord formed of the metal mesh fabric.

Referring now to the drawings, there is shown a packing 10 embodying the invention and formed of a plurality of inter-related cords 12 formed primarily of a knitted, corrosion-resistant, metal mesh fabric. The several cords 12 are inter-related or associated together preferably with additional stuffer cords, such as reinforcing core 14 and corner reinforcing cords 15. The core and corner cords comprise a number of asbestos yarns suitably wire reinforced in a conventional manner and twisted together into cord form. The wire reinforcement may be of the same metal used for the knitted mesh. The packing is fabricated preferably by a braiding operation, as illustrated, and the braid is molded or compressed into the desired cross-sectional configuration of the completed packing.

Cords 12, illustrated particularly in Figs. 2, 3 and 4, comprise strips of metal mesh fabric 16 knitted from thin, flat, narrow, metallic strands of, preferably, a corrosion-resistant, metal or metal alloy, such as copper, aluminum or nickel steel. In certain instances a softer metal or metal alloy may be employed, such as lead, bab-bitt or the like, but where a relatively high degree of resilience is desired as is generally the case, the harder metals are particularly applicable. A preferred material for the uses referred to above is copper, although alloys such as "Inconel" or Monel metal may be used. The individual, flat, metal strands are fabricated into mesh on knitting equipment of any suitable type such, for example, as a circular knitting machine, to provide a continuous, tubular fabric, as shown in Fig. 2.

The knitted metal mesh carries a distributed, fibrous sealing material 18, particularly loose asbestos fiber, in such quantities that when the mesh is compacted as by twisting, the fibers form a barrier to the passage of gases or other fluids through the compacted cord without, however, destroying the resilient characteristics of the cord. Fibrous sealing material 18 is suitably initially adhered to the metal mesh by a tacky adhesive as, for example, a rubber cement or the like.

In the preferred embodiment each cord 12 contains a core 20 comprising a plurality of strands of wire reinforced asbestos yarn, suitably of similar type to that employed for cords

14 and 15. The strands are twisted together to form the core 20 and the knitted mesh is twisted around the core, preferably in a direction opposite that of the twist of the core. The core serves as a reinforcing and stretch limiting element for the mesh cords.

In the manufacture of a packing in accordance with the invention, the knitted mesh, preferably of tubular form as previously pointed out, is flattened and fed from a supply thereof through a bath of a suitable adhesive or tacky substance, preferably of the type of rubber cement, for example, a butyl rubber cut back in gasoline or other solvent. After draining and drying, the mesh has loose asbestos fiber deposited thereon, the fiber preferably being intermixed with powdered graphite in proportions, say, of 63% asbestos fiber and 37% powdered graphite. The fibers and graphite are retained by the tacky adhesive. The tubular mesh with the distributed fiber is then fed through a condensing die and to a twisting device of any conventional construction, whereby the fabric is compacted or twisted into cord form. Stuffer cords 14 and 15 and core 20 are preferably coated with graphite. The cords are first treated with a lubricant, preferably a lubricating oil in which there is a small percentage of butyl rubber. In addition to its lubricating function the oil serves as an adhesive to retain the powdered graphite. Core 20 is fed to the flattened, tubular fabric prior to the twisting operation, as indicated in Fig. 4, and passes therewith through the twister to constitute a central reinforcing strand in the compacted cord. A plurality of the cords 12 are associated, preferably by braiding, to form the packing, cords 14 and 15 being incorporated in the braid as core and corner strands respectively. The braid is subjected to a pressing or molding action to achieve the desired packing shape as, for example, that shown in Fig. 1.

A packing of the type described above operates successfully under high temperature conditions. The loose asbestos fibers distributed throughout the compacted cords adequately seal the packing against the passage of fluid. Inasmuch as, during the twisting or other compacting step the fiber is intimately bound into the mesh, it will not blow out or otherwise become displaced.

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 may 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 packing comprising a plurality of inter-related, twisted cords formed of resilient fabric knitted from metal strands, said fabric having a fibrous material in loose fiber form distributed thereover, and the fabric thereafter twisted into the cord form to intimately bind the fibers into the mesh of the fabric and lock them against displacement between inter-engaging strands of the fabric.

2. A packing comprising a plurality of inter-related, twisted cords formed of resilient fabric knitted from metal strands, said fabric having asbestos fibers distributed thereover, and the fabric thereafter twisted into the cord form to intimately bind the fibers into the mesh of the fabric and lock them against displacement between inter-engaging strands of the fabric.

3. A packing comprising a plurality of inter-related, twisted cords formed of resilient fabric knitted from metal strands, said fabric having asbestos fibers distributed thereover and adhered thereto, and the fabric thereafter twisted into the cord form to intimately bind the fibers into the mesh of the fabric and lock them against displacement between inter-engaging strands of the fabric.

WALTER M. DE WITT, Sr.

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Certificate of Correction

Patent No. 2,562,262

July 31, 1951

WALTER M. DE WITT, SR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 3, line 48, after "mesh" and before the comma insert *between interengaging strands of the fabric*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of October, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.