Sept. 21, 1943. R. B. KINGMAN 2,329,994

FLEXIBLE PACKING MATERIAL

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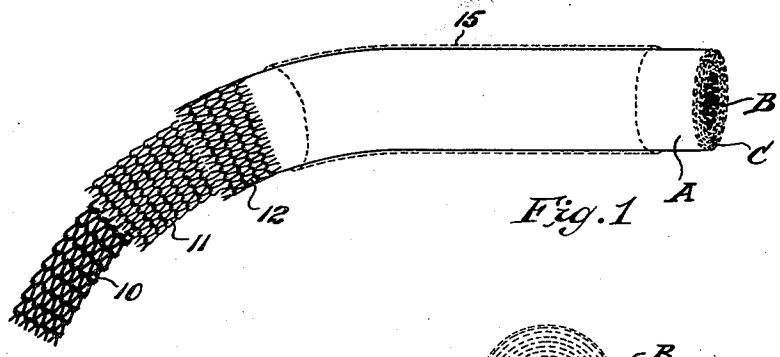


Fig. 1

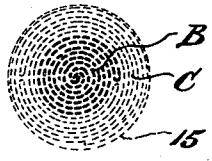


Fig. 2

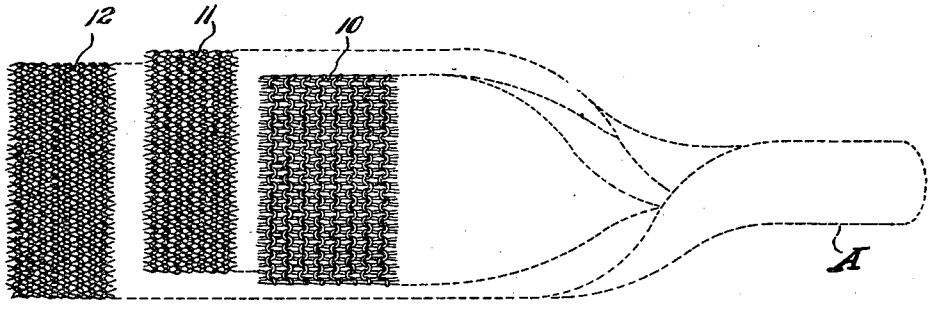


Fig. 3

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FLEXIBLE PACKING MATERIAL

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2 Claims. (Cl. 288—11)

This invention relates to improvements in packing material of the general type and kind disclosed in United States Letters Patent to A. M. Goodloe No. 2,250,863, wherein is disclosed a body of indeterminate length and suitable cross-sectional shape formed from knitted metallic fabric, and characterized by the possession of a high degree of flexibility along its longitudinal axis.

In packing material of the type to which this invention relates, it is desirable the body formation be such that the same is adequately resistant to transverse crushing pressure, and yet sufficiently resilient to readily conform to surfaces against or between which the material is arranged and compressed for packing effect. In the study of packing material of the kind here involved, I have noted that, when made of rovings or convolved sections or layers of knitted metallic mesh of uniform wire or ribbon size, weight and grade throughout, the desired resiliency factor is not altogether satisfactory, especially under heavy loads or pressure, and that the material tends to too densely pack under compression without sufficient recovery to assure uniform sealing contact with the surfaces engaged, especially when such surfaces begin to wear in use.

Having these things in mind, it is an object of this invention to provide an improved body structure in the make-up of packing material of the kind referred to, whereby the factor of inherent resiliency is greatly increased, and yet the contacting sealing surface of the material maintained sufficiently dense for good sealing effect. To this end, the present invention comprises a packing material made of graded metallic mesh sections or layers wrought into the desired cable-like formation, for use as is, or adapted to be braided into an ultimate packing body of desired cross-sectional shape; wherein a center core or section is provided which is formed of knitted relatively hard metallic wire or ribbon of comparatively coarse or heavy gauge and around which and enclosing the same are applied a peripheral section comprising layer or layers of knitted comparatively soft metallic wire or ribbon of relatively fine or small gauge. In such composite structure, the comparatively hard and coarse or heavy wire mesh core will provide an internal cushion of relatively high resiliency factor, in support of the peripheral layer or layers of relatively soft and fine wire mesh which is best adapted for sealing contact with the surfaces against which the material is engaged for packing effect.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of the novel packing material made of knitted metallic mesh is shown in the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevation of the flexible cable-like packing body, peripheral layers being broken away to show a portion of the internal cushioning core portion thereof; Fig. 2 is a schematic cross-sectional view of the body, drawn on an enlarged scale; and Fig. 3 is a fragmentary elevational view with portions of the core forming and peripheral section forming metallic mesh layers opened out to show their comparative characteristics.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

The packing body A according to this invention is made up from strips of knitted metallic wire fabric of desired length and suitable width. The strips preferably comprise tubular knit metallic wire fabric members which are flattened to form double ply strips, although it will be obvious that flat or warp knit single ply strips may be optionally used. A plurality of said strips, varying in number according to the diametric size of packing body to be produced, are used.

For the purpose of illustration, one or more mesh strips 10, knitted from comparatively hard and coarse or heavy wire, being rolled laterally to form a center cushioning member or core B, upon which one or more successively applied overlying strips, e. g. 11 and 12, knitted from relatively soft and fine wire, are convolutely superimposed to form an external or peripheral section C. The latter strips are laterally rolled or wound tightly about the core B and upon one another until the body A is built up to a desired diameter in cross-section. The knitted loops of the thus assembled core and peripheral section forming strips are all disposed parallel to the longitudinal axis of the resultant body, thus permitting relative sliding action between adjacent or interlinking knitted loops of the mesh, whereby the longitudinal flexibility of the resultant body is assured without tendency to substantially alter or deform the uniformity of the cross-sectional shape of the body; all in the manner and according to principles fully disclosed in the above-mentioned Patent 2,250,863 to Goodloe.

Since the center core B is formed from strip or strips knitted from comparatively hard and

coarse or heavy metallic wire or ribbon, the resultant body thereof will possess a high factor of resiliency, so that a highly efficient cushioning support of the peripheral section C is assured, whereby, in use of the packing, said peripheral section C will be yieldably pressed outward in very close hugging conformity to a surface with which the packing is operatively engaged in use; and since the peripheral section C comprises a fine and comparatively soft mesh, the desired sealing of its contact with the surface engaged is obtained.

In practice the loop or mesh size of the peripheral section forming strip or strips is preferably very small, so as to provide a substantial degree of density, as is desirable for sealing effect; whereas, the loop or mesh size of the core forming strip or strips is comparatively large, and consequently a somewhat more openly porous structure is formed at the center of the packing body, thereby providing the latter with a maximum storage capacity for a suitable lubricating agent, such e. g. as oil, grease or graphite, which, when charged thereinto, will be served outwardly therefrom to and through the peripheral section C of the packing body to the surface engaged by the latter when the same is in use.

In the make-up of a packing body, characterized in accordance with the principles of this invention, the metallic mesh strips composing either the core B or peripheral section C or both may be of composite character, i. e. the metallic mesh fabric may have incorporated therewith absorbent material, such as a textile yarn interknitted together with the knitted metallic wire, as heretofore disclosed in the copending application of Alfred M. Goodloe, Ser. No. 384,029, filed March 19, 1941, or absorbent material interlaid with the metallic mesh strips, as heretofore disclosed in the above referred to Goodloe Patent No. 2,250,863.

If desired the convolved flexible body A may be enclosed in an external tubular sheath or cover 15, which may comprise a tubular knit sleeve of metallic wire or a composite of metallic wire and textile strands; such sheath being shown in broken line outline in Figs. 1 and 2.

For some forms of packing structure, a plurality of the bodies A may be braided together into a single body of large cross-sectional mass and of suitable cross-sectional shape in the typical manner disclosed in the copending application for patent by Alfred M. Goodloe, Ser. No. 384,029, filed March 19, 1941.

Having now described my invention, I claim:

1. A longitudinal flexible packing body comprising knitted metallic wire fabric arranged in laterally convolved superposed layers, wherein the interengaged knit loops of the fabric lie parallel to the longitudinal axis of the body so that sliding play is permitted between longitudinally adjoined loops toward and from each other, interior layers of said metallic fabric being knitted from comparatively heavy or coarse metallic wire or ribbon to form an internal uniformly foraminous cushioning core of substantial compressible resiliency, and outer layers of said metallic fabric being knitted from relatively light or fine metallic wire or ribbon to provide a peripheral section for sealing effect.

2. A longitudinal flexible packing body comprising knitted metallic wire fabric arranged in laterally convolved superposed layers, wherein the interengaged knit loops of the fabric lie parallel to the longitudinal axis of the body so that sliding play is permitted between longitudinally adjoined loops toward and from each other, interior layers of said metallic fabric being knitted from comparatively heavy or coarse and hard metallic wire or ribbon to form an internal uniformly foraminous cushioning core of substantial compressible resiliency, and outer layers of said metallic fabric being knitted from relatively light or fine metallic wire or ribbon to provide a peripheral section for sealing effect, said peripheral section forming layers being of closely knit mesh but said core forming layers being of comparatively large mesh size, whereby the core is more openly porous to provide a major internal lubricant holding capacity.

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