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W. M. DE WITT

FLAT GASKET AND PROCESS OF MAKING SAME

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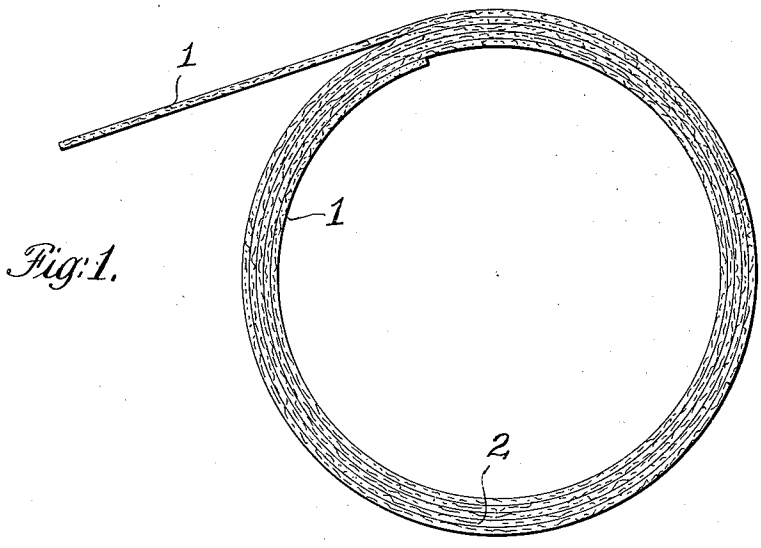


Fig: 1.

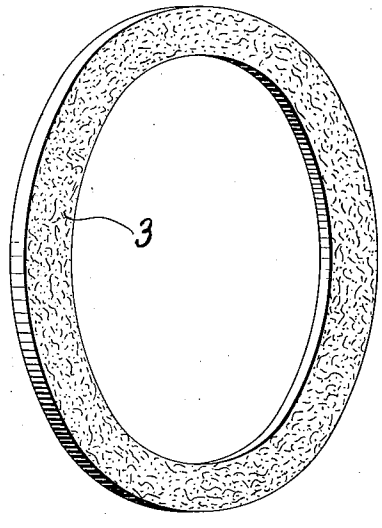


Fig: 2.

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UNITED STATES PATENT OFFICE.

WALTER M. DE WITT, OF SOMERVILLE, NEW JERSEY, ASSIGNOR TO JOHNS-MANVILLE, INCORPORATED, A CORPORATION OF NEW YORK.

FLAT GASKET AND PROCESS OF MAKING SAME.

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To all whom it may concern:

Be it known that I, WALTER M. DE WITT, a citizen of the United States of America, residing at 374 East Main Street, Somerville, in Somerset County, State of New Jersey, have invented certain new and useful Improvements in Flat Gaskets and Processes of Making Same, of which the following is a specification.

My invention relates to the formation of gaskets by the process of winding up a sheet of material on a mandril to form a tube of proper thickness and then cutting such tube into sections to form flat rings of the thickness desired for the gaskets, and comprises certain improvements on such old process and the gaskets heretofore produced thereby. As heretofore practiced the described process has consisted in the winding up of a textile fabric or sheet of paper or other similar fabric, which produces a cylinder having stratified walls, the separate sheets being more or less insecurely held together by a cement interposed between the successive, sharply defined strata. When such cylinder is cut across to form the rings which compose the separate gaskets, each such gasket consists of a coil of narrow tape, the adjacent surfaces of the tape coils being more or less insecurely cemented together. When such gasket is put into use, it is subjected to compression at right angles to the plane of the ring, the direction of pressure being, of course, parallel to the surfaces of the tape composing the gasket, with the result that there is a tendency for these coils of fabric to buckle and separate, thereby beginning the disintegration of the gasket, which disintegration is soon completely accomplished by the passage of the fluid under pressure through the openings so made.

According to my invention this difficulty is overcome while the ease and economy of manufacture by the winding process are preserved. This result is accomplished by substituting for the textile fabric or other similar fabric heretofore used, a sheet of plastic material or semi-plastic material, with the result that when such sheet or fabric is wound upon the mandril the various coils coalesce and form a homogeneous, integral body, and when the gasket is submitted to pressure in use, this coalescing of the several coils is completed by such pressure instead of the gasket being initially disintegrated as occurs in the prior art structure above referred to.

While plastic or semi-plastic sheets of different compositions can be employed in carrying out the broad principle of my invention, I prefer to proceed as follows:

I form a mixture of fibred asbestos, any suitable inorganic pulverized filler and substantially pure rubber, in the presence of gasoline to dissolve the rubber, and form this plastic mass into a sheet by feeding it between two rolls rotating together at a suitable distance apart, one of which rolls is internally heated as by admitting steam therethrough, while the other is preferably cooled by passing cold water therethrough. The described material adheres to the heated roll, but not to the cold roll and consequently is soon wound up on the heated roll in a layer of the desired thickness, the space between the rolls gradually increasing as the material accumulates either by reason of the yielding of springs which force the rolls together or by a gradual positive shifting of the bearings of one roll away from those of the other by means of a suitable mechanism. This machine is one known in the art and constitutes no part of my present invention, and, therefore, does not need further description or illustration. When a coating of the desired thickness is obtained on the heated roll the machine is stopped and the cylindrical coating is slit lengthwise of the roll and removed therefrom, the result being a sheet of this semi-plastic material, one of the superficial dimensions of which is the length of the roll while the other is the circumference thereof.

The sheet so formed is then wound upon a mandril the diameter of which equals the inside diameter of the desired gaskets and this winding is continued until a tube is formed having a thickness of wall equal to the width of the desired gasket. Preferably during this winding operation rubber cement is applied to the surface of the sheet to further insure the initial adhesion of the successive coils one to another. But if the sheet is sufficiently soft this cement may be dispensed with. The winding tension with or without the assistance of the rubber cement causes successive coils to coalesce each with the other so as to form a practically

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homogeneous body. When the tube is completed it is cut into rings in the usual manner, thus producing the desired gaskets.

In the annexed drawings which illustrate this step of my invention,

Fig. 1 is an end view of the tube in process of formation by the winding operation, and

Fig. 2 is a perspective view of one of the completed gaskets.

Throughout the drawings like reference characters indicate like parts.

1 is the sheet of semi-plastic material. 2 the tube formed therefrom, and 3 one of the gaskets formed by cutting said tube along planes perpendicular to its axis.

It is evident that as the plastic material is drawn in between the rolls by which the sheet is formed, there will be a tendency to drag the fibres of asbestos out into positions approximating parallelism with the circumference of the tube, and that accordingly when the gaskets are cut from said tube there will be a general arrangement of these fibres extending approximately circumferentially of the gasket, as indicated in Fig. 2, and this arrangement of the fibres adds strength and coherence to the gasket.

The result of my operation is a gasket of homogeneous structure of more uniform and dense structure than would have been produced if the original plastic material had been formed into a gasket by an ordinary molding process. Moreover, the gaskets so produced are of more uniform thickness than were they formed by molding, and there is practically no waste of the material.

It is evident that other plastic compositions than that described in the preferred form of my invention might be used as the starting material, and that the desired sheet of such material might be formed by other processes than the molding of the same upon a hot roll as above described, so long as the resultant sheet had the desired semi-plasticity rendering it capable of coalescing upon itself when wound upon the mandril to form the homogeneous tube having non-stratified walls, the formation of which constitutes an essential step in carrying out my invention.

If it is desired to produce an elliptical gasket the circular form shown in Fig. 2 may be stretched to an elliptical shape, or the gasket may be given this elliptical shape originally by cutting the tube along planes inclined to the axis thereof instead of at right angles thereto.

It is evident also that the elliptical gasket could be produced by winding the sheet of material 1 upon a mandril having the desired elliptical cross-section.

Having described my invention, I claim:

1. The process of forming flat gaskets which consists of the following steps: first, forming a sheet of asbestos fibres, pulverized inorganic filler and rubber intimately mixed by winding said material on a heated roll under pressure; second, winding said sheet on a mandril with a film of rubber cement between the coils into a homogeneous, substantially non-stratified mass; and, third, cutting the cylinder so formed into rings each of a thickness corresponding to that of the desired gasket.

2. The process of forming flat gaskets which comprises the following steps: forming a sheet composed of fibre, suitable pulverized filling material and cementing material, winding said sheet upon itself around a mandril while its surfaces are in an adhesive condition so that the superposed coils may merge in an integral homogeneous mass, and, finally, cutting the cylinder so formed into ring sections to produce gaskets of the desired thickness.

3. The product of the herein described process, being a flat gasket composed of a solid, homogeneous, substantially non-stratified mass of rubber, asbestos fibre and inorganic filler, in which the fibres are arranged approximately circumferentially of the gasket.

4. A product of the herein described process, being a flat gasket formed of a solid, homogeneous, substantially non-stratified mass derived from a sheet of semi-plastic material wound upon itself, each successive coil thereof being coalesced to its adjacent coils.

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