106-82. XR 2,040,348 EX Reference Examiner

167

May 12, 1936. J. H. VICTOR ET AL 2,040,348

SATURATED ASBESTOS SHEET FOR GASKETS AND PACKING

Filed Feb. 21, 1934

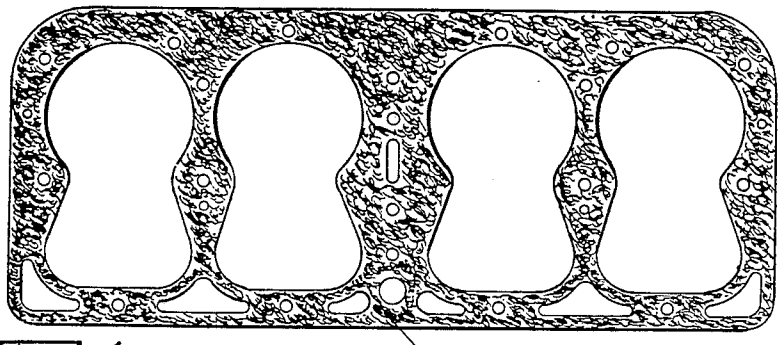


FIG. 1

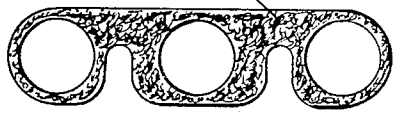


FIG. 2

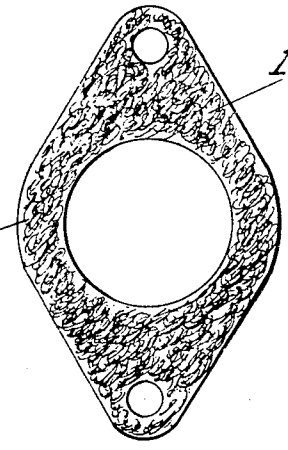


FIG. 3

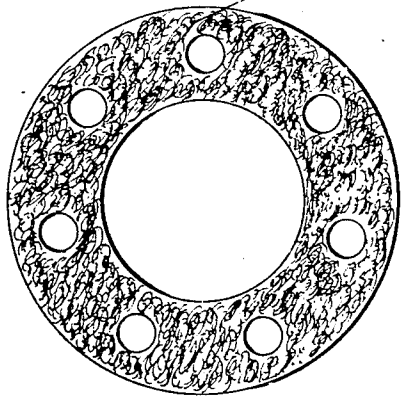


FIG. 4



FIG. 6

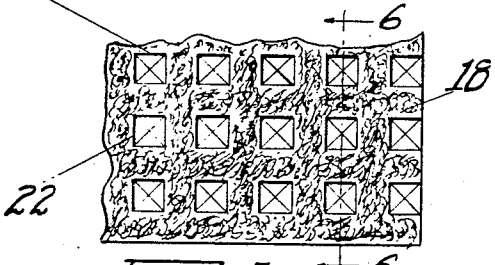


FIG. 5

JOHN H. VICTOR
BENJAMIN J. VICTOR
WILLIAM A. HEINZE
INVENTORS

PER Albert J. Fihe

ATTORNEY

Published by AsbestosClaims.Law
asbestosclaims.law/library/23605/1

Patented May 12, 1936 2,040,348

UNITED STATES PATENT OFFICE

2,040,348

SATURATED ASBESTOS SHEET FOR GASKETS AND PACKING

John H. Victor, Wilmette, Benjamin J. Victor, Oak Park, and William A. Heinze, Chicago, Ill., assignors to Victor Manufacturing & Gasket Company, Chicago, Ill., a corporation of Illinois

Application February 21, 1934, Serial No. 712,378

2 Claims. (Cl. 91—70)

This invention relates to an improved saturated asbestos sheet for gaskets and packing, and has for one of its principal objects the provision of a process of treating asbestos millboard or the like so as to render the same available for use as a cylinder head or similar gasket.

One of the important objects of this invention is the use of certain vegetable, marine or menhaden oils of the drying or semi-drying type or combinations thereof with or without the use of rosin, rosin esters, or resins, natural or synthetic, incorporated in liquid or solid form into a sheet of asbestos millboard or like material or incorporated into asbestos pulp from which the sheet or gasket may be formed.

Another important object of the invention is the provision of an improved process of manufacturing and producing a sheet of treated asbestos from which gaskets of various types can be die-cut or otherwise shaped and which sheet is immediately ready for use as a gasket without the addition of any other material such as reinforcing strips of metal or the like either inside or outside the same.

Another and still further important object of the invention is the provision of a gasket composed of a saturated sheet of asbestos which shall be water, oil and heat resistant, and which, furthermore, shall be proof against sticking to either the cylinder head or block or other metal portions if removal becomes necessary, or desirable.

Another object is to provide a method of making gaskets or the like from asbestos pulp compounded with suitable oils, resins and the like and molded in sticks which can then be later cut into shapes, lengths or thicknesses as desired.

A further object is to provide a sheet of gasket material such as asbestos or the like impregnated with a non-adhesive composition which shall render the same impervious to water, gasoline, oils, anti-freeze solutions and the like, and which further shall be proof against the action of heat and flame while at the same time possessing a greater resiliency and toughness and wherein the fibers are more definitely united and held together whereby a highly desirable and quite economical gasket results.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawing and following specification.

The invention, in a preferred form, is illustrated in the drawing and hereinafter more fully described.

In the drawing:

Figure 1 is a plan view of a typical cylinder head gasket shaped, die-cut or otherwise formed from the improved saturated and treated asbestos sheet of this invention.

Figure 2 is a plan view of typical manifold gasket used in internal combustion engines and which may be cut from the improved product of this invention.

Figure 3 shows a carbureter gasket formed from the improved saturated asbestos sheet of the invention.

Figure 4 shows still another type of gasket formed from the improved sheet of this invention, the same being a typical gasket used in steam and air-line connections.

Figure 5 is a plan view of a sheet from which the gaskets of this invention are formed, showing the sheet preliminarily treated to provide a special cushion surface.

Figure 6 is a section of Figure 5.

As shown in the drawing:

The reference numeral 10 indicates generally a cylinder head gasket which preferably is die-cut or stamped from an integral sheet of material which has been preliminarily prepared and produced in accordance with the improved process of this invention. Obviously, cylinder head gaskets of any type may be so die-cut or otherwise formed from this material which is especially adaptable to this use on account of its non-sticking features, and its resilient or springy qualities which are brought out to the fullest extent by the improved treatment of this invention.

The reference numeral 12 indicates a typical manifold gasket used in exhaust manifolds of automobiles or the like and which also can be very easily shaped or formed from the improved product hereinafter described.

The reference numeral 14 illustrates a gasket commonly used in carbureter connections, and here again the improved product of this invention being impervious to the penetrating and saturating action of gasoline and gasoline vapor will be found particularly efficaceous.

The reference numeral 16 illustrates a type of gasket used in steam and air-line connections and other work, and on account of the non-wicking, non-adhesive, and other useful qualities of this gasket, the same will be found particularly applicable in this type of work and installations of gaskets of this type will be rendered much more easy and simple than has heretofore been considered possible especially on replacement jobs.

The reference numeral 18 shows a sheet from which the gasket of this invention is formed, the

Published by AsbestosClaims.Law
asbestosclaims.law/library/23605/2

117. COATING; PROCESSES AND MISCELLANEOUS PRODUCTS.
Cross Reference
Examiner
167

surface of the same being preferably preliminarily scored in two or more directions as shown by the lines 20 and 22 so as to produce a multiplicity of small cushion-like protuberances which act to provide a better fit and contact between the surfaces of the gasket and adjacent parts when the same is in position. This scoring may also take place after treatment if considered necessary or desirable.

It will be obvious that the above show only a few representative types of gaskets and that the improved sheet of this invention is not by any means limited to the embodiments illustrated, but can be used over a very wide range of applications and embodied in many different types.

In practicing the improved process of this invention, a sheet of asbestos millboard of any suitable dimensions and thickness is preliminarily saturated with a solution of certain vegetable oils, the preferred composition of the saturating solution being one containing China wood and linseed oils together with turpentine and certain driers such as metallic resinates.

A suitable composition of the above ingredients is as follows: China wood oil 50 to 90%; linseed oil 5 to 25%; turpentine 5 to 30%; manganese resinate ¼ to 2%; lead resinate ¼ to 2%.

Other oils such as tung oil and the like may be substituted in whole or in part, and other driers may be used, and one of the driers may be used to replace the other in whole or in part.

A preferred composition of the saturating solution and one which has been found to be especially desirable is as follows: China wood oil, 70.5%; linseed oil 12.5%; turpentine 15%; manganese resinate 1%; lead resinate 1%.

A preferred method of preparation of the saturating solution consists of dissolving the manganese and lead resinate driers in the turpentine by heating and stirring for approximately two hours at a temperature of approximately 220° F. When the driers are completely dissolved, the linseed and China wood oils are added, the same being either hot or cold and preferably preliminarily mixed with each other and the whole is then stirred until a homogeneous solution results. The drying agents may be dissolved in the oils instead of in the turpentine, if desired.

The above prepared solution is then placed in a saturating tank or vessel and kept at a temperature of 130 to 135° F. while the asbestos is being saturated.

The asbestos sheets are usually the common asbestos millboard of approximately one-sixteenth inch thickness such as are generally employed in gasket construction, and can be of any suitable linear dimensions. The saturation operation is preferably mechanical, and is so timed as to require approximately one to two minutes depending upon the original quality of the millboard, the thickness and also to some extent upon the use to which the final product is to be put.

After saturation, the sheets are run through rubber rollers or wringers to remove excess oil and dried, and if desired, may be air-cooled either before or after the wringing operation.

The saturated sheets are then transferred to an oven and baked for approximately forty to sixty minutes depending upon requirements. The heat in the oven is automatically controlled, the sheets entering at a temperature of approximately 225° F. which is gradually raised to about 350° F. or even as high as 380° F. and are then slightly preliminarily cooled before removal from the oven. The sheets are then given a coating of a graphite mixture and again baked for approximately fifteen to twenty minutes at temperatures of 340 to 350° F.

The graphite mixture is preferably as follows: graphite 40 to 70%; linseed oil 25 to 55%; turpentine 2 to 10%; and a small amount of a suitable drier. A preferred graphite mixture is graphite 55%; linseed oil 38%; turpentine 8.1%; drier such as manganese and lead resinates .9%.

After the sheets have been air-cooled and dried, they may be die-cut, stamped or otherwise shaped into gaskets and the exposed edges can then be protected by a subsequent dipping in a casein or similar glue to prevent water saturation or what is technically known as "wicking".

The time of baking and the amount of saturant which latter is controlled by the time in the saturating tank and also the ingredients of the saturant themselves can be varied so as to produce a softer or harder gasket as desired and also so as to change the toughness, resiliency, permeability and other qualities throughout quite a considerable range depending upon the use to which the final gasket is to be put.

The final gasket may also be coated with a metallic powder by spraying or dipping, and the surface may be softened by some suitable treatment as, for example, the formation of a plurality of protuberances thereon by running the sheet either before or after treatment through forming rollers or simply by scoring the same in two or more directions as illustrated in Figure 5.

The surface may also be softened by cording, indenting, knurling or in any other suitable manner.

If desired, certain portions of the gasket may be reinforced by metal flanges, such as shown in the co-pending application of John H. Victor for patent on "Skeleton metal-backed gasket", Serial No. 706,932, filed January 17, 1934.

Various tests have demonstrated the highly desirable qualities of this material as compared with the original raw asbestos or millboard. For example, the tensile strength of a sheet of raw asbestos or millboard is usually a maximum of about forty-five pounds per inch of a sheet one-sixteenth of an inch thick. The tensile strength of the improved sheet of this invention after treatment is over two hundred pounds per square inch.

On a breaking or bursting test known as the Mullen test, the raw asbestos broke at a sixty pound pressure per square inch of a sheet one-sixteenth of an inch thick, while the improved sheet of this invention resists pressures of one hundred and fifty pounds and more.

A resiliency and compression test known as the Monotron test demonstrated that a sheet of raw asbestos one-sixteenth of an inch thick would compress .0162 inches under a pressure of 360 pounds applied on a disc ⅜ inches in diameter, while the improved sheet of this invention compresses only .007 inches under the same conditions. Upon releasing the pressure, the raw asbestos returned or sprung back .0047 inches, while the improved asbestos returned .0036 inches.

A tear test showed that the original asbestos millboard tore under a weight of three hundred grams while the treated sheet did not tear under a weight of five or six thousand grams.

Other tests such as water absorption and fire tests demonstrated conclusively the superiority of the prepared material over the original raw asbestos.

An analysis of the resiliency and compression tests shows that the sheet of raw asbestos or millboard usually used for gaskets will compress about one-fourth of its original thickness under a 360 pound pressure, but will only return to about 25% of this distance when the pressure is released. The same sheet treated in accordance with this invention compresses only about one-tenth of its original thickness under the same conditions and returns over one-half of this distance when the pressure is released, thereby demonstrating that the resiliency is increased over one hundred per cent.

The cushion-like protuberances shown in Figures 5 and 6 are preferably alternately staggered on opposite sides of the sheet, and the depressions between these protuberances can be filled with a graphite coating, such as described, to produce a smoother surface and one which will slide or move relatively to the faces of the metal against which the gasket is applied. This will eliminate undesirable buckling of the gasket under temperature changes of the various parts of automobile motors or the like, and which has in the past constituted a very serious problem. The graphite coating also increases heat resistance.

Instead of asbestos millboard, asbestos paper may be used or any other packing material such as paper itself.

Sheets of this material can be built up into a laminated structure for various types of gaskets wherein heat insulation is particularly desired, and gaskets may also be molded from asbestos pulp or the like with the ingredients of this invention added.

Aluminum stearate may be used with the oils to a proportion up to about fifty per cent, and the use of this material, in many instances, tends to increase the water and other liquid resisting qualities.

It is believed that the oxidation of the various oils in the fibers and interstices of the original asbestos sheet produce these exceptional qualities wherein the resultant material is particularly well adapted for use as a gasket without the use of any accessory material such as metal flanges or other protection either inside or outside the same. Sticking and consequent tearing under removal is definitely eliminated, and the sheet, after cutting, forming and shaping, can be handled as an ordinary gasket without fear of tearing or breaking, even though all metal reinforcements, covers, flanges and the like heretofore considered necessary are absent.

We are aware that herein is provided a sheet of material from which gaskets and other packing elements may be formed at considerably less expense than has heretofore been necessary while, at the same time, a gasket is produced which is at least as efficient and in many instances even better than the combination metal and asbestos gaskets heretofore almost universally used.

We are aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and we, therefore, do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

We claim as our invention:

1. An improved saturated sheet for gaskets and packing, comprising asbestos millboard impregnated with a composition resulting from a mixture of drying vegetable oils, namely, China wood oil approximately 50 to 90% and linseed oil approximately 5 to 25% together with turpentine 5 to 30% and metallic resinates 1 to 2%.

2. The process of preparing gasket material comprising saturating asbestos sheets with a mixture of vegetable oils of the drying and semi-drying type including China wood oil 70%, linseed oil 12% with the addition of turpentine around 15% and metallic resinates about 2%, the saturating temperature being about 130° F. and subsequently baking at approximately 360° F.

BENJAMIN J. VICTOR.
WILLIAM A. HEINZE.
JOHN H. VICTOR.

Published by AsbestosClaims.Law
asbestosclaims.law/library/23605/4