UNITED STATES PATENT OFFICE.

JOHN JOHNSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND JAMES H. GILBERT, OF SAME PLACE.

IMPROVEMENT IN COMPOSITIONS FOR JOURNAL-BEARINGS.

Specification forming part of Letters Patent No. **209,170**, dated October 22, 1878; application filed April 16, 1878.

To all whom it may concern:

Be it known that I, JOHN JOHNSON, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Lubricating Compounds, which improvement is fully set forth in the following specification.

Hard self-lubricating compounds for journal-bearings consisting, in the main, of plumbago as the lubricant and of asbestus as the necessary ingredient to prevent the development of heat, the latter (asbestus) being a non-conductor of heat and the whole forming a suitable indurating binding medium, have already been the subject of Letters Patent issued to me.

The compounds described in said Letters Patent possess valuable properties, each when properly used in connection with machinery for which it is best adapted. For spindle-bearings and some other uses, however, it has been found that, owing to the rough usage they are often subjected to by operators, and particularly when the spindles are lifted out of their bearings and violently replaced, it often happens that the sharp pivots on striking the compound chip the same off or break them. It therefore became necessary to produce a compound possessing the same lubricating and heat-resisting properties, but which also shall resist percussive action to which it may be exposed and subjected.

The object of this invention, therefore, is to make a plumbago-asbestus compound which shall be hard, lubrifiant, tough, yet capable of being molded to receive the finest and most delicate impression, and so that bearings for spindles of the most delicate structure may be provided.

Another object of my invention is to make the journal-bearings in molds from which the compounds may be removed and placed in special metallic or wooden cases, or in frames of any material adapted to receive them.

To this end my invention consists, first, in a new composition of matter, being a plumbago-vulcanite, one of the ingredients of which is asbestus; second, in the method of compounding, molding, and shaping asbestus-plumbago-vulcanite compounds, as hereinafter described; third, in making the same in molds or cases with which they are permanently or temporarily united; fourth, in making the plumbago compounds with external polygonal configuration, or by otherwise equivalently forming the same so as to prevent them from rotating within the cases or to fit the same directly into similar polygonally-formed or otherwise equivalently-shaped receptacles in a frame or other structure.

To enable others to make and use my said invention, I shall now proceed to describe the manner in which the same is or may be carried into effect.

I take fourteen pounds of plumbago, eight ounces of asbestus, four pounds of rubber, and one pound of sulphur. I first have the plumbago and asbestus finely pulverized and mixed together with the sulphur; then it is ground in with the rubber between the rollers in the manner well known to rubber manufacturers until all the different ingredients are thoroughly incorporated in and taken up by the rubber, formed with it a homogeneous mass. It is then rolled out into sheets and cut into strips of the required length, according to the case or article that is to be made from it. I then roll up the strip very close into a stick or cylinder, and with light pressure force it into a metal case made for its reception. The compound in its case is then vulcanized in the usual way. The hole or bearing surfaces may then be drilled out according to sizes and forms of the spindles or pivots or journals.

Another and perhaps more economical plan of making the journal-bearings of the compound described consists in molding the bearings or holes before and during vulcanization by means of a plate having a central pin, which is a counterpart of the bearing. The case or mold being packed with the compound, it is then closed by means of the plate, the pin of which impresses the form of the bearing-surface. The case is then vulcanized, cooled, and the top plate is removed from it.

Another method consists in cutting the compound into strips of the required width, to roll it on and over a pin, which is like the journal, and until the space between the pin and case is filled.

After vulcanization the pin is removed, per-

manently leaving the hole or journal-bearing in the compound in a perfect condition as to shape and size.

The cases or molds may be made to separate in two or more longitudinal parts, so as to allow of the delivery of the vulcanized compound and of its use in separate cases.

To prevent such vulcanized bearings from rotating in their cases, I prefer to make the outer surface of the molded compound polygonal or prismatic, to be used in cases the interiors of which are similarly or correspondingly shaped.

Instead of the polygonal shape any other form or device may be adopted—for instance, a groove in the one and a lug, spline, or stud on the other. Again, the cases may be entirely dispensed with, except as molds for the shaping and vulcanization of the compound, and the frame may have receptacles or holes suitably shaped for the reception of the compound bearings, which, if made as described, will be found strong enough to resist pressure, blows, &c., without the aid of the metal cases, more or less necessary with other compounds.

I have described my compound as applied to spindle or pivotal bearings. It is obvious, however, that the compound may be used in connection with other bearings, for such as journals of axles, collars, &c.

Different uses and applications of my compound will require corresponding differences in cases, molds, &c., which, however, will readily suggest themselves without exercise of invention to any competent mechanic, and need no further description or illustration.

I would remark that I have given the ingredients and proportions of the ingredients making up my improved compound as those which, after numerous experiments, I have found to be best, although good results have been obtained by me by varying the proportions of the ingredients within certain limits, and by adding also other foreign matter; but I prefer, as before stated, the compound, as described, without admixture or adulteration, and in the proportions named.

Having thus described my said invention, what I claim, and desire to secure by Letters Patent, is—

1. As a new composition of matter, a plumbago-vulcanite, one of the ingredients of which is asbestus.

2. The method herein described of compounding plumbago, asbestus, sulphur, and rubber, for the purpose of making a self-lubricating journal-bearing compound by intimately mixing the same and rolling the same into sheets previous to being vulcanized.

3. The method of molding and vulcanizing the journal-bearing compound herein described, consisting of rubber, sulphur, plumbago, and asbestus, by forming the same into a sheet, rolling the sheet into a cylinder, (whether with or without a temporary pin,) packing the mold therewith, and subjecting the same to vulcanizing-heat, substantially as and for the purposes set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN JOHNSON.

Witnesses:
JAMES H. GILBERT,
EDWARD M. JOHNSON.