(No Model.)

H. HOWSON.

PROCESS OF MAKING COMPOSITION BEARINGS.

No. 476,145. Patented May 31, 1892.

FIG. 1.

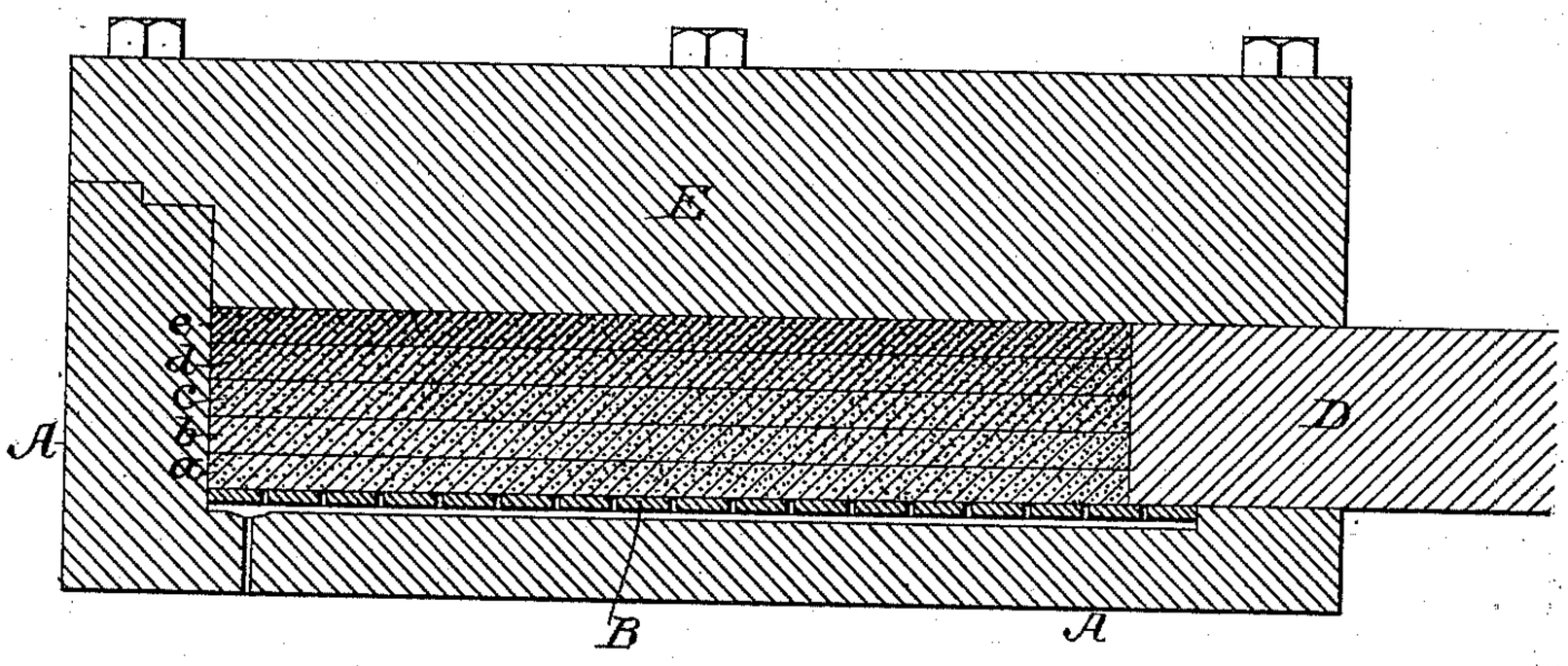


FIG. 2.

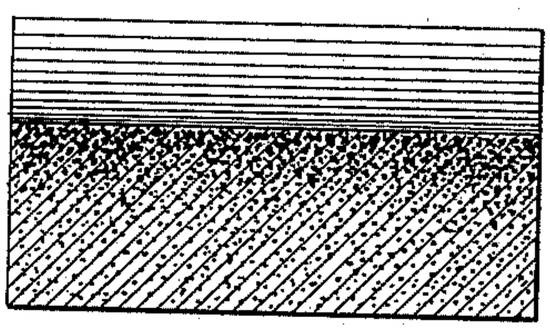
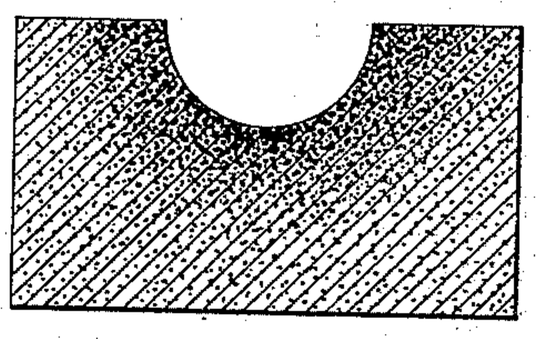


FIG. 3.



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UNITED STATES PATENT OFFICE.

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PROCESS OF MAKING COMPOSITION BEARINGS.

SPECIFICATION forming part of Letters Patent No. 476,145, dated May 31, 1892.

Application filed March 9, 1892. Serial No. 424,291. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY HOWSON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in the Process of Making Composition Bearings, of which the following is a specification.

The object of my invention is to form a bearing of lubricating material and binding material compressed into form that will effectually withstand severe strains and shocks, the bearing being especially adapted for car-axle journals, stamping-machine journals, and to bearings generally which are subjected to pressure and also subjected to severe shocks and strains.

The compound I prefer to use in carrying out my invention is a mixture of fiber and plumbago, combined with a suitable binder, preferably a drying-oil or semi-drying-oil, which will be resinified by the action of heat, to which the bearing is subjected during its manufacture; but it will be understood that different materials may be used than those mentioned—for instance, soapstone can be substituted for plumbago and other fibers may be substituted for divided wood fiber—and that any of the well-known fluid-binders may be used in place of the resinified-oil binder.

In the accompanying drawings, Figure 1 is a sectional view of the mold, showing in diagram my improved process of manufacturing composition bearings. Fig. 2 is a longitudinal sectional view of the mold and bearings. Fig. 3 is a transverse sectional view.

In the specification I will use the term "lubricating material" to mean plumbago, soapstone, or equivalent material, and "supporting material" to mean fiber or other material which will act as a support for the lubricating material.

I will now describe my process in connection with fiber and plumbago and an oil-binder, as the best possible results are obtained by using this composition.

The plumbago is mixed with finely-divided fiber by stirring it with the fiber in a liquid solution, simply using water. I preferably make several batches of this material, one batch in which the proportion of plumbago to fiber is very great. In fact, in some instances the plumbago may be in a pure state. The next batch may have a greater proportion of plumbago to fiber. The next batch may have the plumbago and fiber in the same proportion, and the fourth batch may have the fiber in excess of plumbago, and the fifth or last batch may be all fiber.

I first place in the mold a layer *a* of fiber. Then I place upon this a layer *b* of a compound consisting of fiber and plumbago in which the fiber is in excess. Then next to this I place a layer *c* of material in which the plumbago and fiber are of equal parts, and upon this I place a layer *d* in which the portion of plumbago is in excess of the fiber, and upon the latter I place a final layer of either pure plumbago or plumbago with a small quantity of fiber.

In the bottom of the mold A is the drainage-plate B, and in one end of the mold is a plunger D, and closing the mold is a cap E, secured to the body A in any suitable manner.

When the body of the mold is filled, as described above, the cap E is placed in position and the plunger forced into the mold, compressing the material therein to the density required, the liquid escaping from the material through the perforated plate, the supporting material acting as a filter, preventing the escape of the lubricating material from the mold. When fiber is used, which is the preferred material for use as a supporting medium, the fiber of one layer will become entangled with the fiber of another layer, as the liquid has a tendency to carry the fiber with it. Consequently the several sections become interlocked under the heavy pressure and a bearing is made from a homogeneous mass having a greater proportion of lubricating material at the face than at the back and at the same time having a greater proportion, by preference, of supporting material at the back than lubricating material.

While I have described a bearing made from five layers of material, it will be understood that it can be made from two or more

layers, depending upon the work for which the bearing is intended and the thickness of the bearing. I am thus enabled to produce a bearing having a good lubricating-surface supported and strengthened by the backing formed of fiber, which is, however, a part of the bearing and is so intimately mixed with the plumbago and fiber at the bearing-surface that any severe strains or shocks which would under ordinary circumstances crack and destroy the bearing-surface will be taken up and sustained by the backing of fiber, the latter being tough and strong and possessing a certain amount of elasticity.

In some instances the order in which the layers may be placed in the mold may be reversed, the plumbago being placed in the mold first and the backing-fiber last.

By the term "bearing" as I use it is meant any machine, element, or structure which is subjected to friction, and it will be understood, while I have shown simply one form of mold for carrying my invention into effect, other molds may be used and the bearing may be shaped differently from the bearings shown in Figs. 2 and 3, these views being simply shown to illustrate one form of bearing.

I claim as my invention—

1. The process herein described of manufacturing bearings, said process consisting in placing in a mold two or more layers of material, one of said layers having a greater proportion of lubricating material than the other, and compressing the material in a mold to form a solid homogeneous mass, in which the proportion of lubricating material to sustaining material is greater at the face than at the back, substantially as described.

2. The process herein described of manufacturing bearings, &c., said process consisting in placing in a mold two or more layers of material, one of said layers having a greater proportion of supporting material than the other, and compressing the material in the mold, so that the supporting material at the back of the bearing will act as a filter and prevent the escape of the lubricating material during the compression of the mass, substantially as specified.

3. The process herein described of manufacturing composition bearings, the process consisting in first placing a series of layers of lubricating and supporting material in the mold in a semi-fluid state, compressing the material in the mold, so as to unite the layers and to remove the liquid, drying the composition thus formed, impregnating the mass with a fluid binder, and drying the composition, so as to set, solidify, and harden the mass, substantially as described.

4. The process herein described of manufacturing composition bearings, said process consisting in first placing a series of layers of fiber and a lubricating material, such as plumbago, in a suitable mold, securing the composition in the mold, and subjecting the composition to an end pressure, so as to make the fibers in one section entangle with the fibers of the adjoining section to form a solid homogeneous mass, substantially as described.

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

HENRY HOWSON.

Witnesses:
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