June 5, 1934. A. E. RICARD 1,961,304

METHOD OF TREATMENT OF FRICTION PIECES COMPRISING AN EXUDING SUBSTANCE

Filed Oct. 29, 1930

Fig. 1

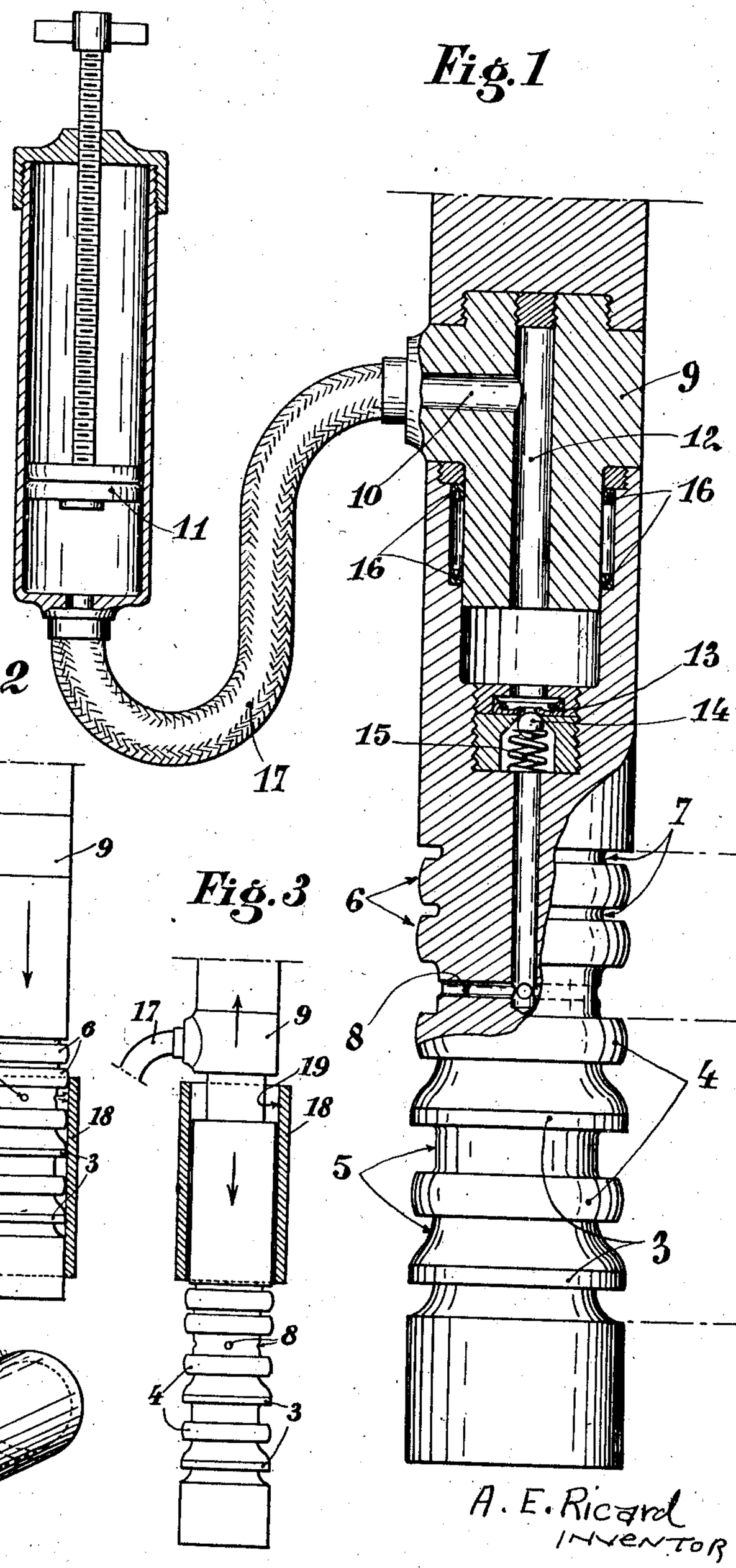


Fig. 2

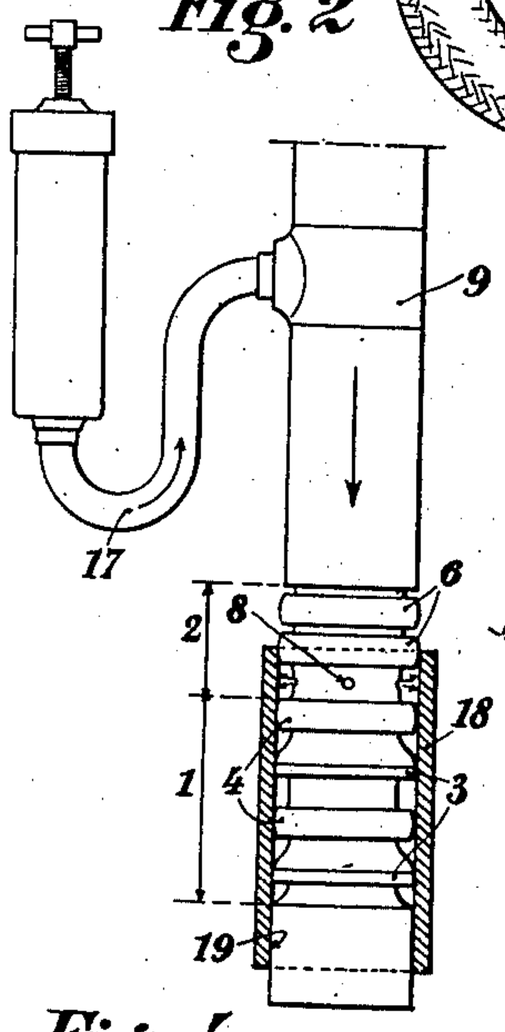
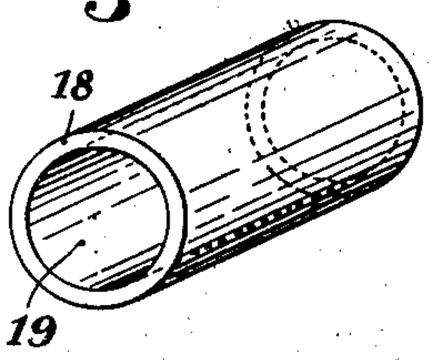


Fig. 3

Fig. 4



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1,961,304

METHOD OF TREATMENT OF FRICTION PIECES COMPRISING AN EXUDING SUBSTANCE

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10 Claims. (Cl. 29—149.5)

Methods are known whereby the coefficient of friction of certain antifriction alloys and in particular of white alloys is reduced, through mixing a certain proportion of graphite with the latter.

All these methods are very much complicated and comprise the mixing of the graphite with the alloy in a preliminary treatment before the alloy is put in its place for use. It has been suggested with a view of obtaining intimate mixture of the graphite with the alloy, either to effect said mixture in vacuum at high temperature or to resort to the high pressures procured from hydraulic presses at the softening temperature of the metal. It will be understood that with such methods, the laboratory or smelting furnace will be made to withstand the effects of vacuum or of extremely high pressures, while the mixture has to be stirred constantly by mechanical agitator.

Further, it is necessary, after this elaboration, to subject such graphite including mixture to another melting, in order to cast said mixture into the bearing bushing. The liquation has for its effect to separate the graphite from the metal and to thus destroy the homogeneity of the alloy.

The present invention relates to an improvement to the process for treating blocks integrally made of an antifriction alloy having initially a hard surface and containing a soft substance such as lead adapted to exude under the effect of pressure, that process consisting in exerting a high pressure throughout the surface of the block to cause an exudation of the soft substance.

According to the invention, graphite is applied on the surface of the block in such a way that said graphite will be embodied in the film of exudation.

The graphite is preferably colloidal graphite, which is used agglomerated or not. The agglomerated graphite is obtained by mixing the graphite with melted tallow, whereby the graphite can be given a suitable consistency.

Owing to colloidal graphite being present in the filmy blade of soft-metal, lead for instance, the latter requires greater uniformity and homogeneity, the intimate mixture of lead with graphite being very easily effected owing to both the unctuousness of colloidal graphite and the minute thickness of the filmy exudation involved.

According to another feature of the invention, graphite is brought by any suitable means into contact with the film of exuded substance during the operation of producing exudation, this being done either by coating the tool which cause the pressure effect or by supplying graphite through any suitable means during the exudation operation.

In the appended drawing;

Fig. 1 shows only by way of example in elevation and partial section a tool adapted to be forced through the bore of a bearing bushing or the like, in order to cause exudation and to simultaneously incorporate graphite to the film of exudation.

Fig. 2 shows the tool at the beginning of the operation.

Fig. 3 shows the end of this operation.

Fig. 4 illustrates a bearing member according to the invention.

The tool comprises two principal parts: a part 1 comprising a number of reamers 3 and of knobs or collars 4 separated by grooves 5, this part serves to destroy the rugosities of the metal, due to the machining, and a second part 2 comprising a number of knobs or collars 6 separated by grooves 7, this second part serving to produce the exudation in a known manner and to incorporate the graphite into the film formed. The graphite is introduced in the groove between both parts 1 and 2 through channels 8. The graphite is brought under pressure to an opening 10 of part 9 of the press through a flexible tube 7, the pressure being effected from a piston acting screw 11, for instance. The graphite is brought in a central channel 12 and enters the tool by passing through an obturator comprising an apertured leather 13, a ball 14 and a coiled spring 15. The graphite is then brought between the knobs through the channel 8. The tightness between the press and the tool is obtained through leather 16.

It will be well understood that the bringing down of the press causes the forcing of the tool through the bearing bore. When the tool occupies the position shown in Fig. 2, graphite enters through orifices 8 and is applied against the inner walls 19 of the bearing member 18. At the end of the operation when the tool has traversed the bearing the bringing out of the press will cause the rising of the part 9 alone (Fig. 3), the tightness of the tool being ensured through the ball obturator. The finished bearing member is shown in Fig. 3.

This method shows a peculiar advantage in preventing lead from sticking to the spindle, and in thus avoiding any chance of lead being driven by the spindle as well as any metal being torn off which might occur on account of the comparatively high pressure initiated at the surface

of the piece from the successive passages of progressively diametered knobs.

It stands to reason that the various instances of introduction of colloidal graphite into the filmy exudation of the exuding substance as selected here are given purely for the sake of example and that the method, time, importance as well as other factors featuring the introduction of graphite may be modified in any suitable manner without departing from the scope of the invention.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. A process for treating bearings of antifriction alloy having initially a hard bearing surface and containing an exudable soft substance, consisting in causing said soft substance to exude, preferably by forcing a mandrel of a somewhat larger diameter through the bore and to form a film on said bearing surface and in incorporating graphite into said exuded film.

2. Method as claimed in claim 1, in which exudation is effected by mandrelling.

3. Method as claimed in claim 1, in which exudation is effected by mandrelling for obtaining the truing of the piece.

4. Method of treatment of friction pieces, at least one of which comprises an exuding substance comprising mandrelling of a piece by means of a mandrel provided with several knobs and introducing graphite in said knobs.

5. An improved process for treating bearings of anti-friction alloy having initially a hard bearing surface and containing a soft substance, adapted to exude on the surface under the effect of pressure, consisting in applying pressure over said bearing surface and causing said soft substance to exude preferably by forcing a mandrel of a somewhat larger diameter through the bore and to form a coating film on the bearing surface of the bearing and incorporating graphite into said exuded film.

6. An improved process as claimed in claim 5, in which the graphite used is in a colloidal state.

7. An improved process as claimed in claim 5, in which the graphite is agglomerated colloidal graphite.

8. A process for treating bearings of antifriction alloy having initially a hard surface and containing an exudable soft substance, adapted to exude under the effect of pressure which consists in reaming the bearing bore to substantially its final diameter and thereafter forcing a mandrel of somewhat larger diameter through said bore, the exterior and operative surface of said mandrel being coated with colloidal graphite.

9. An antifriction bearing bushing of an alloy having initially a hard bearing surface and containing an exudable soft substance adapted to exude under the effect of pressure, wherein the inner surface of the bore is covered with a thin exuded film of said soft substance, graphite being incorporated into said film.

10. An improved process for treating bored bearings of anti-friction alloy having an initially hard bearing surface and containing a soft exudable substance, consisting in causing said soft substance to exude, preferably by forcing a mandrel of somewhat larger diameter through the bore and to form a coating film on the bearing surface and simultaneously pressing graphite onto said bearing surface, said graphite being adapted to be incorporated into said exuded film.

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