受験番号：18IPM020

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問1

[0002] Fig. 1 is a view illustrating one example of a conventional organic-material ejection nozzle. The ejection nozzle 10 is coupled to an outer wall 21 by, e.g., a threaded coupler 12, and the outer wall 21 defines a chamber 20.
[0003] In vapor deposition, the chamber 20 and the ejection nozzle 10 contact a vaporized source material passing through an ejection hole 11, so that high-temperature states of the chamber 20 and the ejection nozzle 10 are established by heat transferred from the vaporized source material. After completion of the vapor deposition, low-temperature states of the chamber 20 and the ejection nozzle 10 are established again. In course of repetition of the vapor deposition, the chamber 20 and the ejection nozzle 10 are subjected to a cyclic load which is caused by repeated expansion and contraction of the chamber 20 and the ejection nozzle 10 due to the heat. Such a cyclic load due to heat may unfortunately cause slack and/or crack in a portion of the threaded coupler 12 for coupling the ejection nozzle 10 to the outer wall 21 defining the chamber 20, leading to a fine clearance formed between the ejection nozzle 10 and the outer wall 21 defining the chamber 20.
[0004] In the event of such damage to the coupler for coupling the ejection nozzle and the chamber, the vaporized source material in the chamber may leak out to the outside from the damaged portion of the coupler, which may result in not only the expensive source material being lost but also an area different from a substrate being soiled with the source material having leaked.

問2

[0010] Fig. 1 is a cross-sectional view illustrating a porous plastic bearing according to Embodiment 1, and Fig. 2 is a cross-sectional view taken along line II-II in Fig. 1. In Figs. 1 and 2, reference numeral 1 denotes a shaft (a rotation shaft), and reference numeral 2 denotes a plain bearing formed of porous plastic. The shaft 1 is rotatably borne by the plain bearing 2. The plain bearing 2 is constituted by a collective sintered body of plastic particles 3 formed of ABS resin, and lubricating oil 4 with which the collective sintered body is impregnated. Reference numeral 3a denotes pores formed between the plastic particles 3. The lubricating oil 4 flows through these pores 3a and exudes from the pores 3a to an inner circumferential surface of the plain bearing 2.
[0011] More specifically, the plain bearing 2 is formed by sintering of a collection of a multiplicity of the plastic particles 3 (more than one plastic particle 3) each having a deposition of 0.004-4 cube mm, which collection has a porosity of 10-30 %.
[0012] Rotation of the shaft 1 generates a negative pressure on an opposite side from a loaded side between the shaft 1 and the inner circumferential surface of the plain bearing 2. Thus, the lubricating oil 4 spreading between the plastic particles 3 of the plain bearing 2 exudes to the inner circumferential surface of the plain bearing 2 and flows to a loaded portion of the inner circumferential surface of the plain bearing 2 which is nearest to the

shaft 1 among the inner circumferential surface. A positive pressure is generated at this loaded portion, which avoids a contact between the shaft 1 and the plain bearing 2, resulting in a reduced frictional resistance between the shaft 1 and the plain bearing 2.

コメント：[0010]のII-II線は、図１を見るとI-I線となっておりますが、II-II線が正しいと考えそのまま訳しました。図面を修正するべきと考えます。

問3
(1) stepの語を使用するクレーム

1. A method for manufacturing a gear, comprising:
a gear processing step of machining steel to obtain a gear having a predetermined shape; and
a quenching step of quenching the gear by heating the obtained gear to cause a change thereof to an Austenite phase and thereafter rapidly cooling the gear to cause a change thereof to a Martensite phase under an atmosphere containing carbonization gas and ammonia gas,
wherein the quenching step comprises a step of adjusting an amount of retained austenite on an uppermost surface including a tooth surface of the gear, to 40-80 % of a volume of the steel.

(2) stepの語を使用しないクレーム

1. A method for manufacturing a gear, comprising:
machining steel to obtain a gear having a predetermined shape; and
quenching the gear by heating the obtained gear to cause a change thereof to an Austenite phase and thereafter rapidly cooling the gear to cause a change thereof to a Martensite phase under an atmosphere containing carbonization gas and ammonia gas,
wherein in the quenching, an amount of retained austenite on an uppermost surface including a tooth surface of the gear is adjusted to 40-80 % of a volume of the steel.