

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOSHIHIRO ENDO,
YASUO YAMAMOTO and
TADAYUKI WAKATABI

Appeal No. 2006-0145
Application 09/639,850

ON BRIEF

Before THOMAS, KRASS, and GROSS, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from twice-rejected claims 2-8.

The invention is directed to a pump for supplying ink to an ink supply roll of a stencil printer. Conventionally, a piston pump or a plunger pump was used. When ultraviolet ray curing ink is used in such a stencil printer, curing of the ink at a part where friction by sliding is applied to the ink can

causes trouble. When the ink cures, excessive load is applied to the pump and the pump can become damaged. As an improvement thereover, the instant invention employs a diaphragm pump to avoid this friction, so that curing of the ink can be suppressed. Moreover, it is alleged that by arranging the diaphragm pump to be stopped in a position where the stress applied to the diaphragm is not larger than 75% of the elastic limit of the diaphragm, deterioration-deformation of the diaphragm can be suppressed and the initial performance of the pump can be lengthened.

Representative independent claim 8 is reproduced as follows:

8. A stencil printer comprising:

an ink supply pump comprising a diaphragm pump having a diaphragm operable between a first position preventing fluid flow of an ink and a second position permitting fluid flow of the ink therethrough; and

a drive assembly for driving said diaphragm between said first and second positions,

wherein said diaphragm is driven by said drive assembly such that a stress applied to the diaphragm is limited to less than 75% of the elastic limit of the diaphragm.

The examiner relies on the following references:

Miller et al. (Miller)	3,843,974	Oct. 29, 1974
Black et al. (Black)	4,051,777	Oct. 04, 1977
Mastromatteo	4,111,056	Sep. 05, 1978
Kawahata et al. (Kawahata)	5,019,202	May 28, 1991
Klein	5,263,693	Nov. 23, 1993

Additionally, the examiner relies on appellants' admitted prior art (APA) regarding the swelling ratio of silicone rubber, at page 8, lines 4-10, and Table 3 of the instant application.

Claims 2-8 stand rejected under 35 U.S.C. §103. As evidence of obviousness, the examiner offers Black and Mastromatteo with regard to claims 2, 3, and 8, alternatively adding to this combination, Klein with regard to claim 4, Kawahata with regard to claims 5 and 7, and Miller and APA with regard to claim 6.

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

In rejecting claims under 35 U.S.C. §103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). To reach a conclusion of obviousness under §103, the examiner must produce a factual basis supported by a teaching in a prior art reference or shown to be common knowledge of unquestionable demonstration. Our reviewing court requires this evidence in order to establish a prima facie case. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). The examiner may satisfy his/her burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead the individual to combine the relevant teachings of the references. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

With regard to claims 2, 3, and 8, the examiner contends that Black teaches the claimed invention (ink supply pump in Figure 4, a diaphragm pump at 146, column 5, lines 5-20, disclosing the diaphragm being operable between first and second positions for preventing and permitting flow of ink, and a drive assembly (at 142, 144) for driving the diaphragm between the two positions) except for the stress applied to the diaphragm being less than 75% of the elastic limit of the diaphragm.

The examiner turns to Mastromatteo for a teaching of limiting deformation of a diaphragm to a stress below the elastic limit in order for the diaphragm to return from a pressure loaded position to a preloaded position. The examiner refers to column 6, lines 9-20, of Mastromatteo.

The examiner then concludes that it would have been obvious to apply the stress to the diaphragm pump in Black at a level below the elastic limit of the diaphragm, as taught by Mastromatteo,

so that the diaphragm would maintain its desired positions during use. With respect to the recitation of stress applied to the diaphragm being limited to less than 75% of the elastic limit, since Mastromatteo...teaches to apply stress below the elastic limit, the optimum stress required in order to maintain the diaphragm in proper form would be determined by those having ordinary skill in the art through routine experimentations (answer-page 4).

Appellants argue that there is insufficient motivation to make the proposed combination because Mastromatteo discloses a diaphragm used in a hydraulic device, wherein the diaphragm is used in conjunction with a liquid which acts as a cushion, conforming to the shape of the diaphragm,

thereby preventing damage to the diaphragm. Also, since Mastromatteo's diaphragm is used in "a completely different manner" (principal brief-page 8), and not driven by a drive assembly between a first and second position, as in the instant invention, appellants submit that the skilled artisan in the art of stencil printers would not turn to the teachings of Mastromatteo.

Moreover, appellants contend that it is not possible to ascertain that the stress of the diaphragm of Mastromatteo is or should be limited to less than 75% of the elastic limit of the diaphragm, as required by the instant claims. Thus, argue appellants, even if Mastromatteo is combined with Black, the combination does not teach, disclose, or suggest that a stress applied is limited to less than 75% of the elastic limit of the diaphragm.

We have reviewed the evidence before us, including the applied references and the arguments of appellants and the examiner, and we conclude therefrom that the examiner has failed to establish a prima facie case of obviousness.

While Mastromatteo appears to suggest (column 6, lines 9-21) that if the stress on a diaphragm is kept within its elastic limit, the diaphragm will remain undistorted and resilient, it is unclear to us why the artisan would have taken this teaching of such a diaphragm in a fluid-pressure operated device, such as the hydraulic system of Mastromatteo, and applied it to the diaphragm pump of Black. There is nothing in Black which would have led the artisan to believe there was a potential problem with the diaphragm of the pump.

Moreover, as appellants correctly argue, in our view, even if the combination is made, we find nothing in either of the applied references suggesting that a stress applied should be limited to less

than 75% of the elastic limit of the diaphragm. While Mastromatteo may suggest that the stress on a diaphragm should stay within the elastic limit of the diaphragm, nothing therein even hints at keeping the stress to less than 75% of the elastic limit of the diaphragm.

The examiner recognized this deficiency but asserted that this “optimum” stress “would be determined by those having ordinary skill in the art through routine experimentation” (answer-page 4). The examiner further asserted that the stress limit on the diaphragm is a “result-effective variable” which can be optimized to “prevent permanent deformation to the diaphragm” (answer-page 8). We disagree.

It is true that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of an artisan. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); Also see In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977), In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955). However, we do not find the maximum stress (claims 6 and 7) or the stress (claim 8) of the instant claimed invention to be a “result effective variable.” What is the result observed as this “variable” is adjusted? If one waits for the diaphragm to break, this breakage point would appear to establish the elastic limit of the diaphragm, and the stress that would cause it. But it is not clear to us why the examiner contends that it would have been obvious to “optimize” the stress at “less than 75% of the elastic limit,” or at a point that “does not exceed 75% of the elastic limit,” as claimed. It is also not clear what type of “routine experimentation” by artisans is envisioned by the examiner.

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We agree with appellants that there is nothing in the applied references that would suggest the necessity or the desirability of using the diaphragm driven by the drive assembly such that a stress is applied to the diaphragm that is limited to less than, or equal to, 75% of the elastic limit of the diaphragm.

Accordingly, we will not sustain the rejections of claims 2-8 under 35 U.S.C. §103 because none of the other applied references (Klein, Kawahata, Miller, APA) provides for the deficiencies of Black and Mastromatteo.

The examiner's decision rejecting claims 2-8 under 35 U.S.C. §103 is reversed.

REVERSED

James D. Thomas)	
Administrative Patent Judge)	
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Errol A. Krass)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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