

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DIRK MEERSSCHAUT and GODFRIED VANNESTE

Appeal No. 1996-3859
Application No. 08/278,910¹

ON BRIEF

Before KIMLIN, OWENS and DELMENDO, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's refusal to allow claims 19-32 and 35-38 as amended after final rejection. These are all of the claims remaining in the application.

THE INVENTION

Appellants' claimed invention is directed toward a process for heat treating and then cooling steel wire such

¹ Application for patent filed July 22, 1994.

that austenite is transformed to pearlite and the formation of martensite and bainite is avoided. Claims 19 and 36 are illustrative and read as follows:

19. A process of manufacturing a pearlitic steel wire and avoiding formation of martensite and bainite in steel wire having a diameter which is less than 2.8 mm, comprising the steps of:

(a) heating a steel wire having a diameter which is less than 2.8 mm;

(b) cooling the steel wire from step (a) during a pre-transformation stage, including:

(1) stable film boiling the steel wire by guiding the steel wire into a water bath for a first water cooling period;

(2) cooling the steel wire in air for a first air cooling period;

(c) further cooling the steel wire from step (b) during a transformation stage, including:

(1) stable film boiling the steel wire by guiding the steel wire through a water bath for a second cooling period; and

(2) air cooling the steel wire in air for a second cooling period.

36. A process of manufacturing a pearlitic steel wire and avoiding formation of martensite and bainite in steel wire having a diameter which is less than 1.8 mm, comprising the steps of:

(a) heating a steel wire having a diameter which is less than 1.8 mm;

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(b) cooling the steel wire from step (a) during a pre-transformation stage, including:

- guiding
water
 - air
- (1) stable film boiling the steel wire by the steel wire into a water bath for a cooling period; and
 - (2) air cooling the steel wire in air for an cooling period.

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THE REFERENCES

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|---|-----------|----------|
| Hoffmann 1973 | 3,735,966 | May 29, |
| Bourgois et al. (Bourgois) 1988 | 4,722,210 | Feb. 2, |
| Vanneste (Vanneste '472) 1988 | 4,767,472 | Aug. 30, |
| Vanneste et al. (Vanneste '394) 1988 | 4,788,394 | Nov. 29, |
| Kaneda (JP '592) 1989 | 1-201592 | Aug. 14, |

(Japanese unexamined patent application)

THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 19-26, 32 and 35-38 over Vanneste '472 in view of Hoffmann, and claims 27-31 over Vanneste '472 in view of Hoffmann and JP '592, further in view of either Vanneste '394 or Bourgois.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with the examiner that the invention recited in claims 36 and 37 would have been obvious to one of ordinary skill in the art at the time of appellants' invention over the applied references.

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Accordingly, we affirm the rejection of these claims.

However, we reverse the rejections of the other claims.

Vanneste '472 discloses a process for manufacturing a pearlitic steel wire and avoiding the formation of martensite and bainite in the wire (col. 3, lines 5-9; col. 2, lines 20-25). The wire can have a diameter of about 1.5 to 5 mm (col. 3, lines 53-55). In one embodiment the wire is heated and then cooled by stable film boiling in water and further cooled in air, and transformation to pearlite occurs in the air a few meters after the wire leaves the water bath (col. 6, lines 27-37 and 46-47). Thus, as shown in figure 3 of Vanneste '472, there is a pre-transformation cooling stage in which cooling by stable film boiling and by air cooling take place. The wire used to obtain figure 3 had a diameter of 3.10 mm (col. 6, line 11). However, the teaching that suitable wire diameters include smaller values down to about 1.5 mm (col. 3, lines 53-55) would have fairly suggested, to one of ordinary skill in the art, applying the process of this embodiment to wire diameters as small as about 1.5 mm.

Appellants rely upon an article by Takeo and declarations by Lefever, Meersschaut and Aernoudt for teachings of

difficulty in treating small wire diameters (brief, pages 16-20), but present no argument regarding evidence directed to rebutting the above-discussed *prima facie* case of obviousness of the processes recited in claims 36 and 37.² Consequently, we conclude, based upon the preponderance of the evidence, that the processes recited in these claims would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103.

Claim 38 depends from claim 36 and limits the wire diameter to 1.2 mm or less. The examiner has not provided evidence that one of ordinary skill in the art would have interpreted the Vanneste '472 minimum wire size of about 1.5 mm as including 1.2 mm, or that one of ordinary skill in the art would have had a reasonable expectation that the Vanneste '472 process would be applicable to a wire having a 1.2 mm diameter. See *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). The examiner merely asserts that 1.2 mm is close enough to 1.5 mm that one of ordinary skill in the art would have expected wires having these diameters to have

² Claim 37, which depends from claim 36, limits the wire diameter to 1.5 mm or less.

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the same properties (answer, pages 5 and 13). A diameter of 1.2 mm is 20% lower than a diameter of 1.5 mm, and appellants have challenged the examiner's assertion that wires with both diameters have the same properties (brief, page 16).

Appellants have requested evidence in support of the examiner's assertion. *See id.* The examiner, however, has not provided such evidence, and the examiner's mere speculation is not a sufficient basis for a *prima facie* case of obviousness. *See In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968); *In re Sporck*, 301 F.2d 686, 690, 133 USPQ 360, 364 (CCPA 1962). Accordingly, we reverse the rejection of claim 38.

Claim 19 requires further cooling during a transformation stage by stable film boiling and air cooling. Either all or the major part of the transformation in the Vanneste '472 process takes place during the air cooling step (col. 5, lines 45-51; col. 6, lines 28-36). There is no additional water cooling during a transformation stage.

The examiner argues that merely repeating a known step which produces a final product known to be produced when the

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step is carried out alone does not render a process patentable (answer, page 4). In support of this argument the examiner relies upon *In re Fortress*, 369 F.2d 1009, 152 USPQ 13 (CCPA 1966). In that case the court considered combining two process steps, each lending to the end product the desirable properties each was known to produce when practiced alone, to have been obvious to one of ordinary skill in the art. See 369 F.2d at 1017, 152 USPQ at 19. That is not the fact situation in the present case. Because the examiner has not explained why the teaching of Vanneste '472 would have fairly suggested, to one of ordinary skill in the art, the multiple water cooling and air cooling steps recited in claim 19, we do not find the examiner's argument to be persuasive.

The examiner also relies upon Vanneste '472 in combination with Hoffmann. Hoffmann discloses multiple steps of water cooling and air cooling a hot rolled rod during a pre-transformation stage (col. 3, lines 1-41). Hoffmann teaches that hot rolled rods usually have a diameter of 5 to 12.7 mm (col. 1, lines 34-35) and that during the cooling

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steps, heat from the center of the rod reheats the surface of the rod (col. 1, lines 14-31; figure 1).

The examiner points out that the Vanneste '472 wire and Hoffmann's rod both can have a diameter of 5 mm, and argues that Hoffmann's teaching that "[g]enerally a greater number of successive cooling processes will be possible, more quenching operations being feasible in the case of small diameter rods than in that of large-diameter rods, because of the more rapid equalization of temperature between the core and the periphery" (col. 3, lines 17-22) would have fairly suggested, to one of ordinary skill in the art, use of multiple water cooling and air cooling steps in the Vanneste '472 process (answer, pages 4 and 7-9). Even if the combined teachings of Vanneste '472 and Hoffmann would have fairly suggested, to one of ordinary skill in the art, use of multiple water cooling and air cooling steps when the Vanneste '472 wire is 5 mm, the examiner has not explained why such a person would have been led to use multiple cooling steps when cooling a wire having a diameter below 2.8 mm as recited in appellants' claim 19. Vanneste '472 teaches that when a wire having a 3.10 mm diameter is used (example 1), the desired transformation to

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pearlite is obtained by use of only one water cooling step followed by one air cooling step. Thus, the heating of the surface of the wire by heat from the core of the wire discussed by Hoffmann does not appear to be significant in the Vanneste '472 process. Moreover, in Hoffmann's figure 1 the transformation to pearlite takes place in zone I (col. 3, lines 3-4), which is after the water cooling steps (col. 3, lines 36-50; figure 1). The examiner has not explained why Hoffmann would have fairly suggested, to one of ordinary skill in the art, use of a water cooling step during the transformation stage.

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For the above reasons, we find that the examiner has not set forth a factual basis which is sufficient for supporting a conclusion of obviousness of the invention recited in claim 19.³ We therefore reverse the rejection of this claim and the rejections of claims 20-32 and 35 which depend directly or indirectly therefrom.

DECISION

The rejection under 35 U.S.C. § 103 of claims 36 and 37 over Vanneste '472 in view of Hoffmann is affirmed. The rejections under 35 U.S.C. § 103 of claims 19-26, 32, 35 and 38 over Vanneste '472 in view of Hoffmann, and claims 27-31 over

³ The examiner does not rely upon Vanneste '394 or Bourgois for teachings which would remedy the above-discussed deficiencies in Vanneste '472 and Hoffmann.

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Vanneste '472 in view of Hoffmann and JP '592, further in view
of either Vanneste '394 or Bourgois, are reversed.

AFFIRMED-IN-PART

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| EDWARD C. KIMLIN |) | |
| Administrative Patent Judge |) | |
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| |) | BOARD OF PATENT |
| TERRY J. OWENS |) | APPEALS |
| Administrative Patent Judge |) | AND |
| |) | INTERFERENCES |
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| |) | |
| ROMULO H. DELMENDO |) | |
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