

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte AKIO KOBAYASHI and KATSUYUKI MOROZUMI

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Appeal No. 2000-0008  
Application No. 08/842,990

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ON BRIEF

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Before MCQUADE, CRAWFORD and BAHR, Administrative Patent Judges.  
CRAWFORD, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's rejection of claims 3, 4, 7 and 8, which are all of the claims pending in this application. Claims 1, 2, 5 and 6 have been canceled.

The appellants' invention relates to a method of manufacturing a spline shaft. An understanding of the invention can be derived from a reading of exemplary claim 8, which appears in the appendix to the appellants' brief.

The prior art

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Bononi et al. (Bononi)	4,594,874	June 17, 1986
Hotta et al. (Hotta) (Japanese Patent Application)	62-168627	July 24, 1987 <sup>1</sup>

The Making, Shaping and Treating of Steel, United States Steel Corporation, Seventh Ed., pp. 385-386 & 821-822, (U.S. Steel) (1957)

The rejections

Claims 3, 4, 7 and 8 stand rejected under 35 U.S.C. § 103 as being unpatentable over Bononi in view of U.S. Steel and further in view of Hotta.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejections, we make reference to the final rejection (Paper No. 7) and the answer (Paper No. 13) for the examiner's explanation of the rejection and to the appellants' brief (Paper No. 12) and reply brief (Paper No. 14) for the appellants' arguments thereagainst.

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<sup>1</sup> A translation of this document is attached to this decision.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

In support of the rejection, the examiner states:

In Figure 10 Bononi et al. discloses reducing hollow stock, and in Figure 13 discloses forming splines 162 on the outer surface of one end of the reduced stock. See column 5, lines 44 to 55. Bononi et al. specifies that the shaping is performed by cold extrusion. [final rejection, at page 2].

The examiner relies on U.S. Steel for teaching that strain (work) hardening is an inherent and unavoidable phenomenon resulting from plastic deformation at temperatures below the recrystallization temperature and that as such a "work hardened hollow stock" is formed in the Bononi process.

Appellants argue that none of the prior art references discloses a cold forging method in which the wall thickness of

the hollow stock is reduced but the internal diameter is not substantially changed.

Bononi discloses a cold forging method in which both inside and outside diameters are reduced (Col. 3, lines 46 to 53; Col. 4, lines 25 to 26).

U.S. Steel is silent about the reduction of wall thickness in cold forging of a hollow stock.

Hotta discloses a gear shaft manufacturing method in which a mandrel is inserted into several successive hollow shaft workpieces. In one step of the process a mandrel 3d is inserted into the shaft hole of workpiece M2 and the lower part outer diameter is reduced to a smaller diameter by extrusion and M3 is formed. The inner diameter of M3 appears unchanged. (See Figure 1).

The examiner states:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a mandrel, as shown by Hotta, in Figure 10 extrusion of Bononi et al. in order to obtain controlled wall thickness and inner diameter merely as the utilization of knowledge clearly available in the art for producing desired characteristics in the product, and not a patentable distinction absent a disclosure of criticality in the solution of stated

problems with the production of any specific such dimensions. [final rejection at page 3].

We do not agree with the examiner. We note that appellants' specification discloses that the control of the wall thickness of the hollow stock allows the working degree and shape of the splines to be controlled. In addition, we agree with the appellants that there is no motivation to modify the Bononi method so that the outer diameter is reduced while the inner diameter is not reduced, as taught by Hotta, especially in view of the explicit teachings in Bononi that the hollow stock is worked so that both the inner and outer diameters are both reduced. In our view, such a modification amounts to impermissible hindsight reconstruction of the prior art in order to arrive at the appellants' invention.

In view of the foregoing, we will not sustain the rejection of claim 8 and claims 3, 4 and 7 dependent therefrom. The examiner may want to consider whether the claimed subject matter is patentable over the teachings of Hotta alone or in combination with other prior art references.

The decision is reversed.

REVERSED

JOHN P. McQUADE	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
MURRIEL E. CRAWFORD	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
	)	
JENNIFER D. BAHR	)	
Administrative Patent Judge	)	

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