

COMMISSIONER'S DECISION

Reissue: Explosive Welding

The explosive welding involves a detonated explosive charge to produce a weld and a continuous metallurgical bond. The reissue was filed to claim a specific product (claim 29), but because of the difficulty in expressing precisely what those differences over the prior art may be, it was decided to allow the claim in product by process form. Claim 30 of the parent patent was also allowed in the same form.

Final Action: Affirmed, but claims were allowed if made dependent on the process.

Patent application 284646 (Class 78-44), was filed on August 10, 1977 for an invention entitled "Explosive Welding." The inventors are Vasil Philipchuk et al, assignors to E.F. Industries, Inc. The Examiner in charge of the application took a Final Action on April 18, 1978 refusing to allow it to proceed to patent.

This is a reissue application of Canadian patent 950,242 and is directed to a method of explosive bonding and the products thereof. The reason for the reissue is to add claim 30, a product claim.

In the Final Action the Examiner refused claim 29 (another product claim) and claim 30 in view of the United States patent 1,355,224 to Gravell, dated Oct. 12, 1920. Claims 29 and 30 read:

- :
- 29. An explosively bonded product comprising at least two metal layers of different compositions bonded together by a substantially continuous metallurgical bond.
 - 30. An explosively bonded product comprising at least two metal layers of the same compositions bonded together by a substantially continuous metallurgical bond.

In that action the Examiner argued that Gravell discloses an explosively bonded product comprising at least two metal layers bonded together by a substantially continuous metallurgical bond. He went on to say that the weld in Figure 12 of Gravell is produced by explosive impact where the heat and pressure produces the weld. The particular nature of the weld in Gravell however, is not described.

In response to the Final Action the Applicant argued that Gravell has not taught "explosive welding," but only welding using a heat source i.e. a pyrotechnic or burning composition. He goes on to say that his method involves the bonding together of metal surfaces by causing the surfaces to collide at great speed and under great pressure so that an amount of air or other gas interposed between the surfaces is suddenly compressed, giving rise to a rapid increase in temperature of the gas. This causes the adjacent metal surfaces to soften and fuse together under the applied pressure. He maintains that Gravell's method does not employ an explosive-generated pressure or force.

The Gravell patent consists of providing a chemical substance which, when ignited, generates a high temperature very rapidly so that the surface or surfaces of metal in contact with the substance is immediately raised to a welding temperature, at which time localized pressure is applied to the heated section, to complete the weld. Gravell goes on to say that he uses a capsule to explode or ignite the ignition power such as fulminate, which is a type of explosive salt. Claim 3 of that patent reads:

The method of spot welding two plates of metal consisting in localizing the heat to a spot or portion only of opposed surfaces of the plates by a heat generating chemical substance and applying a localized pressure immediately over the heated spot to effect the welding of said plates at a spot only of their opposed surfaces.

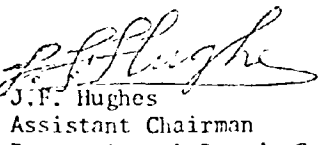
On the other hand we find that the Applicant's welding method involves a detonated explosive charge, different in the sense that it is more of an explosive charge wherein the "metal pieces are hurled together, causing the welding action." There was, of course, no objection to method claims 1 to 28; thus it should follow that the applicant's method is considered new and inventive.

We will now consider the claims. For convenience, claim 29 is reproduced again:

29. An explosively bonded product comprising at least two metal layers of different compositions bonded together by a substantially continuous metallurgical bond.

The weld in the citation also comprises two metal layers of different compositions bonded together by a substantially continuous metallurgical bond. If there are any differences between the two, those differences are produced by the manner in which the weld is produced. Applicant has suggested in his arguments of Feb. 23, 1978, p.2, that there are certain differences. If so, they are the result of the particular way in which the welding is carried out. Because of the difficulty in expressing precisely what those differences may be, this seems to be a case where the product claims should be made dependent upon the process claims. Merely to say the weld is "explosively bonded" fails to properly describe Applicant's product.

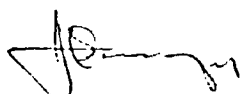
In view of the circumstances we recommend that the application be returned to the Examiner for further prosecution under Section 36(2) of the Patent Act. We do however, recommend that claims 29 and 30 be accepted in "product by process form" if made dependent on the appropriate method claims. The Applicant has indicated that he is willing to consider such claims. A voluntary amendment along these lines will expedite allowance.



J.F. Hughes
Assistant Chairman
Patent Appeal Board, Canada

I concur with the reasonings and findings of the Patent Appeal Board.

The application is returned to the Examiner for resumption of prosecution.



J.H.A. Gariépy
Commissioner of Patents

Dated at Hull, Quebec
this 16th. day of July, 1979

Agent for Applicant

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