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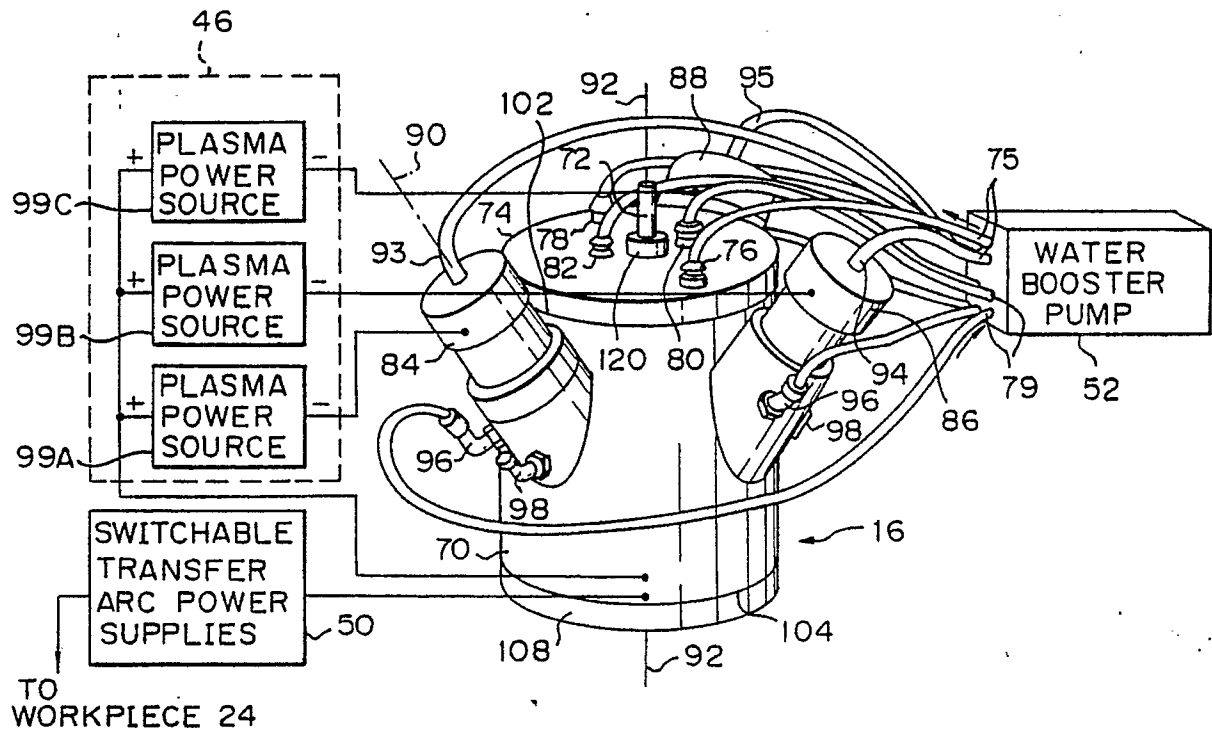
(54) **Modular segmented cathode plasma generator.**

(57) A supersonic plasma system in which a vacuum source creates a low static pressure environment within an enclosure containing a plasma gun (16) and a workpiece (24) has plural cathodes (84, 86, 88) of sealed, modular construction in conjunction with a common anode, to provide higher levels of operating power and other advantages which flow from a segmented cathode gun configuration. Inert gas independently introduced into the plural cathodes (84, 86, 88) undergoes swirling motion over the cathode tips. The anode is of modular construction for easy replacement in order to change the configuration of a nozzle, a plurality of arc chambers receiving the plural cathodes or a central mixing chamber between the nozzle and the arc chambers within the

anode and coupled to a central powder feed (72). The powder feed includes a replaceable insert which includes at least one and preferably a plurality of powder feed ports into the various arc chambers. Alternatively, metal which has already been heated to a molten state can be fed directly into the central mixing chamber. The modular cathodes which are independently powered by separate D.C. power sources (99A, 99B, 99C) are also independently cooled by separate cooling water systems as is the common anode. The cooling systems are configured to produce swirling of the cooling water so that cooling action is maximized.

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Fig. 2





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EUROPEAN SEARCH REPORT

Application Number

EP 89 11 3342

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X,A	WO-A-8 602 024 (REGENTS OF THE UNIVERSITY OF MINNESOTA) * page 9, line 7 - page 12, line 24; figures 1-4 * - - -	1,5,2-4,6	H 05 H 1/44 H 05 H 1/42 H 05 H 1/34 B 05 B 7/22 C 23 C 4/12
A	US-A-3 823 302 (MUEHLBERGER) * column 8, lines 31 - 46; figures * - - -	1-7	
P,A	EP-A-0 297 637 (TECHNISCHE UNIVERSITEIT EINDHOVEN) * abstract; claims 1, 2; figures 1, 2 * - - -	1,8	
P,X	FR-A-2 611 340 (ALUMINIUM PECHINEY) * page 3, lines 16 - 38; figures 2, 4 * - - -	1	
D,A	US-A-3 839 618 (MUEHLBERGER) - - - - -		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H 05 H B 05 B C 23 C
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		30 January 91	ERRANI C.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			