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54 **Method and apparatus for cold sizing a round workpiece having multiple diameters.**

57 A method and apparatus (12) for cold sizing a round workpiece (14) having round surfaces of cylindrical shapes that are coaxial about a central axis A of the workpiece and have different diameters. A support (54,55) rotatably mounts the workpiece (14) about its central axis A between a pair of die assemblies (24a, 24b) which are spaced from each other. Each die assembly (24a,24b) includes a plurality of dies (56,58,60,62) that are respectively aligned with the round surfaces (46,48,50,52) of the workpiece (14). Movement of the die assemblies in opposite directions as each other engages sizing surfaces (66,68,70,72) of the dies with the aligned round surfaces of the workpiece to pressure size the workpiece surfaces. In one embodiment of the sizing apparatus (12), the dies assemblies (24a, 24b) have elongated shapes and are moved rectilinearly in a parallel relationship to each other to perform the sizing. Another rotary embodiment of the sizing apparatus (12') includes rotary die assemblies (24a',24b') mounted by associated spindles (85) whose rotation likewise pressure sizes the round workpiece surfaces. Both embodiments of the sizing apparatus are disclosed as including forming projections for forming projections for forming projections such as splines (82) and/or a helical thread (84) on the sized surfaces of the workpiece.

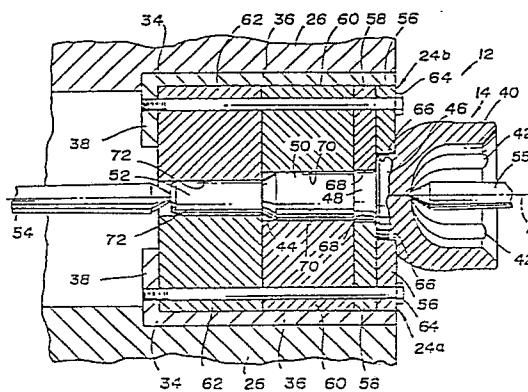


Fig. 2



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. 4)
X	DE-A-3 127 392 (GROB) * claims 1,5,8; figures 2,9,11 * ---	1,3	B 21 H 5/02
X	DE-A-1 602 684 (VEB WERKZEUGMASCHINENFABRIK BAD DÜBEN) * claim 1; figure 2 * ---	1,3	
A	GB-A-1 049 991 (HERBERT) * claims 1,3; figures 1,2 * ---	1,2	
A	US-A-3 044 329 (SEIBERT) * claim 1; figure 4 * -----	1,2	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 21 H 3/00 B 21 H 5/00
Place of search		Date of completion of the search	Examiner
BERLIN		01-07-1988	SCHLAITZ J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p> <p>..... & : member of the same patent family, corresponding document</p>			