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(54) **Expandable ball seat**

(57) Apparatus for a drop ball activated device, where a ball seat (4) is concentrically and axially slidably disposed within an outer sleeve (1) having a first internal cylindrical surface, wherein the ball seat (4) comprises at least one radially extending lug (6), which in a first position extends radially inwards from the internal cylin-

drical surface, thereby defining a first ball seat diameter less than the diameter of the drop ball. The sleeve (1) comprises at least one groove (7) in its internal surface, and the lug (6) may be received in the groove (7), thereby defining a second ball seat diameter at least as large as the diameter of the drop ball (9).

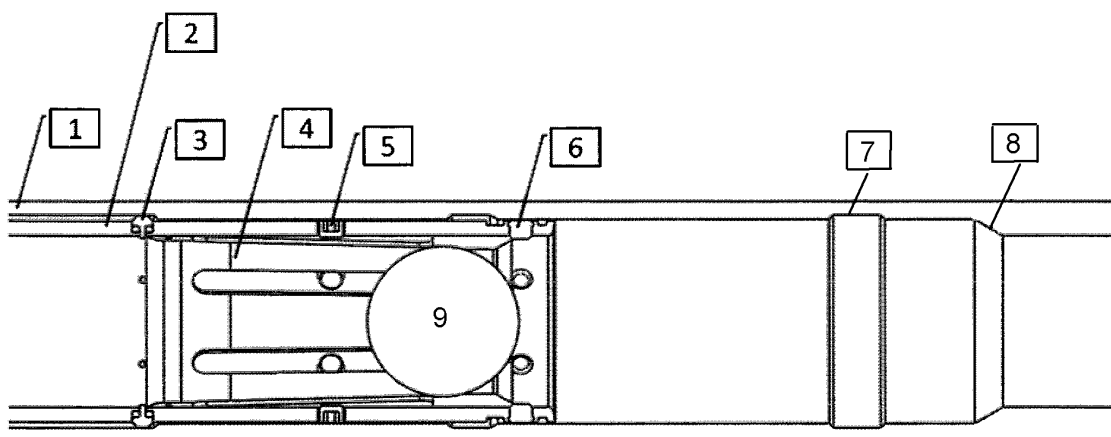


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 11 15 4062

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 862 966 A (LINDSEY HIRAM E [US] ET AL) 5 September 1989 (1989-09-05)	1-9	INV. E21B34/14
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			TECHNICAL FIELDS SEARCHED (IPC)
			E21B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 January 2014	Examiner Simunec, Duro
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82