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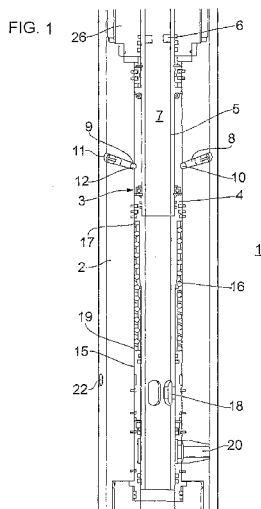
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(57) Abstract: The controller comprises housing (2) within which located is an inner mandrel (4), which is biased in an upward direction by spring (16). Balls (10) in ducts (8) are locking the inner mandrel to housing (2). At a lower end of mandrel (4) are a plurality of ports (18) which may be aligned with a set of outer ports (22). When ports (18) are to be aligned with ports (22), the drill string is rotated, generating a centrifugal force which forces balls (10) radially along ducts (8), thereby unlocking inner mandrel from outer housing. Pressure is then applied to inner duct (7), creating a pressure difference across choke (6). Under sufficient pressure, the force created is sufficient to overcome the resistive force created by spring (16), and thus the inner mandrel translates axially to bring ports (18) in alignment with ports (22), through which some or all of the drilling fluid may flow, by-passing the rest of the drill string.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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E21B

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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| Y | US 3 304 874 A (LYLES) 21 February 1967 (1967-02-21) column 7, line 25 - line 40 | 17,18, 20,21 |
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 Further documents are listed in the continuation of Box C. See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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