CLAIMS

1) Pipe for cableless bidirectional data transmission and the continuous circulation (50) of a stabilizing fluid in a well for the extraction of formation fluids comprising:

- a hollow tubular body (51) which extends in length along a longitudinal direction X and which is configured at the ends for being coupled with respective drill or completion pipes (11) of a pipe string (60);
- a radial valve (52) associated with said tubular body (51) arranged to control the flow of the stabilizing fluid in a substantially radial or transversal direction with respect to the longitudinal direction X, said radial valve (52) being a pressure-tight valve with safety cap and being connectable to a pumping system (40) of a drilling rig (10) outside said tubular body (51) so as to allow the passage of the stabilizing fluid inside said hollow body generating an inside flow directed towards the bottom of the well;
- an axial valve (53) associated with said tubular body (51) arranged to control the flow of the stabilizing fluid along said longitudinal direction X;
- a communication module (20) associated with said tubular body (51) comprising:
- at least one metal plate (21,22,35) selected from:
- a transmitting metal plate (21);
- a receiving metal plate (22);
- a transceiver metal plate (35);
- an electronic processing and control unit (23) configured for processing signals to be transmitted by means of said at least one metal plate (21, 35) or signals received by means of said at least one metal plate (22, 35);
- one or more supply batteries (24) for feeding said metal plates (21, 22, 35) and said electronic processing and control unit (23);

the one or more supply batteries (24) and the electronic processing and control unit (23) are housed in one or more first housings (54) that are closed towards the outside of the tubular body, the at least one metal plate (21,22,35) are housed in at least one second housing (55) that is open towards the outside of the tubular body, the one or more first housings and the at least one second housing extend alog the longitudinal direction X;

said signals being transmitted between said communication module (20) and a consecutive communication module (20) that can be positioned at pre-established intervals of one or more drill or completion pipe (11) wherein the transmission of said signals takes place by injecting into the fluid surrounding the pipe string (60), from said at least one metal plate (21, 35), an electric current carrying an information signal.

2) Pipe for cableless bidirectional data transmission and the continuous circulation (50) of a stabilizing fluid in a well for the extraction of formation fluids according to claim 1, wherein said communication module (20) comprises at least one transmitting coil (25) and at least one receiving coil (26) coaxial with respect to each other and coaxial with respect to the longitudinal axis of said tubular body (51).

3) Pipe for cableless bidirectional data transmission and the continuous circulation (50) of a stabilizing fluid in a well for the extraction of formation fluids according to claim 2, wherein said at least one transmitting coil (25) and said at least one receiving coil (26) are superimposed with respect to each other.

4) Pipe for cableless bidirectional data transmission and the continuous circulation (50) of a stabilizing fluid in a well for the extraction of formation fluids according to ~~any of the previous claims,~~ claim 4, wherein ~~said supply batteries (24) and said electronic processing and control unit (23) are housed in the first housing (54) of said tubular body (51), whereas said at least one metal plate (21, 22, 35) and~~ said at least one transmitting coil (25) and said at least one receiving coil~~s~~ (25, 26) are housed in the at least one second housing (55) of said tubular body (51).

5) Pipe for cableless bidirectional data transmission and the continuous circulation (50) of a stabilizing fluid in a well for the extraction of formation fluids according to claim 4, wherein said first housing (54) and said second housing (55) are located in the longitudinal direction X below said radial valve (52).

6) Pipe for cableless bidirectional data transmission and the continuous circulation (50) of a stabilizing fluid in a well for the extraction of formation fluids according to claim 4, wherein said first housing (54) is located at said radial valve (52) whereas said second housing (55) is located at said axial valve (53).

7) Pipe string (60) for a drilling rig of a generic well for the extraction of formation fluids comprising a plurality of pipes (11, 50) connected to each other in succession, said plurality of pipes (11, 50) comprising a plurality of drill or completion pipes (11) and a plurality of pipes for cableless bidirectional data transmission and continuous circulation (50) according to any of the previous claims having a length shorter than that of said drill or completion pipes (11).

8) Pipe string (60) according to claim 7, wherein said pipes for cableless bidirectional data transmission and continuous circulation (50) are positioned between two drill or completion pipes (11) at predetermined intervals of one or more drill or completion pipes (11).