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(54) Title: GASIFICATION OF HIGH ASH, HIGH ASH FUSION TEMPERATURE BITUMINOUS COALS

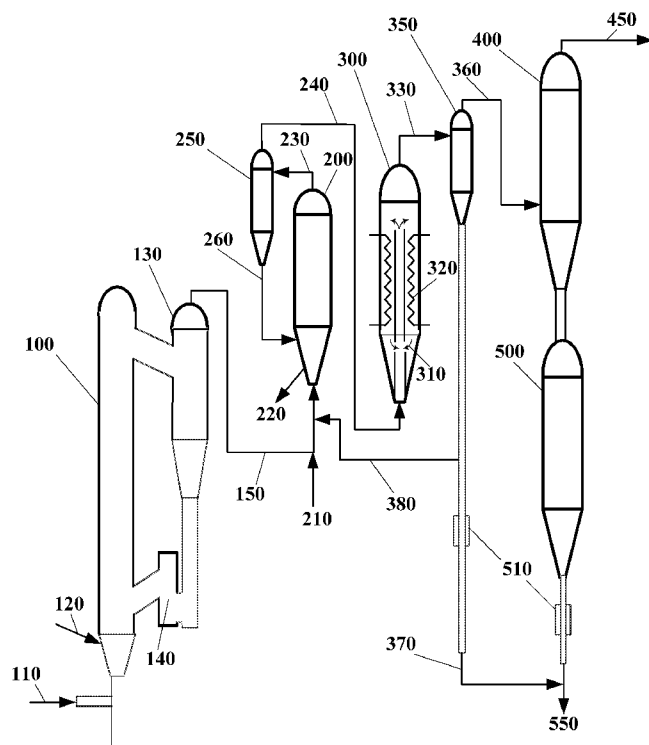


Fig. 2

(57) Abstract: This invention relates to gasification of high ash bituminous coals that have high ash fusion temperatures. The ash content can be in 15 to 45 weight percent range and ash fusion temperatures can be in 1150°C to 1500°C range as well as in excess of 1500°C. In a preferred embodiment, such coals are dealt with a two stage gasification process - a relatively low temperature primary gasification step in a circulating fluidized bed transport gasifier followed by a high temperature partial oxidation step of residual char carbon and small quantities of tar. The system to process such coals further includes an internally circulating fluidized bed to effectively cool the high temperature syngas with the aid of an inert media and without the syngas contacting the heat transfer surfaces. A cyclone downstream of the syngas cooler, operating at relatively low temperatures, effectively reduces loading to a dust filtration unit. Nearly dust- and tar-free syngas for chemicals production or power generation and with over 90%, and preferably over about 98%, overall carbon conversion can be achieved with the preferred process, apparatus and methods outlined in this invention.



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