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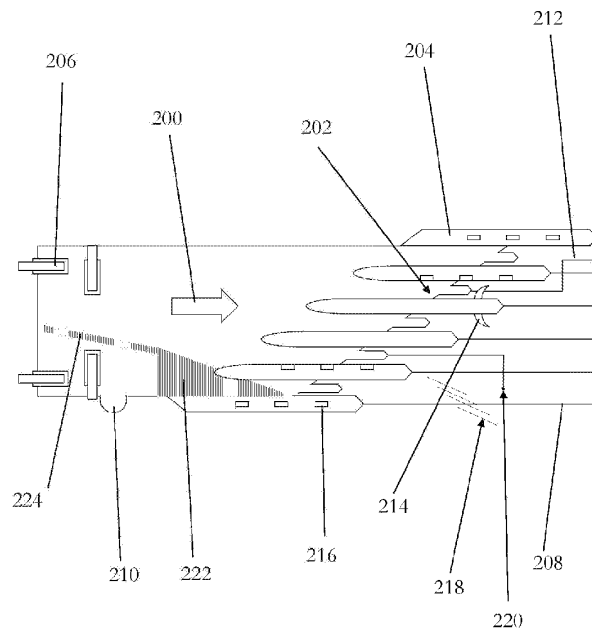
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(54) Title: TUNNELLING SHIELD

[Fig. 4]



(57) Abstract: Tunnel Boring Machines (TBMs) are known that comprise a large metal cylindrical shield fronted by a rotating cutting wheel and containing a chamber where the excavated soil is deposited (and optionally mixed with slurry for extraction, depending on the type of geological/soil conditions). However, TBMs have various disadvantages including the stop-start nature of their tunnelling, and that a single TBM cannot easily transition between different rock/soil types (especially heavily fractured and sheared rock layers). The invention provides a tunnelling shield provided with jet grouting tools arranged to project from a leading edge thereof. In this way, the quality of the geological material into which the tunnel is being excavated may be improved dynamically as part of the excavation process.

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