NATIONAL UNIVERSITY OF SINGAPORE
ESP5402—TRANSPORT PHENOMENA IN ENERGY SYSTEMS
(12:00-13:00; 12 APRIL 2020)
OPEN BOOK QUIZ

Answer the following questions **as detailed and as elegantly as possible***. Hand in your answers in hardcopy and upload your COMSOL code to LumiNUS latest 13:10. Use of Internet is not allowed.

1. Find and visualise the velocity field and momentum flux distribution with a shell balance for flow between a stationary-upper and a moving-lower plate. The lower plate moves with speed, *V*, and the distance between plates is *H*. **(5 marks)**
2. Formulate a mathematical model and solve it with COMSOL Multiphysics for the flow field shown below. Analyse and comment. What is so special with this patent? **(15 marks)**

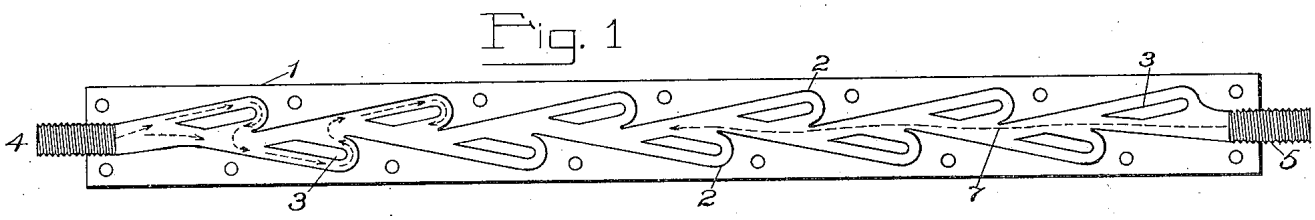

Fig. 1: Flow field machined into a block (patent from 1920).

* Points will be deducted for "sloppy" solutions that are poorly narrated or poorly presented.