(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :20/09/2024

(21) Application No.202441071142 A

(43) Publication Date : 04/10/2024

(54) Title of the invention : Analysis of Cattaneo-Christov model in MHD radiative flow of Casson-Carreau nanofluid past a stretched sheet with chemical reaction

(51) International classification	:B29B0007820000, G06F0119080000, G01N0025180000, G06F0030200000, B05B0017060000
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

(71)**Name of Applicant :**

1)Dr. M. Vinod kumar Reddy

Address of Applicant :Assistant Professor,H&S (Mathematics) Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Medchal-Malkajgiri-500100. State:Telangana Email ID & Contact Number:vinodmulinti15@gmail.com& 8008652183 Secunderabad ---------- ----------

2)Malla Reddy Engineering College

Name of Applicant : NA

Address of Applicant : NA

(72)**Name of Inventor :**

1)Dr. M. Vinod kumar Reddy

Address of Applicant :Assistant Professor,H&S (Mathematics) Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Medchal-Malkajgiri-500100. State:Telangana Email ID & Contact Number:vinodmulinti15@gmail.com& 8008652183 Secunderabad ---------- ----------

2)Dr. G. Bhaskar Reddy

Address of Applicant :Associate Professor, Department of Science & Humanities, A. M. Reddy Memorial College of Engineering and Technology, Narasaraopeta-522601. State: Andhra Pradesh Email ID & Contact Number:drgbhaskarreddy@gmail.com&7981279255 Narasarao peta ---------- ----------

3)Dr. K. Ramakrishna Reddy

Address of Applicant :Associative Professor, H&S (Mathematics) Dept., CMR institute of Technology, Kandlakoya (V), Medchal(Dt), Hyderabad-501401. State: Telangana Email ID & Contact Number:ramakrish.kakarla@gmail.com& 9440521116 Secunderabad ---------- ----------

4)M. Venkataramana

Address of Applicant :Assistant Professor, H&S (Mathematics) Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Medchal-Malkajgiri-500100. State:Telangana Email ID & Contact Number: vramanareddy.m85@gmail.com& 9393935646 Secunderabad ---------- ----------

5)Pavani AedutlaBala Lakshmi

Address of Applicant :Lecture in Mathematics, (Mathematics) Dept., KVR Govt. College for Women, Kurnool-518004. State: Andhra Pradesh Email ID & Contact Number:pavani.abl2006@gmail.com&9493101386 Kurnool ---------- ----------

6)Dr.K.Venugopal Reddy

Address of Applicant :Assistant Professor, (Mathematics) Dept., Anurag University,Medchal-Malkajgiri-500088. State: Telangana Email ID & Contact Number:venugopalreddy.maths@anurag.edu.in&7382550136 Secunderabad ---------- ----------

7)Dr. V. Pavankumari

Address of Applicant :Assistant Professor, H&S (Mathematics) Dept., G. Narayanamma Institute of Technology and Science, Shaikpet Rd, Ambedkar Nagar, Hyderabad-500100. State:Telangana Email ID & Contact Number:pavan.stat@gmail.com&9553266648 Hyderabad ---------- ----------

8)T. Jhansi

Address of Applicant :Assistant Professor, H&S (Mathematics) Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Medchal-Malkajgiri-500100. State:Telangana Email ID & Contact Number: jhansithota1997@gmail.com & 9515644303 Secunderabad ---------- ----------

9)Dr.M. Amulya

Address of Applicant :Assistant Professor, H&S (Mathematics) Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Medchal-Malkajgiri-500100. State:Telangana Email ID & Contact Number: mothrapuamulya97@gmail.com& 9550659292 Secunderabad ---------- ----------

10)Nunna Kavya Sri

Address of Applicant :Assistant Professor, H&S (Mathematics) Dept., Malla Reddy Engineering College, Maisammaguda (Post. Via. Kompally), Medchal-Malkajgiri-500100. State:Telangana Email ID & Contact Number: kavyasri1998nunna@gmail.com& 9063377795 Secunderabad ---------- ----------

(57) Abstract :

3. Abstract: This work investigates the MHD flow of Casson and Carreaunanofluids under the impact of thermal radiation, chemical reaction, suction/injection, and over a stretching sheet in a porous media with Cattaneo-Christov double diffusion. Brownian motion, thermophoresis effects, and viscous dissipation are also taken into account. The appropriate variables are implemented to transform the governing PDEs into a system of ODEs. The bvp5c Matlab package is used to explain the generated equations. Using figures and tables, the impacts of the dimensionless parameters on the mass, heat, and flow transfer physiognomies are examined in detail. It is observed that the thermal field decreases with improvements in the thermal relaxation parameter. Additionally, we observed that the heat exchange rate increases with increasing radiation parameter and decreases with increasing Eckert number, Brownian motion, and thermophoresis factors. We also verified our findings for specific instances of the problem. The investigation results validate important applications in the fields of biomedical, engineering, and industry, such as food processing, material processing, power generation, petroleum production, plastic, glass fiber production and rubber production.

No. of Pages : 18 No. of Claims : 1