
Analysis of perspective designs of truck bearing systems on the example of patents of world manufacturers

© A.Yu. Gorbunov, A.A. Smirnov

Bauman Moscow State Technical University, Moscow, 105005, Russia

The article presents the analysis of the most significant inventions in the field of vehicle bearing systems from the world leading automakers and automotive component manufacturers. The most rational and technological designs of frames, cross members, side members, subframes are described. The basic approaches applied to their development are explained. Attention is paid to the distinction between vehicle bearing systems with dependent and independent suspension. Constructive solutions providing the necessary strength, durability and protection of components and assemblies during vehicle operation are described. The basic development trends in the field of truck bearing systems are formulated.

Keywords: *patent research, patent search, bearing system, frame, side member, cross member, independent suspension module.*

REFERENCES

- [1] Fashiev Kh.A., Pavlenko P.D. Valkova G.N. *Rama transportnogo sredstva* [Vehicle frame]. Patent no. 2025371 RF, IPC B 62 D 21/02. The applicant and patent holder: JSC (joint stock company) "KamAZ", appl. 15.02.94, publ. 30.12.94, 3 p.
 - [2] Komarov V.V., Sultanov S.F. *Rama transportnogo sredstva* [Vehicle frame]. Patent no. 2176606 RF, IPC B 62 D 21/02. The applicant and patent holder: JSC (joint stock company) "KamAZ", appl. 07.02.2000, no. 2000102962/28, publ. 10.12.2001, 2 p.
 - [3] Polyakov V.V., Timofeev V.M., Sultanov S.F. Kalimullin A.R. *Rama gruzovogo avtomobilya* [Truck Frame]. Patent no. 130943 RF, IPC B 62 D 21/02. The applicant and patent holder: JSC (joint stock company) "KamAZ", appl. 18.03.2013; publ. 10.08.2013, 2 p.
 - [4] Rachkov R.V., Filippov V.A., Chekodaev A.A. *Rama transportnogo sredstva* [Vehicle frame] Patent no. 142042 PF, IPC B 62 D 21/02. The applicant and patent holder: JSC (joint stock company) "KamAZ", appl. 24.02.2014, no. 2014106806/11, publ. 20.06.2014, 2 p.
 - [5] Ertelt Ch., Ubelacker A. *Front Cross-Member of a Commercial Vehicle* [In Russian: Perednyaya poperechina gruzovogo transportnogo sredstva]. Patent no. EP 2138381 Germany, IPC B 62 D 21/02. The applicant and patent holder: MAN Nutzfahrzeuge AG, appl. 30.04.2009, no. 09005966.8, publ. 30.12.2009, 9 p.
 - [6] Eberle A., Lamche O., Jablonski S., Kreisel M., Preisker R., Ziehlke Ju. *Chassis for a Commercial Vehicle with a Multi-Function Bearer Block* [In Russian: Rama kommercheskogo avtomobilya s modulnym mnogofunktsionalnym nesuschim blokom]. Patent no. EP 2159135 Germany, IPC B 62 D 21/02, B62D 31/02, B62D 27/02, B62D 47/02. The applicant and patent holder: MAN Nutzfahrzeuge AG, appl. 15.07.2009, no. 09009192.7, publ. 03.03.2010, 18 p.
 - [7] Sattler S., Hintereder Ju. *Chassis Structure with damper for Utility Vehicle* [In Russian: Prostranstvennaya konstruktsiya ramy dlya gruzovogo avtomobilya]. Patent no. EP 2684778 (A2) Germany, IPC B 62 D 21/06. The
-

-
- applicant and patent holder: MAN Truck & Bus AG, appl. 9.03.2013, no. 20130001183; publ. 15.01.2014, 7 p.
- [8] Beuss H., Sonsalla N., Stockklausner W. *Front Spring Bracket for a Truck* [In Russian: Peredniy dempfiruemyy kronshtein dlya gruzovogo avtomobilya]. Patent no. EP 2257459, IPC B 62 D 21/15. The applicant and patent holder: Daimler AG, appl. 17.03.2009, no. 20090728622, publ. 23.07.2014, 2 p.
- [9] Cordea T. *Light-Weight, Roll-Bonded HeavyDuty Truck Frame Member* [In Russian: Legkiy sostavnoy element ramy tyazhelykh gruzovykh avtomobiley]. Patent no. US 0018248 A1, IPC B62D21/02, B62D 21/04, B21D 53/88. The applicant and patent holder: International Truck Intellectual Property Company, appl. 27.07.2009, no. 12/509,927, publ. 27.01.2011, 7 p.
- [10] Rowe R., Schmiedel G. *Vehicle Frame* [In Russian: Rama transportnogo sredstva]. Patent no. US 0071466, IPC B 62 D 21/17. The applicant and patent holder: Oshkosh Truck Corporation, 27.09.2004, no. 10/950,964, publ. 06.04.2006, 9 p.
- [11] Schreiner M., Roehl S., Pelko D. *Axle Assembly* [In Russian: Os v sbore]. Patent no. US 0079978, IPC B 62 G 9/00, B 62 D 25/20, B 23 P 11/00. The applicant and patent holder: Oshkosh Truck Corporation, appl. 17.09.2010, no. 12/885,125, publ. 07.04.2011, 28 p.
- [12] Cordier G., Cantuern L., Mella P., Courvoisier A. *Modular Independent Suspension and Method of Producing the Same* [In Russian: Modul nezavisimoy podveski i metod ego izgotovleniya]. Patent no. EP 2581240 Germany, IPC B 60 G 3/20, B 60 G 7/02, B 60 K 17/16, B 62 D 21/18. The applicant and patent holder: AxleTech International IP Holdings, appl. 10.10.2012, no. 12188010.8; publ. 17.04.2013, 21 p.
- [13] Cordier G. *Independent Suspension with Adjustable Sub-Frame* [In Russian: Nezavisimaya podveska s reguliruemyym podramnikom]. Patent no. US 7850181 USA, IPC B 60 G 7/02. The applicant and patent holder: AxleTech International IP Holdings, appl. 23.10.2008, no. 11/662,823; publ. 14.12.2010, 9 p.
- [14] Eshelman E., Pavuk G., Weeks G. *Six Link Independent Suspension for a Drive Axle* [In Russian: nezavisimaya podveska vedushey osi]. Patent no. US 7819411 USA, IPC B 60 G 3/20. The applicant and patent holder: Arvin Meritor Technology, appl. 02.05.2006, no. 11/415,668; publ. 26.10.2010, 12 p.

Gorbunov A.Yu., M. Sci. student at the Department of Wheeled Vehicles at Bauman Moscow State Technical University. Research interests: designing units for off-road wheeled vehicles. e-mail: goralex89@mail.ru.

Smirnov A.A., Candidate of Engineering Sciences (Ph.D.), associate professor at the Department of Wheeled Vehicles at Bauman Moscow State Technical University. The author of more than 20 publications in the field of designing units for off-road wheeled vehicles. e-mail: smr_a@mail.ru
