

PATENTOLOGICAL PROSPECTS OF STUDYING THE MEANS OF EXTINGUISHING FOREST FIRES

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The task of effectively extinguishing fires during fires is relevant. Its solution is related to the problem of a safe non-toxic flame arrester. There are various principles for extinguishing fires [1].

Isolation of the source of combustion from the access of air occurs when inert (not supporting the combustion process) gases and other materials are supplied to the combustion zone. In another case, substances that can take heat due to the evaporation process (water, freons) or substances capable of an endothermic decomposition reaction (ammonium phosphate, crystalline hydrates) are fed into the combustion zone. Inhibitors of radical oxidation-reduction processes containing halogens, phosphorus, salts of potassium and sodium.

The use of metal-containing compounds (red and yellow blood salts) [2,3], in particular, 30% aqueous solution of $K_3[Fe(CN)_6]$ (red blood Sol) [4].

As additives to aqueous solutions, when using aerosols, such compounds as NaCl, KCl, LiI, CH_3COOK , $CoCl_2$, $NiCl_2$, NaOH, $NaHCO_3$, $MgCl_2$, $CaCl_2$, $MnCl_2$, $FeCl_2$ and others were added. Some of these compounds have been found to be more effective inhibitors of combustion than freons such as CF_3Br . However, the most effective flame arresters are complex compounds of potassium and iron [5].

A good effect is extinguishing with the help of submicron aerosol of aqueous solutions of red and yellow blood salt. This technology can be used to extinguish large-scale foci of flame, including the fire of a wooden structure and a tank with oil products [6].

It is known that the most effective is the extinguishing of fires of flammable liquids with powder compositions. One of the new proposals of the composite composition of fire extinguishing powders is the introduction of alumino-potassium alum into the composition of the basic salt, which reduces caking and increases the fluidity of the powder. At the same time, fire safety of equipment and apparatus at chemical and oil refineries is optimized [7].

A good effect of extinguishing with powder substances is provided by the inclusion of an additive in their mixture: zinc oxide (dusting of the composition, reduction in caking of the powder, ensuring flowability), potassium alum (provide the necessary fluidity of the mixture) and alumina (helps to cool the combustion zone).

New patent research based on the patentological approach [8] can optimize the creation of modern patent technical solutions for extinguishing forest fires. Patentological approach is used in

the development of new production technologies [9], in the implementation of design developments [10].

Bibliography

1. Baratov A.N. *Fire extinguishing at the enterprises of the chemical and petrochemical industry.* - M.: Chemistry. - 1979. - 368 s.
2. Investigation of organophosphorus, organofluorine, metal-containing compounds and solid-propellant gas-generating compositions with additives of phosphorus-containing compounds as effective flame arresters / Korobeinichev O.P et al. // *Physics of Combustion and Explosion.* - T. 42. - 2006. - № 6. - P. 64–73.
3. Experimental analysis of cup-burner flames / Linteris G.T., Katta V.R., Takahashi F. // *Combust. Flame.* Vol. 138. - 2004. - P. 78–96.
4. Shmakov A.G. et al. EFFECTIVE TECHNOLOGY OF FIRE EXTINGUISHING THROUGH AEROSOLS OF SALT SOLUTIONS. // *GEO-SIBERIA.* -2009. -№2. -P.9-13.
5. Korobeynichen O.P. et al. Investigation of organophosphorus, organofluorine, metal-containing compounds and solid-fuel gas-generating compositions with additives of phosphorus-containing compounds as effective flame arresters, // *Physics of Combustion and Explosion.* - 2006. - T.42. №6. - P. 64-73.
6. Korobeynichen O.P. et al. APPLICATION OF AEROSOL TECHNOLOGY AND EFFECTIVE UNAUTHORIZED PLUSTERS FOR EXTINGUISHING DIFFERENT TYPES OF FIRE. // *GEO-SIBERIA.*-2012.-№3.- P. 92-101.
7. V. L. Adamyan, D. A. Ulmeykin. MINIMIZATION OF CAKING AND FLOW RATE INCREASE OF FIRE EXTINGUISHING POWDERS // *Safety of Technogenic and Natural Systems.*- 2017.- №3.- P.18-22.
8. Evstropov V.M. General characteristics of the concept of patentology // *International Journal of Experimental Education.* - 2017. - № 4-2. - P. 162-162; URL: <http://expeducation.ru/ru/article/view?id=11477>.
10. Evstropov V.M. PATENTOLOGY AND PRODUCTION TECHNOLOGY. *International Journal Of Applied And Fundamental Research.* - 2017. - No. 3 - URL: www.science-sd.com/471-25229 .
11. Evstropov V.M., Pushenko S.L., Nikhaeva A.V. Patentological Aspects Of Engineering // *International Journal Of Applied And Fundamental Research.* - 2017. - № 3 -URL: www.science-sd.com/471-25360 .

The work is submitted to the International Scientific Conference «Development of Scientific Potential of Higher Education», UAE, Dubai, 4-10 March 2019, came to the editorial office on 16.02.2019