NPP TENZOSENSOR LLC

Forest firefighting robotic complex

РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ИЗОБРЕТЕНИЕ

№ 2677413

СПОСОБ ТУШЕНИЯ ЛЕСНЫХ ПОЖАРОВ И РОБОТИЗИРОВАННЫЙ КОМПЛЕКС ДЛЯ ЕГО ОСУЩЕСТВЛЕНИЯ

Патентообладатель: *Общество с ограниченной ответственностью "Научно-производственное предприятие "Тензосенсор" (RU)*

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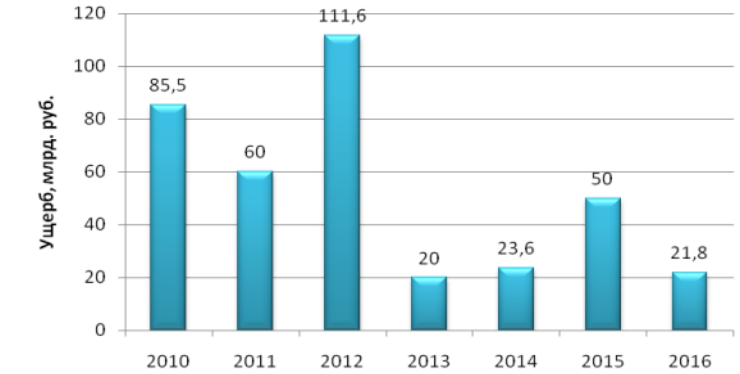
Руководитель Федеральной службы по интеллектуальной собственности

Г.П. Ивлиев

EXTENT OF DAMAGE FROM FOREST FIRES BETWEEN 2010 AND 2016



BETWEEN 2010 AND 2016 LOSSES FROM FOREST FIRES IN THE RUSSIAN FEDERATION TOTALED FROM 20 TO 111.6 BILLION RUBLES ANNUALLY

COMPLEX COMPOSITION AND OPERATION

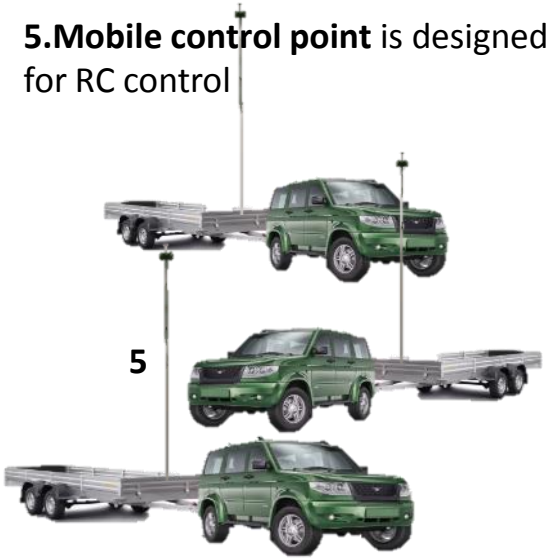
1.Robotic mini harvester performs deadwood felling operations.

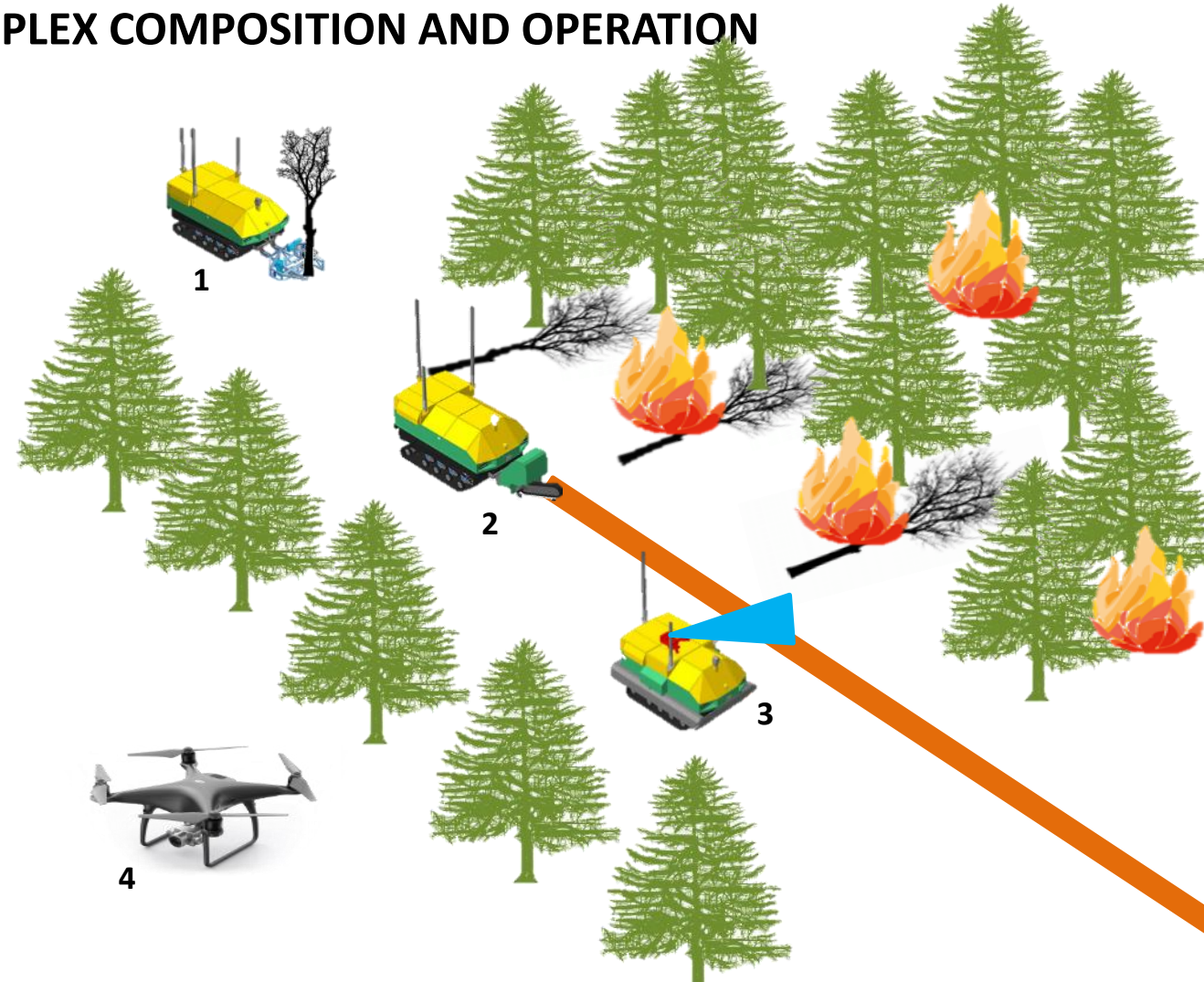
2.Robotic trencher clears a control line.

3.Fire robot extinguishes flames breaking over the control line.

4.Drone monitors operation of the complex and detects occurrences of flame brakeovers.

5.Mobile control point is designed for RC control





ROBOTIC COMPLEX

COMMAND CENTRE

ROBOTS

FIREFIGHTING COMPLEX ROBOTS

Fire robot

Robotic mini harvester

Robotic trencher

ROBOTIC TRENCHER

FIRE ROBOT

ROBOTIC HARVESTER

320 мм

3 MOBILE CONTROL POINT VEHICLES BASED ON UAZ PATRIOT

Operator workstation based on polyjoysticks and video headset

Mobile control point vehicles are designed for remotely controlling the robots in the range of up to 2 km.
The trailer is used for transporting the robot and carrying the radio repeater.

It helps to accommodate powerful receiving and transmitting equipment and computer facilities in a single vehicle, provide a user-friendly environment for all RC team members, and avoid interference between operators working together.

MOBILE CONTROL POINT

UNIFIED HUMAN-MACHINE INTERFACE (POLYJOYSTICKS AND VIDEO HEADSET)

Inexpensive off-the-shelf unified interface with extensive functionality can be used for controlling any robotic equipment – from ground robots to aerial vehicles

The interface comprises two polyjoysticks and a video headset

Polyjoysticks cost less than joysticks and outmatch all modern control means for robotics. There are five optical mini joysticks installed on each polyjoystick making it possible to control objects with up to 20 degrees of freedom.

The video headset ensures optimum field of view and equipment control conditions.

INTERFACE ADVANTAGES

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1 Next generation interface substitutes all displays, buttons and joysticks, has the smallest possible size, is light-weight, easy to control and has the minimum cost.

2 Production of the interface elements is being implemented at enterprises of Rostekh group.

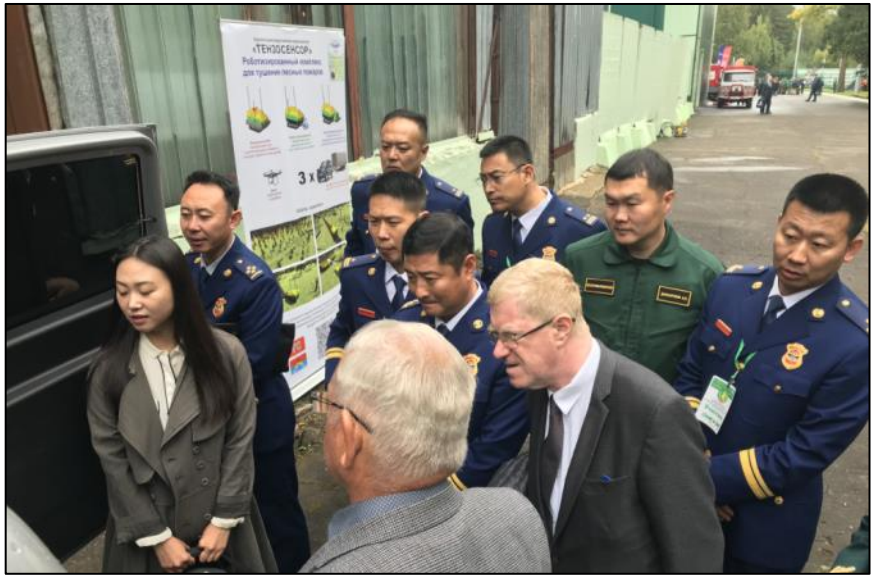
Russian forest 2018 exhibition (Vologda)

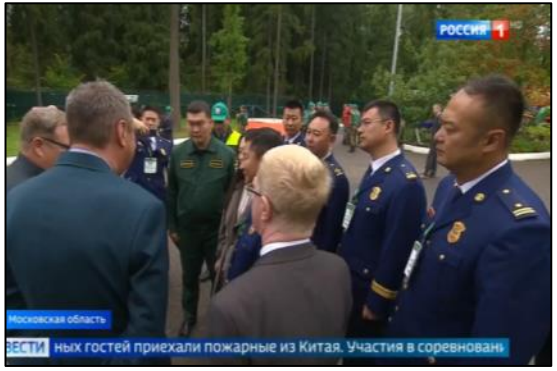
The robotic trencher is being presented to the governor of Vologda region O. A. Kuvshinnikov by N. A. Kovalev, Deputy Head of *Avialesookhrana* Federal State-Funded Institution

ROBOTS PRESENTED TO THE MINISTER FOR EMERGENCIES AND TO THE GOVERNOR OF YAROSLAVL REGION

ROBOTS PRESENTED TO SENIOR OFFICIALS OF AERIAL FOREST FIRE CENTER, FEDERAL FORESTRY AGENCY AND EMERGENCIES MINISTRY

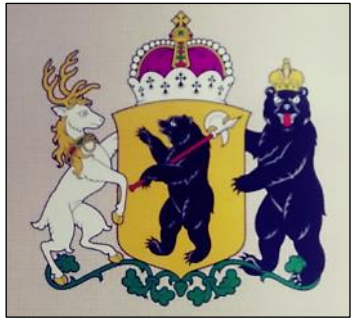
ROBOTS PRESENTED TO SENIOR OFFICIALS OF CHINESE FOREST FIREFIGHTING AGENCIES





1. Sun Xinchun – Chief of Staff, forest firefighting brigade, Heilongjiang province.
2. Liu Xuefeng – Acting Head of Great Hingan Division, Inner Mongolia forest firefighting brigade.
3. Zhen Dezhong – Head of Training Department, forest firefighting brigade headquarters, Sichuan province.
4. Wang Lei – Head of Training Department, forest firefighting brigade headquarters, Yunnan province.
5. Fuying Xian – Head of Training Department, forest firefighting brigade headquarters, Gansu province.
6. Xu Wengteng – Headquarters employee, Department of Headquarters Staff Training, Forest Fire Department.

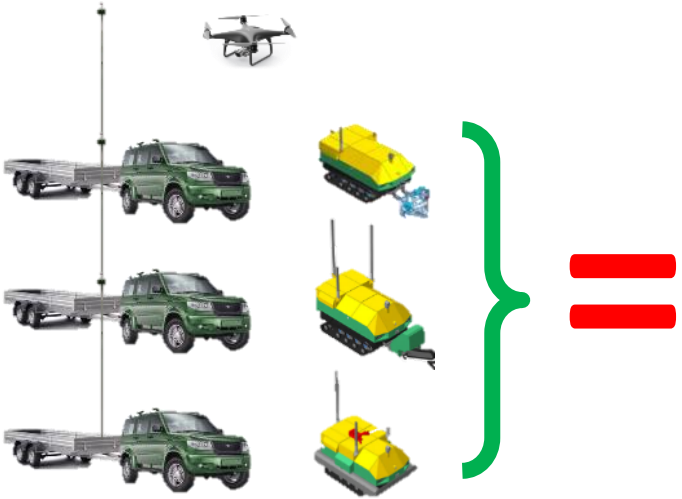
PROJECT DEMONSTRATION TO SENIOR OFFICIALS OF YAROSLAVL REGION AND MSP CORPORATION ON THE PREMISES OF YAROSLAVL REGIONAL GOVERNMENT



Корпорация МСП

МСП Банк

COMPLEX EFFICIENCY



The complex being developed will improve firefighter productivity by 5.7 times. In terms of productivity it is equivalent to a firefighting crew comprising 57 persons.

100 complexes and 1,000 firefighters will be identical to a firefighting brigade comprising 5,700 persons.

At the same time, forest firefighters safety will be much higher.

COMMERCIAL OFFER

NPP Tenzosensor **is looking forward to cooperation in the field of sales organization and market promotion for the innovative products shown in the presentation**

NPP TENZOSENSOR

Registered capital 29.4 million rubles Based in Rybinsk.

THANK YOU FOR YOUR ATTENTION