FP:("COMPANIA NAŢIONALĂ ROMARM S.A.")

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1. **135740** INNOVATIVE SPECTRAL PYROTECHNICAL COMPOSITIONS FOR THERMAL COUNTERMEASURES OF FLARE TYPE — RO - 30.05.2022

Int.Class C06B 29/02 **Appl.No** 2021000750 **Applicant** COMPANIA NAŢIONALĂ ROMARM S.A. **Inventor** CRISTEA VALENTIN

The invention relates to spectral pyrotechnic compositions for making flare-type aerial thermal countermeasures and to a method for preparing them. According to the invention, the pyrotechnic composition consists of the following components, expressed in percentage by weight: a. 35...55% potassium perchlorate with a granulation <90 μm used as oxidant, b. the fuel consists of 20...45% Mg-Al alloy Magnalium with a granulation <63 μm or Al powder with a granulation of 4...5 μm, or a mixture of Mg powder with a granulation <63 μm with Al powder with a granulation of 4...5 mu m mixed in a ratio 50:50, c. 2...8% di-butyl phthalate, di-octyl phthalate, di-isooctyl phthalate, di-isononyl phthalate, di-butyl maleate, di-isobutyl maleate used as plasticizers, d. 10...15% polyurethane binder consisting of polyol based on solvent-free castor oil and aromatic polyisocyanate based on solvent-free di-phenyl-methane-diisocyanate, e. 2...8% halogenated binder which can be Teflon - polytetrafluoroethylene powder $[C_2F_4]_2$, Viton powder - fluorinated copolymer of hexafluoropropene or tetrafluoroethylene with vinyl or vinylidene fluoride, chlorinated rubber powder with the degree of chlorination between 40...60% - monocomponent system and f. 3...6% acetone of 99.5% purity as organic solvent. According to the invention, the preparation method consists in drying the potassium perchlorate at 80°C for 24 hours, followed by sieving it through a sieve with a mesh size of max. 300 μm, after which a homogeneous mixture of metal powders, organic binder and plasticizer is prepared, over which the potassium perchlorate is added while stirring lightly, then the acetone and the polyurethane binder are added, and the whole mixture is homogenized in a mixer with screws and baffles, the polyurethane binder being prepared separately by mixing the polyol with the polyisocyanate, no later than 15 minutes before addition, after which the resulting homogeneous mixture is poured into moulds where it is stored for 24 hours.

2. **135748** A NEW MANUFACTURING CONCEPT FOR CARRYING OUT PIERCING ENVELOPES OF THERMOBARIC PROJECTILES OF CALIBER 73 MM FOR GRENADE LAUNCHER AG-9 WITH OPTIMIZED BALLISTIC PERFORMANCES — RO - 30.05.2022

Int.Class C22C 22/00 **Appl.No** 2021000749 **Applicant** COMPANIA NAŢIONALĂ ROMARM S.A. **Inventor** PÎRVU TIBERIU

The invention relates to a process for manufacturing penetrating envelopes of thermobaric piercing projectiles of 73 mm caliber for the AG - 9 grenade launcher. According to the invention, the process comprises the following stages: a. smelting a steel 5Mn125 in a furnace with controlled atmosphere CIA + VAR while treating in the desulphurisation and dephosphating pot and pouring it into the ingot, the steel having the following composition, expressed as percentage by weight: C <0.05%, 11...14% Mn, 1.7...2.0% Ni, 0.8...1.2% Mo, 0.8...1.2% Ti, 0.05...0.10% Si, S <0.0035%, P <0.001%, O <0.022%, N <0.001%, 0.2...0.3% Al, 0.05...0.1% V, 0.03...0.05% Nb and B <0.003, the steel exhibiting a favourable combination between two metallurgical characteristics: TRIP effect and Maraging effect, b. hot forging of the ingot up to a diameter Φ = 75 mm followed by hardening, the heating temperature being 1100°C and the final transformation temperature of 950°C, c. mechanically cutting the ingot as washers with the size Φ 75 mm X 20 mm, d. reverse extrusion of the washers in order to produce a semi-finished product with the size of Φ 75 mm X Φ 62 mm X 200 mm, the heating temperature being 1100°C and the cooling in water, e. the stage of putting into solution is carried out by heating the semi-finished product to a temperature of 1040°C and maintaining it for 1 hour and cooling it in water, f. TRIP conditioning, i.e. the transformation of austenite into martensite takes place in two stages of molding and cold pressing in a hydraulic press of 400 tf, g. the Maraging treatment i.e. the heat treatment of precipitation taking place at a temperature of 480°C for 6 hours, in air and h. carrying out the final size of the projectile by mechanical processing followed by ultrasonic control US of the material structure.

3. **135747** TECHNOLOGY FOR MANUFACTURING BARS OF MARAGING 300 STEEL HARDENABLE BY PRECIPITATION FOR MAKING A PROJECTILE OF CALIBER 30 MM — RO - 30.05.2022

Int.Class C22C 1/02 **Appl.No** 2021000721 **Applicant** COMPANIA NAŢIONALĂ ROMARM S.A. **Inventor** BRATU CRISTIAN MIHAI ION

The invention relates to a process for manufacturing bars of Maraging 300 steel hardenable by precipitation, required for producing armour-piercing tracer projectiles - of caliber 30 mm of AP-T type. According to the invention, the process has the following steps: 1. smelting a Maraging 300 steel in a vacuum induction furnace CIA followed by double remelting in a vacuum atmosphere on the VAR installation and ingot casting; 2. hot rolling or forging the ingot until an electrode with a diameter Φ = 50 mm in annealed and peeled state is obtained, the end deformation temperature being 800°C, with water cooling, 3. applying a soaking heat treatment in a solution at a temperature of 830°C for at least 40 minutes and cooling in water, 4. carrying out a severe plastic deformation in two stages with a reduction of the cross-section from Φ = 50 mm to Φ = 32 mm, the reduction per section being 60%, by cold radial forging with the change of the deformation direction in order for the Bausinger effect to occur and develop as follows: a first stage of cold deformation with a 42% reduction per section from Φ 50 mm to Φ 42 mm and finally to Φ 38 mm, followed by a change of deformation direction and a second stage of deformation with a 30% reduction per section from Φ 38 mm to Φ 34 mm and finally to Φ 32 mm, 5. heat treatment in a solution at a temperature of 820°C for 15 minutes with cooling in water, 6. precision cutting out at the weight of the projectile of caliber 30 mm with positive tolerances, 7. final cold forming of the projectile by rotary forging with profiled tools, 8. degreasing, 9. final heat treatment with double precipitation at a temperature of 450°C, for 4 hours, with cooling in air, and 10. final dimensional control of the projectile, hardness control per section and metallographic analysis of the grain size structure.