strength (kg/mm^2) = 42.8; after 4 hrs at 170°C in N_2, 41.0 and at 210°C in N_2, 36.5; after 4 hrs at 170°C in air, 39.5, and at 210°C, 14.2. (2) Triphenyl phosphite (I), tri-p-octyl-phenyl phosphite (II), tri-p-dodecyl phenyl phosphite (III), and tri-p-ter-butyl phenyl phosphite (IV) inhibit the thermal decomposition of PET, and increase its molecular weight and stability. The best moment for adding the inhibitor is at 50-70% polycondensation of PET. (3) After 2 hrs at 220°C the breaking strength of PET without inhibitor was 47% the initial value 71% with I, 66% with II, 78% with III, and 75% with IV. The longest induction period and smallest loss in molecular weight were found with IV. The inhibiting effect of phosphites is attributed to the fact that they hydrolyze much more easily than PET which is thus protected against hydrolysis. There are 6 figures and 4 tables. The most important English-language reference is: J. M. Ward, Nature, 80, 141, 142, 1957.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (All-Union Scientific Research Institute of Synthetic Fibers)

Stabilization of polyethylene ...

S/190/62/004/008/008/016
B101/B180

SUBMITTED: May 8, 1961

Card 3/3

USSR

ACCESSION NR: AP3009573 S/0286/63/000/015/0126/0126

AUTHOR: Angert, L. G.; Kirpichnikov, P. A.; Kuz'minskiy, A. S.; Khayrulin, V. K.; Borisova, V. N.

TITLE: Method of preventing aging of raw and vulcanized rubbers. Class 39, No. 151688

SOURCE: Byul. izobret. i tovarn. znakov, no. 15, 1963, 126

TOPIC TAGS: rubber, antioxidant, phosphonic acid, dihydroxyphenyl-, aryl esters

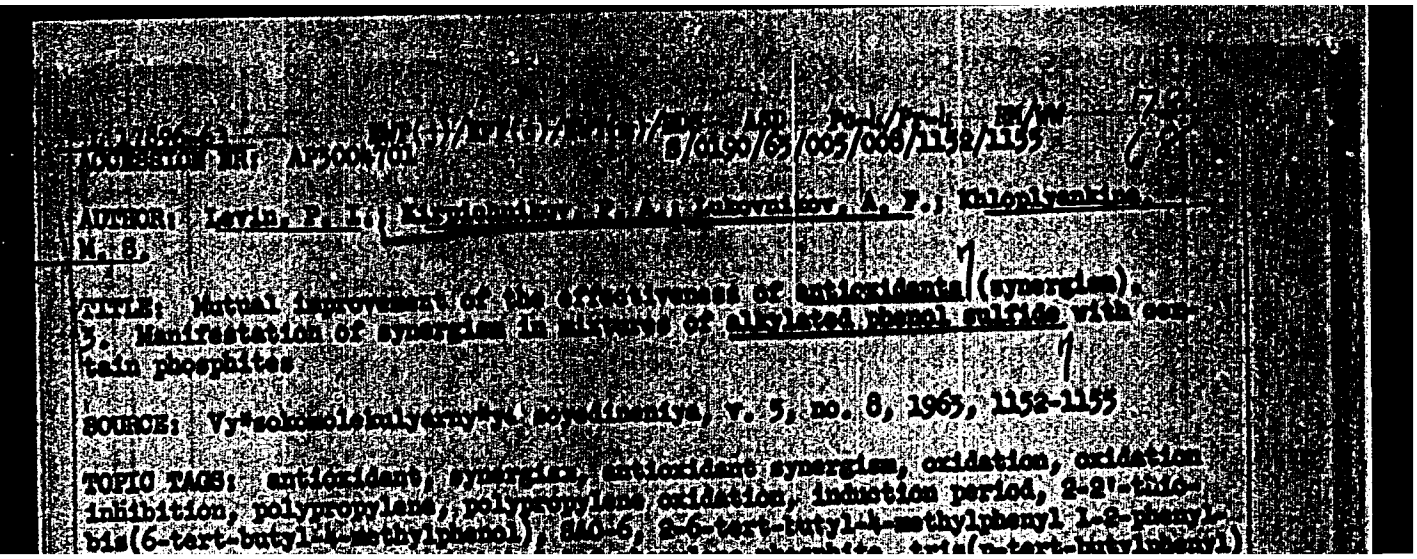
ABSTRACT: An Author Certificate has been issued for a method of using aryl esters of pyrocatecholphosphorous acid [sic] as noncoloring age resistors for raw and vulcanized rubbers.

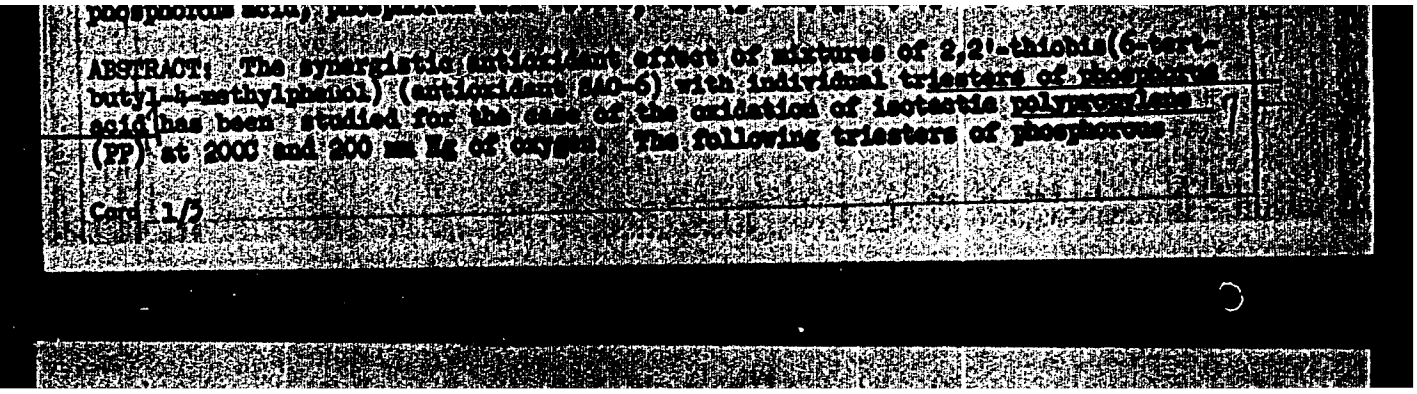
ASSOCIATION: none

SUBMITTED: 28Jul59 DATE ACQ: ~~08Nov~~63 ENCL: 00

SUB CODE: CH NO REF SOV: 000 OTHER: 000

Card 1/1



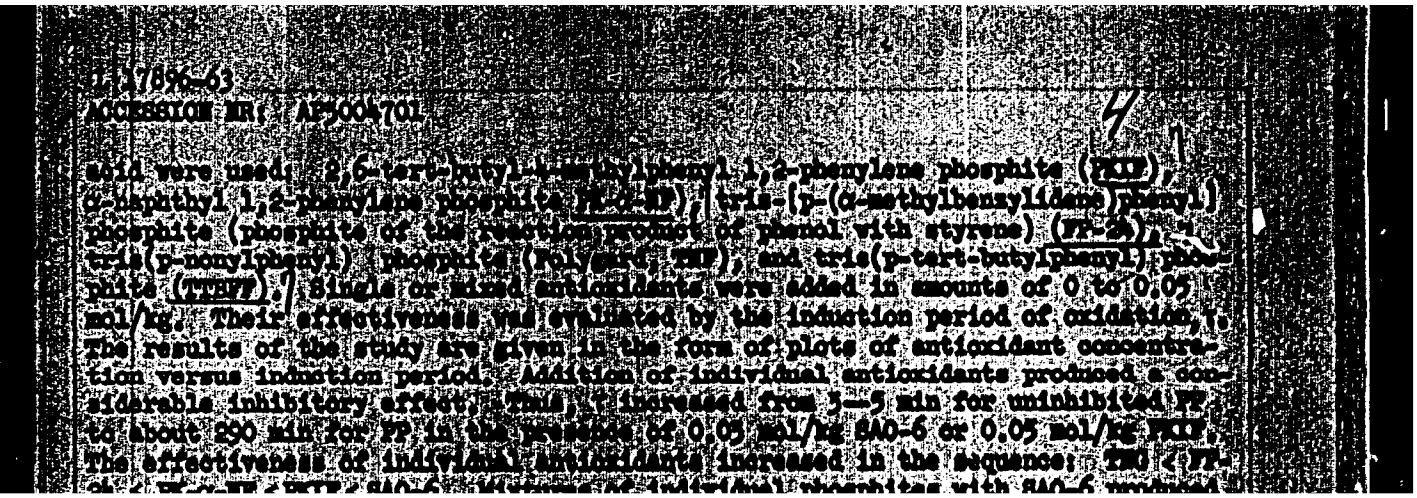


phosphorous acid, [illegible]

ABSTRACT: The synergistic (antioxidant effect of mixtures of 2,2'-thiobis(6-tert-butyl-4-methylphenol) (antioxidant 440-6) with individual triesters of phosphorous acid has been studied for the case of the oxidation of isotactic polypropylene (PP) at 200C and 200 mm Hg of oxygen. The following triesters of phosphorous

Card 1/2

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000722720001-0"



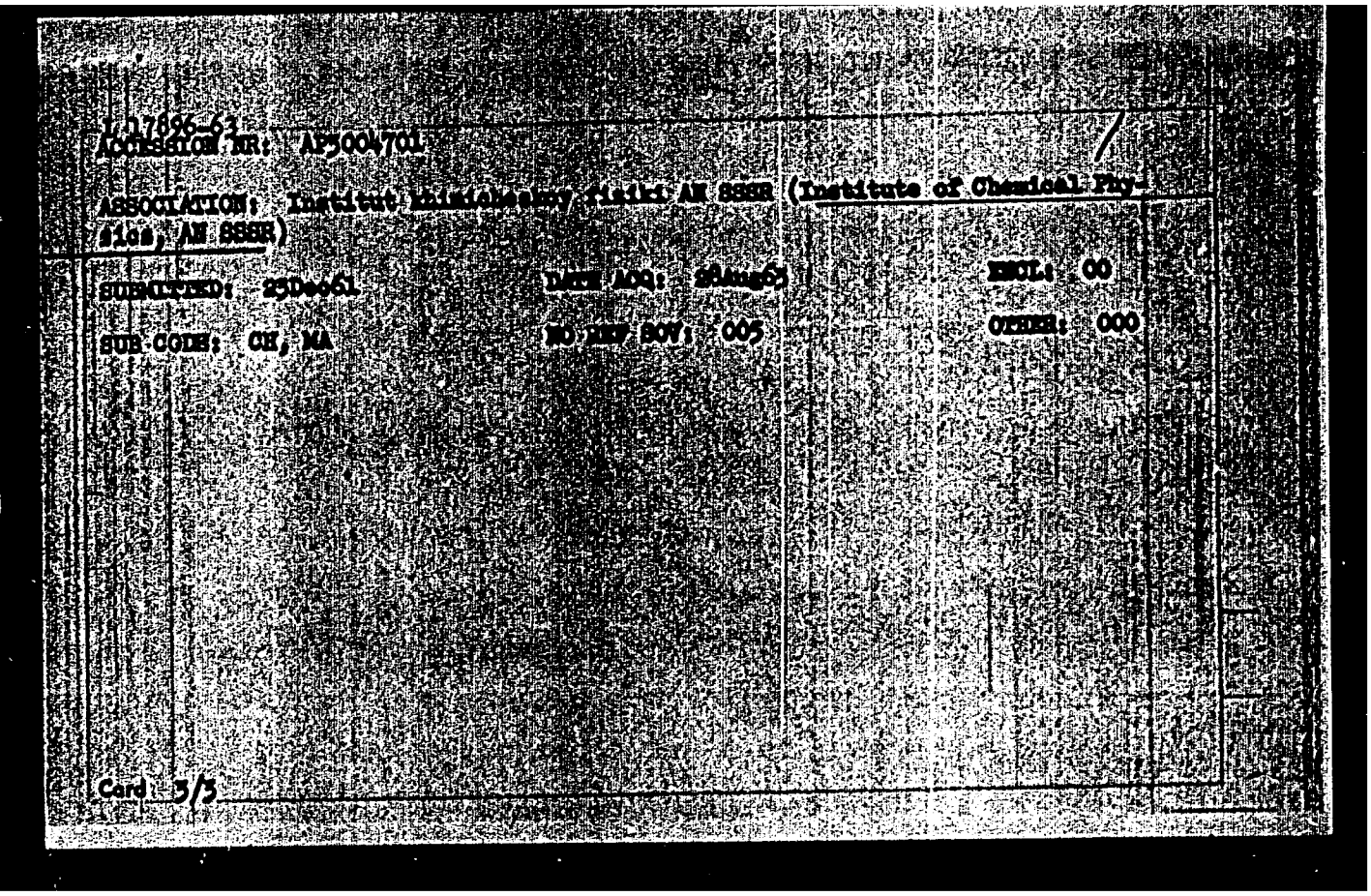
L 47896-63
ACCESSION NR: AP3004701

4

AO-6 were used: 2,6-tert-butyl-4-methylphenyl 1,2-phenylene phosphite (PKU), 6-naphthyl 1,2-phenylene phosphite (PF-2-N), tris-[p-(o-methylbenzylidene)phenyl] phosphite (phosphite of the reaction product of phenol with styrene) (PF-2), tris(p-nonylphenyl) phosphite (TNPP), and tris(p-tert-butylphenyl) phosphite (TTBPP). Single or mixed antioxidants were added in amounts of 0 to 0.05 mol/kg. Their effectiveness was evaluated by the induction period of oxidation. The results of the study are given in the form of plots of antioxidant concentration versus induction period. Addition of individual antioxidants produced a considerable inhibitory effect. Thus, t increased from 3—5 min for uninhibited PP to about 290 min for PP in the presence of 0.05 mol/kg AO-6 or 0.05 mol/kg PKU. The effectiveness of individual antioxidants increased in the sequence: TNP < PP-

The effectiveness of individual antioxidants increased in the sequence: TBU < PF-24 < PK-o-MF < PKTF < SAO-6. Mixtures of individual phosphites with SAO-6 produced a synergistic effect in all cases; the induction period increased in some instances to about 500 min. Long inhibition periods can be obtained not only by increasing the total concentration of the components mixed in a given ratio but also by increasing the concentration of one component at a constant concentration of the other. It is considered that mixtures of SAO-6 with triesters of phosphorous acid are very effective stabilizers of most polymers as PP and that the effectiveness of the mixtures considerably exceeds that of the individual compounds. Orig. art. has: 4 figures and 1 table.

Card 2/3



L 07696-63
ACCESSION NR: AP3004701

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Phy-
sics, AN SSSR)

SUBMITTED: 25Dec62 DATE ACQ: 28Aug63 ENCL: 00

SUB CODE: CH, MA NO REF SOV: 005 OTHER: 000

Card 3/3

POPOVA, Z.V.; YANOVSKIY, D.M.; KIRPICHNIKOV, P.A.; KAPUSTINA, A.S.; DAVYDOVA, V.M.

Stabilization of polyvinyl chloride by alkylphosphinic esters. Zhur.-prikl.khim. 36 no.1:187-191 Ja '63. (MIRA 16:5)
(Vinyl polymers) (Phosphinic acid)

MUKMENEVA, N.A.; KIRPICHNIKOV, P.A.; PUDOVIK, A.N.

Polyphosphites. Part 6: Interaction of diaryl phosphoryl chlorides with dihydroxy compounds. Zhur.ob.khim. 33 no.10:3192-3196 O '63. (MIRA 16:11)

S/080/63/036/001/018/026
D204/D307

AUTHORS: Popova, Z.V., Yanovskiy, D.M., Kirpichnikov, P.A., Kapustina, A.S., and Davydova, V.M.

TITLE: Stabilization of polyvinyl chloride (PVC) with esters of alkylphosphinic acid

PERIODICAL: Zhurnal prikladnoy khimii, v. 36, no. 1, 1963, 187 - 191

TEXT: The n-butyl, n-amyl, n-hexyl, n-octyl, iso-propyl, iso-amyl, and phenyl esters of 1,2-epoxy-2-propyl-phosphinic acid were prepared by condensing the corresponding dialkyl phosphorus acids with monochloroacetone, at 100°C, without a catalyst, and removing HCl from the resulting esters of 1-hydroxy-2-chloro-iso-propylphosphinic acid with alcoholic 25 - 35 % KOH. The stabilizing effects of these compounds on the thermal decomposition of PVC were investigated by heating PVC, with and without additions of the phosphinates (0-0.5 g per g PVC), to 175, 185, and 195°C. The quantities measured were the induction period until the commencement of HCl evolution (T min), mean integral rate of HCl

Card 1/2

evolution over 3 hours (V mg HCl/g PVC) and the temperature of initial decomposition (toC). The phosphinates exerted a retarding action, which varied according to the nature of R in $(RO)_2P.O.C(CH_3)=CHO$. When R was a straight chain, the stabilizing effect was most strongly pronounced. The reduction in V was greater for (a) higher alkyl groups, (b) higher temperatures and (c) greater concentrations of the phosphinate in the polymer. Phenyl and iso-alkyl phosphinates were less effective but their effects also increased at higher temperatures. The mechanism of the stabilizing action is indicated. There are 2 tables.

SUBMITTED: December 6, 1961

Card 2/2

ANGERT, L.G.; KIRPICHNIKOV, P.A.; KUZ'MINSKIY, A.S.; SARATOV, I.Ye.

Synthesis of mixed esters of α-naphthylphosphorous acid and study of their inhibiting effect in the oxidation of crude and cured rubbers. Zhur. prikl. khim. 36 no.10:2270-2276 O '63. (MIRA 17:1)

LEVIN, P.I.; KIRPICHNIKOV, P.A.; LUKOVNIKOV, A.F.; KHLOPLYANKINA, M.S.

Mutual intensification of the effect of antioxidants (synergism). Part 3: Manifestation of synergism in mixtures of alkylated phenol sulfide with certain phosphorous acid esters. Vysokom.soed. 5 no.8:1152-1155 Ag '63. (MIRA 16:9)

1. Institut khimicheskoy fiziki AN SSSR.
(Antioxidants) (Phenol) (Phosphorous acid)

ZARETSKIY, Ya.S.; RASPOPOVA, L.V.; AVECHKO-ANTONOVICH, L.A.; FRIDLAND, V.M.; KIRPICHNIKOV, P.A.; TAGANTSEV, A.V.

New thiokol sealers for the construction industry. Stroi. mat. 10 no.3:8-9 Mr '64. (MIRA 17:6)

ACCESSION NR: AP4012190 S/0191/64/000/002/0037/0039

AUTHORS: Matveyeva, Ye. N.; Kirpichnikov, P. A.; Kremen', M. Z.; Obol'yaninova, N. A.; Lazareva, N. P.; Popova, L. M.

TITLE: Alkylaryl esters of pyrocatechin phosphorous acid - new stabilizers of polymers

SOURCE: Plasticheskiye massy*, no. 2, 1964, 37-39

TOPIC TAGS: pyrocatechin phosphorous acid, stabilizer, polymer, 4-(α-phenyl ethyl)-2-hydroxy phenyl dibutyl phosphite, 4-(α-phenyl ethyl)-1.2-phenylene phenyl phosphite, heat stabilizer, polyolefin, aging

ABSTRACT: Esters 4-(α-phenyl ethyl)-2-hydroxy phenyl dibutyl phosphite and 4-(α-phenyl ethyl)-1.2-phenylene phenyl phosphite were difficult to extract in pure form and were studied as stabilizers in a technical form. The effectiveness of alkylaryl esters of pyrocatechin phosphorous acid as heat stabilizers of polyolefins (polyethylene of low and high pressure and copolymer of ethylene with propylene) was evaluated as to rate of "aging" of unstabilized and

Card 1/2

ACCESSION NR: AP4012190

stabilized polymers. Many aromatic esters of pyrocatechin phosphorous acid are found to be effective thermostabilizers of high and low pressure polyethylene and the copolymer of ethylene with propylene. Physico-mechanical and dielectric properties of the polyolefins were also studied as a function of the heat-aging process. Orig. art. has: 1 Table

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: CH, MA NR REF SOV: 004 OTHER: 018

Card 2/2

KIRPICHNIKOV, P.A.; KAMAY, Gil'm; KHISAMUTDINOVA, R.Sh.

Synthesis of alkyl- and aryl-β,β'-dichloroisopropyl phosphites.
Zhur.ob.khim. 34 no.2:434-436 F '64. (MIRA 17:3)

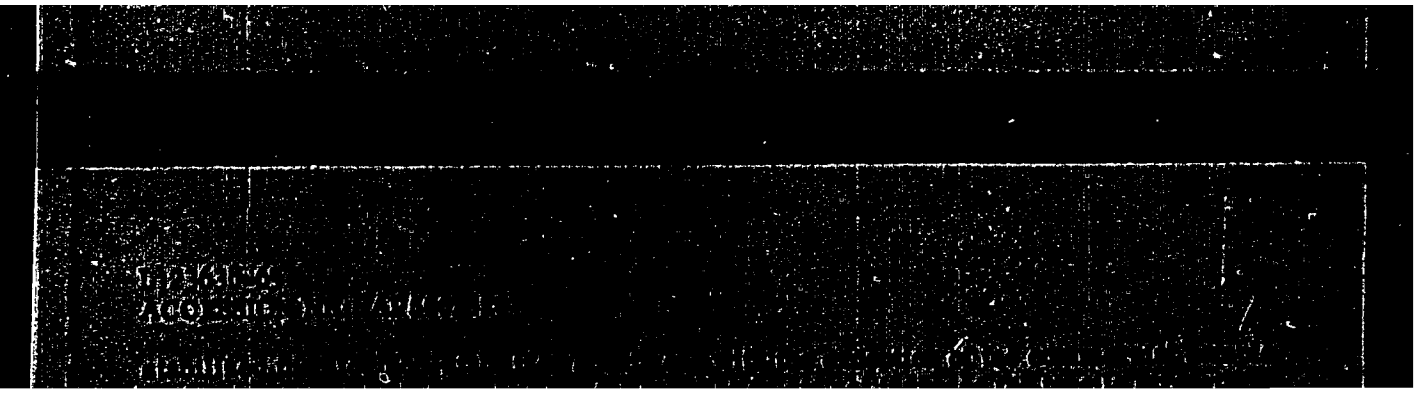
KIRPICHNIKOV, P.A.; GURVICH, Ya. A.; IVANOVA, M.V.

Synthesis of esters of β-naphthylphosphorous acid. Zhur. ob. khim. 34 no. 3:856-857 Mr '64. (MIRA 17:6)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni S.M. Kirova i Dorogomilovskiy khimicheskiy zavod imeni M.V.Frunze.

KIRPICHNIKOV, P.A.; MUKMENEVA, N.A.; PUDOVIK, A.N.; YARTSEVA, L.M.

Interaction of α,α-diphenylpicrylhydrazyl with phosphorous acid esters. Zhur. ob.khim. 34 no. 5:1683-1684 My '64. (MIRA 17:7)



APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000722720001-0"

L 11812-66 EWT(m)/EWP(1)/T RPL WW/JWD/RM

ACC NR: AP6001092 SOURCE CODE: UR/0138/65/000/012/0010/0012

AUTHOR: Ayerko-Antonovich, Yu. O.; Kirpichnikov, P. A.

ORG: Kazan Chemical Engineering Institute im. S. M. Kirov (Kazanskiy khimiko-tekhnologicheskiy institut)

TITLE: Urethane rubbers based on cross-linked polyesters and vulcanizable by sulfur

SOURCE: Kauchuk i rezina, no. 12, 1965, 10-12

TOPIC TAGS: rubber, vulcanization, organic isocyanate compound, sulfur

ABSTRACT: Urethane rubbers vulcanizable by sulfur were obtained in two ways: (1) by using polyesters (linear or partially cross-linked by glycerin) of adipic acid, diethylene glycol, and 1-butene-3,4-dione, and (2) by joint curing of a mixture of saturated linear or cross-linked polyester and 1-butene-3,4-diol by 2,4-toluylene diisocyanate. As the degree of cross-linking of the polyester increases, the amount of diisocyanate necessary for obtaining rubbers with high physicomechanical characteristics decreases. The best properties are displayed by sulfur vulcanizates prepared from polyesters containing 1.0 mole % glycerin. Although an increase in cross-linking (up to 1.5 mole % glycerin) permits an improvement of the properties in some cases, the rubbers obtained are not sufficiently plastic. Orig. art. has: 1 figure and 4 tables.

SUB CODE: 11 / 13 / SUBM DATE: none / ORIG REF: 005 / OTH REF: 008

Card 1/1 fv

UDC: 678.666:546/547.07:678.028:678.043

AVERKO-ANTONOVICH, L.A.; KIRPICHNIKOV, P.A.; ZARETSKIY, Ya.S.; FRIDLAND, V.M.; PROKHOROV, V.S.; RASPOPOVA, L.V.; Prinimala uchastiye: ZUBKOVA, T.P.

Production of colored thiokol sealing materials. Kauch. i rez. 24 no.9:20-23 '65. (MIRA 18:10)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni S.M.Kirova.

KIRPICHNIKOV, P.A.; GURVICH, Ya.A.; GREN, G.P.

Synthesis of alkyl aryl esters of salicylphosphorous acid. Zhur. ob. khim. 35 no.4:744-745 Ap '65. (MIRA 18:5)

1 Kazanskiy khimiko-tekhnologicheskiy institut imeni S.M. Kirova i Dorogomilovskiy khimicheskiy zavod im. M.F. Frunze.

KIRPICHNIKOV, P.A.; POPOVA, L.M.

Synthesis and properties of alkyl aryl esters of pyrocatechol-phosphorous acid. Zhur. ob. khim. 35 no.6:1026-1027 Je '65. (MIRA 18:6)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni Kirova.

L 25622-66 EWT(m)/EWP(j)/T/ETC(m)-6 IJP(c) WW/RM

ACC NR. AP6016064 SOURCE CODE: UR/0020/65/164/005/1050/1053

AUTHOR: Kirpichnikov, P. A.; Mukmeneva, N. A.; Kolyubakina, N. S.; Fudovik, A. N. (Corresponding member AN SSSR) 57 B

ORG: Kazan' Chemicotechnological Institute im. S. M. Kirov (Kazanskiy khimiko-tekhnologicheskiy institut)

TITLE: Interaction of esters of phosphorous acid with 1,1-diphenylethane hydroperoxide

SOURCE: AN SSSR. Doklady, v. 164, no. 5, 1965, 1050-1053

TOPIC TAGS: phosphorous acid, ester, polarographic analysis, reaction rate, polymer

ABSTRACT: A kinetic study was made of the behavior of various aliphatic and aromatic esters of phosphorous acid, mixed esters of pyrocatecholphosphorous acid, and diphosphites in the reaction with 1,1-diphenylethane hydroperoxide, and the influence of the structure of the phosphites used on the rate of the reaction was investigated. Polarographic studies with a dropping mercury electrode revealed that aliphatic phosphites are more active than the aromatic forms. An analogous pattern is observed for esters of pyrocatecholphosphorous acid. The activity series are given for four complete esters of phosphorous acid, five esters of pyrocatecholphosphorous acid, and four diphosphites. The influence of other factors was studied: increasing the concentration of one of the reagents (hydroperoxide:phosphite ratios from 1:10 to 1:1.5) and increasing the temperature (from 20° to 30°) promote an increase in the reaction rate. The patterns of interaction of the hydroperoxide of 1,1-diphenylethane with esters of phosphorous acid were found to be directly dependent upon the inhibiting properties of the latter with respect to thermooxidative destruction of polymers. Orig. art. has: 3 figures and 1 table. [JPRS]

SUB CODE: 07 / SUBM DATE: 09Apr65 / OTH REF: 004 UDC: 547.26'118

Card 1/1

KOVARSKAYA, B.M.; TARNOPOL, P.M.; LEVATOVSKAYA, [illegible]; [illegible], L.P.; KIRPICHNIKOV, P.A.; GURVICH, Ya.A.

Effect of stabilizers on a prolonged thermal oxidative aging of the polyamide "68." Plast. massy no.8:7-8 '65. (MIRA 18:9)

KIRPICHNIKOV, P.A.; MUKMENEVA, N.A.; PUDOVIK, A.N.; KOLYUBAKINA, N.S.

Reaction of phosphorous acid esters with 1,1-diphenylethane hydroperoxide. Dokl. AN SSSR 164 no.5:1050-1053 O '65.
(MIRA 18:10)

1. Kazanskiy khimiko-tekhnologicheskiy institut im. S.M.Kirova.
2. Chlen-korrespondent AN SSSR (for Pudovik).

L 42171-66 EWP(j)/EWT(m) RM

ACC NR: AR6014534 (A) SOURCE CODE: UR/0081/65/000/019/S037/S037

AUTHORS: Kirpichnikov, P. A.; Kadyrova, V. Kh. 26

TITLE: Sulfur-containing polyphosphites and some of their properties B

SOURCE: Ref. zh. Khimiya, Abs. 19S222

REF SOURCE: Tr. Kazansk. khim.-tekhnol. in-ta, vyp. 33, 1964, 193-197

TOPIC TAGS: aromatic phosphorus compound, organic synthetic process, organic sulfur compound

ABSTRACT: Sulfur-containing polyphosphites (SP) are obtained in 90--96% yield by polytransesterification of diphenylphosphite esters $(C_6H_5O)_2POR$ (R--CH_3, C_2H_5, iso-C_3H_7, iso-C_4H_9, iso-C_5H_{11}, C_6H_5, $C_{10}H_7$) with bis-(4-oxyphenyl)-sulfide. The process is accomplished in two steps: first, by heating equimolar amounts of reactants in N_2 atmosphere for 1--1.5 hours at 260--278C, then for 2--2.5 hours at 120-180C/9--12 mm and for 2--3 hours at 170--210C/1 mm. SP are glassy materials, soluble in dioxane, chloroform, and benzene; they are slowly hydrolyzed by water, contain 7--10% of P, and their molecular weight is from 820 to 2200. By heating with S for 10 hours at 160--170C, SP may be converted to corresponding thiopolyphosphates. V. Kireyev [Translation of abstract]

SUB CODE: 07

Card 1/1

L 40960-66 EWT(m)/EWP(j) IJP(c) RM/JWD

ACC NR: AR6019466 (A) SOURCE CODE: UR/0081/66/000/002/S083/S084

AUTHOR: Ayorko-Antonovich, Yu. O.; Kirpichnikov, P. A.

TITLE: Polyurethane elastomers vulcanized with sulfur 45 B

SOURCE: Ref zh. khim, Part II, Abs. 2S639

REF SOURCE: Tr. Kazansk. khim.-tekhnol. in-ta, vyp. 33, 1964, 249-253

TOPIC TAGS: polyurethane, vulcanization, gylcol, sulfur, mechanical property, elastomer

ABSTRACT: SKU elastomers which can be vulcanized with sulfur were prepared using 1-alloxypropanediol-2,3 (I) and 1-butenediol-3,4 (II) as unsaturated gylcols; these were introduced into the initial diol mixture in amounts of 4-5 mol % in the synthesis of linear mixed polyethers. SKU elastomers were obtained by heating polyether and 2,4-toluylene diisocyanate (III) mixtures for 0.75-3.5 hours at 120° with up to 10-25% excess III. Milled mixtures were vulcanized in a press for 60 minutes at 134° and 150-180 kg/cm^2 pressure. Reducing the amount of I to 4 mol % in the diol mixture does not impair physical-mechanical properties of the vulcanizates; the amount of III may be reduced to 10 mol %. In using II, 4 mol % is sufficient for effective sulfur

Card 1/2

L 40960-66

ACC NR: AR6019466 O

vulcanization, but reduction of excess III to less than 15 mol % leads to noticeable impairment of the properties of the rubbers. V. Sidnev. [Translation of abstract].

SUB CODE: 07, 11, 20

Card 2/2 hs

Card 1/1 mf2E UDC: 547.26'118

0925 1002

L 10373-67 EWP(j)/EWT(m) RM

ACC NR: AP7003057 SOURCE CODE: UR/0079/66/036/006/1143/1147

AUTHOR: Kirpichnikov, P. A.; Popova, L. M.; Richmond, G. Ya. 26

ORG: Chemicotechnological Institute (Kazanskiy khimiko-tekhnologicheskiy institut)

TITLE: Synthesis of alkyl(dialkyl)pyrocatecholphosphites

SOURCE: Zhurnal obshchey khimii, v. 36, no. 6, 1966, 1143-1147

TOPIC TAGS: organic synthetic process, organic phosphorus compound

ABSTRACT: A series of alkyl- and dialkylpyrocatecholchlorophosphites, as well as esters of substituted pyrocatecholphosphorous acids, were synthesized and described for the first time. The esters of alkylpyrocatecholphosphorous acid were produced by reaction of alkylpyrocatecholmonochlorophosphite with various alcohols and phenols. The starting materials were synthesized by alkylation of monohydric phenols; optimum conditions, ensuring high yields of 3,5-ditert-butyl- and 3,5-diter-amylpyrocatechol were found. Orig. art. has: 4 tables. [JPRS]

SUB CODE: 07 / SUBM DATE: 20May65 / ORIG REF: 008 / OTH REF: 004

Card 1/1 JB UDC: 547.26'118

L 10396-67 EWT(m)/EWP(j) IJP(c) RM

ACC NR: AP7003119 SOURCE CODE: UR/0080/66/039/007/1572/1576

46

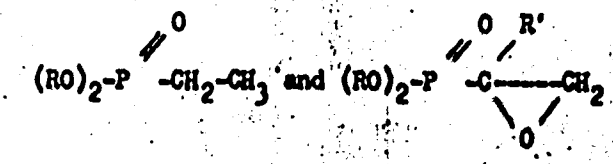
BOGATYREVA, T. K., KAPUSTINA, A. S., KIRPICHNIKOV, P. A., TIKHOVA, Y. V., and YANOVSKIY, D. M.

ORG: none

"Stabilization of Polyvinylchloride by Esters of 1,2-Epoxy-1-phenylethylphosphinic and 1,2-Epoxypropylphosphinic Acids. Report 2"

Moscow, Zhurnal Prikladnoy Khimii, Vol 39, No 7, Jul 66, pp 1572-1576

Abstract: The esters of 1,2-epoxy-2-propylphosphinic acid are known to inhibit the thermal decomposition of polyvinylchloride (PVC). The effect of esters of phosphinic acid with the following general formula on the thermal decomposition of PVC was studied to further investigate the stabilizing action of organophosphorus compounds:



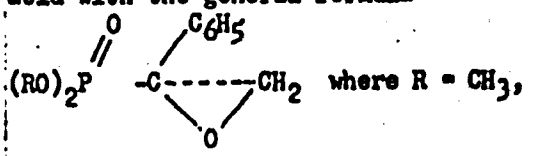
where R = alkyl group, R' = CH_3 or C_6H_5.

Card 1/2

L 10396-67

ACC NR: AP7003119

The previously undescribed esters of 1,2-epoxy-1-phenylethylphosphinic acid with the general formula



where R = CH_3, C_2H_5, iso-C_3H_7, iso-C_4H_9, or iso-C_5H_{11},

were obtained by the dehydrochlorination of the esters of alpha-hydroxy-alpha-phenyl-beta-chloroethylphosphinic acid.

The stabilizing effect of the esters studied during the thermal decomposition of PVC depends on their structure and on the experimental conditions.

The nature of the esters of 1,2-epoxy-1-phenylphosphinic and 1,2-epoxy-2-propylphosphinic acids in the stabilizing action on the thermal decomposition of PVC was established.

It was shown that the action of the esters is determined by the strength of the carbon-phosphorus bond, and the effect on the stability of the ester molecule depends on the nature of the radical connected to the carbon epoxy ring.

Orig. art. has: 1 figure and 2 tables. [JPRS: 38,970]

TOPIC TAGS: polyvinyl chloride, ester, phosphinic acid, thermal decomposition

SUB CODE: 07 / SUBM DATE: 09Jun64 / ORIG REF: 003 / OTH REF: 001

Card 2/2 bm

L 42050-66 EWT(m)/EWP(j) RM

ACC NR: AP6011232 (A) SOURCE CODE: UR/0413/66/000/006/0074/0074

INVENTOR: Gurvich, Ya. A.; Kirpichnikov, P. A.; Zimin, Yu. B.; Kovarskaya, B. M.; Levantovskaya, I. I.

ORG: none

18
B

TITLE: Method of stabilizing polyamides.[15] Class 39, No. 179918[15]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 6, 1966, 74

TOPIC TAGS: polyamide, chemical stabilizer, fertilizer

ABSTRACT: An Author Certificate has been issued for a method of stabilizing polyamides by introducing organophosphorus stabilizers into them. N-alkylated anilides of arylphosphorous acids are used to expand the variety of organophosphorus stabilizers. [Translation] [NT]

SUB CODE: SUBM DATE: 11Jun64/

Card 1/1 af UDC: 678.675.048:547.55.41

L 43897-66 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6015659 (A) SOURCE CODE: UR/0413/66/000/009/0073/0073

INVENTOR: Tokareva, L. G.; Zhandareva, Z. A.; Mikhaylov, N. V.; Kirpichnikov, P. A.

37
B

ORG: none

TITLE: Method of making vinyl polymers heat resistant. Class 39, No. 181278 [announced by the All-Union Scientific Research Institute of Synthetic Fibers (Vsesoyuznyy nauchno-issledovatel' skiy institut iskustvennogo volokna)

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 9, 1966, 73

TOPIC TAGS: vinyl polymer, polyvinyl alcohol, heat resistance, heat resistant polymer

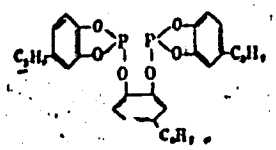
ABSTRACT: An Author Certificate has been issued for a method of making vinyl polymers, such as polyvinyl alcohol and its byproducts, heat resistant by use of phosphorus containing compounds. To increase the number of heat stabilizers and to improve the properties of polyvinyl alcohol and its byproducts, water-insoluble disphosphites of the following formula are used as phosphorus-containing compounds:

Card 1/2 UDC: 678.744.72:678.048

L 43897-66

ACC NR: AP6015659

O



[Translation] [NT]

SUB CODE: 11/ SUBM DATE: 30Jun64/

Card 2/2

PASNIK, I.V.; CHUMAKOV, N.S.; KIRPICHNIKOV, P.A.

Some ways for improving the quality of insole paperboard.
Kozh. obuv. prom. 5 no.7:37-38 Jl '63. (MIRA 16:8)

(Paperboard)
(Shoe industry--Equipment and supplies)

KIRPICHNIKOV, P.A.; CHUMAKOV, N.S.; BOGOMOLOV, B.D.; MOSKVA, V.V.

Certain methods for improving the technological properties of artificial leather. Trudy KKHTI no.26:23-31 '59. (MIRA 15:5)
(Leather, Artificial)

KIRPICHNIKOV, P.I.

Keep pace with life in training specialist workers. Mashinostroitel' no.10:38-39 O '61. (MIRA 14:9)

1. Nachal'nik Glavnogo upravleniye professional'no-tekhnicheskogo obrazovaniya pri Sovete Ministrov RSFSR.
(Professional education)

25497
S/043/61/000/002/007/009
D207/D306

16.3300

AUTHOR: Kirpichnikov, S.N.

TITLE: On the stationary state of the field of impulses

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya matematiki, mekhaniki i astronomii, no. 2, 1961, 117 - 122

TEXT: In the present work, the problem of the existence of a stationary field of impulses for mechanical systems is considered. The general solution of canonical equations, is transformed into a form containing a field of impulses and the conditions for a stationary field are shown to be

$$p_l - \sum_{\mu,\nu=1}^{n} \frac{\partial p_l}{\partial \alpha_\mu} \cdot \frac{\partial \alpha_\mu}{\partial q_\nu} \cdot q_\nu = 0 \quad (l = 1, 2, \ldots, n), \qquad (3.2)$$

where $q_1 \ldots q_n$ are generalized coordinates; $p_1 \ldots p_n$ are generalized impulses; $\alpha_1 \ldots \alpha_n$ are arbitrary constants for which

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On the stationary state ...

$$\frac{D(q_1 \ldots, q_n)}{D(\alpha_1 \ldots, \alpha_n)} \neq 0 \qquad (3.1)$$

and where $\frac{\partial \alpha_\mu}{\partial q_\nu}$ are the elements of the matrix $\left\| \frac{\partial q_\mu}{\partial \alpha_\nu} \right\|^{-1}$. Functions transforming arbitrary constants α_k and β_k into new constants a_ν and b_ν are then given and the condition for the field to be stationary in new constants are shown to be

$$\dot{p}_l - \sum_{k, p, \nu=1}^{n} \left(\frac{\partial p_l}{\partial \alpha_k} \cdot \frac{\partial \alpha_k}{\partial a_p} + \frac{\partial p_l}{\partial \beta_k} \cdot \frac{\partial \beta_k}{\partial a_p} \right) \cdot \frac{\partial a_p}{\partial q_\nu} \cdot \dot{q}_\nu = 0 \quad (l = 1, 2, \ldots, n), \qquad (4.3)$$

where $\frac{\partial a_\mu}{\partial q}$ are the elements of the matrix $\left\| \frac{\partial \bar{q}_\mu}{\partial a_\nu} \right\|^{-1}$. Two existence theorems and their proofs follow. They are: Theorem 1: The necessary and sufficient condition for a system of differential equations

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On the stationary state ...

$$\left.\begin{aligned}\frac{dq_\nu}{dt} &= f_{1\nu}(q_i, p_i, t),\\ \frac{dp_\nu}{dt} &= f_{2\nu}(q_i, p_i, t)\end{aligned}\right\} \quad (i, \nu = 1, 2, \ldots, n). \qquad (1.4)$$

to permit the existence of a stationary field of impulses is, that it should be reducible to

$$\frac{dq_\nu}{dt} = f_{1\nu}(q_i, p_i, t), \quad \frac{dp_\nu}{dt} = \sum_\mu M_{\nu\mu} \cdot f_{1\mu}(q_i, p_i, t) \qquad (2.4)$$

where $M_{\nu\mu} = M_{\nu\mu}(q_i, p_i)$ and a system

$$dp_\nu = \sum_\mu M_{\nu\mu} \cdot dq \qquad (3.4)$$

is integrable. Theorem 2: A sufficient cond tion for Eq. (1.4) to

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D207/D306

On the stationary state ...

permit the stationary field of impulses is that the functions

$$\frac{f_{1\nu}}{f_{1k}}, \frac{f_{2\nu}}{f_{1k}} \quad (\nu = 1, 2, \ldots, k-1, k+1, \ldots, n, \; k - \text{some of } 1, 2, \ldots, n)$$

be time independent and that the conditions of the existence and uniqueness theorems for the system of equations

$$\left.\begin{aligned} \frac{dq_k}{dt} &= f_{1k}(q_l, p_l, t), \\ \frac{dq_\nu}{dq_k} &= \frac{f_{1\nu}}{f_{1k}} \quad (\nu = 1, 2, \ldots, k-1, k+1, \ldots, n), \\ \frac{dp_\mu}{dq_k} &= \frac{f_{2\mu}}{f_{1k}} \quad (\mu = 1, 2, \ldots, n) \end{aligned}\right\} \qquad (8.4')$$

be fulfilled. There are 2 Soviet-bloc references.

Card 4/4

KIRPICHNIKOV, S.N.

Potential method for integrating mechanical equations [with summary in English]. Vest. LGU no.13:103-110 '61. (MIRA 14:7)
(Differential equations) (Mechanics, Analytic)

89329

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3.2400

S/033/61/038/001/012/019
E032/E314

AUTHORS: Brumberg, V.A., Kirpichnikov, S.N. and Chebotarev, G.A.

TITLE: On the Motion of Artificial Moon Satellites

PERIODICAL: Astronomicheskiy zhurnal, 1961, Vol. 38, No. 1, pp. 131 - 144

TEXT: The launching of artificial Moon satellites is a problem for the immediate future. It is known that a number of attempts have been made in the United States to put a satellite into orbit round the Moon, although all of them are said to have been entirely unsuccessful. The theory of motion of artificial Moon satellites has been widely discussed in Western literature (Buchheim - Ref. 1, Kooy - Ref. 2, Kooy and Berghuis - Ref. 3, Grübner and Cap - Ref. 4 and Thüring - Ref. 5); in Soviet literature the theory of motion of these satellites was considered by Yegorov (Ref. 6) and Aksenov and Demin (Ref. 7). Prolonged observations of artificial Moon satellites may be of great interest from the point of view of celestial mechanics, since they can be used

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On the Motion of Artificial Moon Satellites

to improve the present data on the figure and mass of the Moon. The aim of the present paper is to investigate the motion of Moon satellites by considering a number of special cases, the solutions being obtained by numerical integrations. From the mathematical point of view the problem is reduced to the integration of equations of motion of a mass point having a negligible mass, moving in the gravitational field of the Moon and subject to perturbations due to the non-spherical Moon and the gravitational attraction of the Earth and the Sun. The motion of the artificial Moon satellite is described in terms of the mean anomaly M, the area vector $\bar{c}$ and the Laplace vector $\bar{f}$ which are defined by:

$$\bar{c} = \bar{r} \times \dot{\bar{r}} \qquad (5)$$

On the Motion of Artificial Moon Satellites

and:

$$\bar{f} = \bar{r}\dot{\bar{r}}^2 - \dot{\bar{r}}(\bar{r}\dot{\bar{r}}) - \frac{m_0\bar{r}}{\dot{r}} \qquad (6),$$

where $\bar{r}$ is the lunocentric radius vector of the satellite. The Moon is assumed to have the form of a uniformly rotating homogeneous triaxial ellipsoid and the perturbation is represented in the form:

$$\bar{F} = \sum_{i=1}^{3} \frac{m_i}{r_i^3}[\bar{r}_i\varphi_i - \bar{r}(1+\varphi_i)] + \operatorname{grad} V, \qquad (22)$$

The principal set of coordinates xyz is chosen to be the lunocentric system oriented along the principal axes of the ellipsoid of inertia of the Moon for the epoch 1960.0. In

On the Motion of Artificial Moon Satellites

the derivation of the transformation formulae for this system of coordinates it is assumed that the Moon moves in accordance with the Cassini laws. The physical libration of the Moon is neglected. The initial instant of time is chosen to be t_o = 1960, October 24.0. At this instant the Moon is in the neighbourhood of the perigee and is in the first quarter, which may facilitate the observation of the satellite from the Earth. The unit of time is one day and the unit of length is 10 mean radii of the Moon. The other initial data assumed are:

$$\left.\begin{aligned} \frac{m_2}{m_0 + m_1} &= 329\,390, \\ \frac{m_1}{m_0} &= 81.375, \\ N &= \frac{2\pi}{27^d.321\,6609}, \\ p &= 0.272\,274\ \rho_\odot, \\ \rho_\odot &= 6378.270\ \text{km}. \end{aligned}\right\} \quad (38)$$

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E032/E314

On the Motion of Artificial Moon Satellites

where is the mean equatorial radius of the Earth,

is the radius of the Moon,

m_0, m_1 and m_2 are the masses of the Moon, the Earth and the Sun, respectively (multiplied by the gravitational constant) and

N is the average angular velocity of the Moon around its axis.

The initial positions and velocities of the Earth and the Sun in the principal system of coordinates xyz have the following values:

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On the Motion of Artificial Moon Satellites

$$\left.\begin{aligned} x_1 &= +0.128\,077\,44\cdot 10^{2},\\ y_1 &= -0.167\,612\,08\cdot 10^{2},\\ z_1 &= -0.245\,209\,82\cdot 10^{1},\\ x_2 &= 0.128\,601\,29\cdot 10^{4},\\ y_2 &= 0.844\,314\,33\cdot 10^{4},\\ z_2 &= 0.118\,582\,14\cdot 10^{3},\\ \dot{x}_1 &= 0.418\,764\,47\cdot 10^{1},\\ \dot{y}_1 &= 0.325\,042\,31\cdot 10^{1},\\ \dot{z}_1 &= -0.839\,719\,12\cdot 10^{-2},\\ \dot{x}_2 &= -0.143\,319\,51\cdot 10^{2},\\ \dot{y}_2 &= 0.229\,757\,57\cdot 10^{1},\\ \dot{z}_2 &= 0.334\,423\,30\cdot 10^{1}. \end{aligned}\right\} \quad (41)$$

The initial distribution of the Moon, the Earth and the Sun at the initial instant of time is as shown in Fig. 2.
The following four orbits of the satellite are then computed:
1) polar orbit with small eccentricity (Cp) ;
2) equatorial orbit with small eccentricity (Ce) ;

On the Motion of Artificial Moon Satellites

3) polar orbit with large eccentricity (Ep);
4) equatorial orbit with large eccentricity (Ee).
For polar orbits (Cp, Ep) at t_o it was assumed that:

$$i = 90^\circ, \quad \omega = 0^\circ, \quad \Omega = 171^\circ 340 \qquad (42).$$

The quantity Ω was found from the condition that the line of nodes for the satellite orbit is perpendicular to the direction of the Sun. For the equatorial orbits (Ce, Ee) it was assumed that:

$$i = 0^\circ, \quad \Omega + \omega = 171^\circ 340 \qquad (43).$$

Table 1 gives the summary of the initial data (key to Table 1:- 1 - element; 2 - type of orbit.)

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Table 1: Таблица 1

Сводка начальных данных

Элемент Element	Тип орбиты Type of orbit			
	Cp	Ce	Ep	Ee
c_x	0.15528276·10⁸	0	0.18506427·10₀	0
c_y	0.10194870·10¹	0	0.12150144·10¹	0
c_z	0	0.10312480·10¹	0	0.12290275·10¹
l_x	−0.12010540·10¹	−0.12010540·10¹	−0.46025243·10¹	−0.46025243·10¹
l_y	0.19207686·10⁸	0.19207686·10⁸	0.71473935·10⁸	0.71473935·10⁸
l_z	0	0	0	0
M	0	0	0	0

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On the Motion of Artificial Moon Satellites

In the above table, M is the mean anomaly of the satellite. The initial values of the elements were found for orbits with low eccentricity from the condition:

$$h_p = 500 \text{ km}, \quad h_a = 1\,500 \text{ km} \tag{44}$$

so that:

$$a = 0.157\,582\,56, \quad e = 0.182\,705\,98 \tag{45}.$$

For orbits with large eccentricity the corresponding values were:

$$h_p = 500 \text{ km}, \quad h_a = 10\,000 \text{ km} \tag{46}$$

and:

$$a = 0.402\,30841, \quad e = 0.679\,869\,28 \tag{47}.$$

The quantities h_p and h_a denote the height of the pericentre

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E032/E314

On the Motion of Artificial Moon Satellites

and the apocentre at the initial instant of time. Finally, the mean anomaly M was chosen to be zero, i.e. at t_o the satellite was at the pericentre of its orbit. The integration of the equations of motion was carried out by the Runge-Kutta method. 19 equations of the first order and one time equation were integrated. Table 3 gives the initial and final elements of the orbits (key to Table 3: Title - Change in Orbit Elements of the Satellite; 1 - type of orbit; 2 - number of revolutions; 3 - a (in lunar radii); 4 - T (in days); 5 - Cp; 6 - Ce; 7 - Ep; 8 - Ee.)
Fig. 3 gives the variation of the eccentricity with number of complete revolutions. Fig. 4 gives a similar plot for the quantity cos i and Fig. 5 gives the variation in the distance of the pericentre (in lunar radii).
Complete numerical data on the basis of which these graphs were plotted are reproduced. The authors intend to continue their work in this field.

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On the Motion of Artificial Moon Satellites

There are 5 figures, 7 tables and 8 references: 3 Soviet and 5 non-Soviet.

ASSOCIATION: Institut teoreticheskoy astronomii Akademii nauk SSSR (Institute of Theoretical Astronomy of the Academy of Sciences, USSR)

SUBMITTED: October 22, 1960

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Table 3:

Изменение элементов орбит спутников Луны

(1) Тип орбиты	(2) Количество оборотов	(3) a (в радиусах Луны)	e	i	ω	Ω	M	(4) T (в сутках)
(5) Полярная орбита с малым эксцентриситетом	0	1.5758	0.18271	90°.000	0°.000	171°.340	0°.000	0.1487
	40	1.5752	0.18175	90°.040	0°.888	171°.354	45°.754	0.1487
(6) Экваториальная орбита с малым эксцентриситетом	0	1.5758	0.18271	0°.000	—	—	0°.000	0.1487
	40	1.5759	0.17325	0°.060	14°.309	160°.042	0°.010	0.1488
(7) Полярная орбита с большим эксцентриситетом	0	4.0231	0.67087	90°.000	0°.000	171°.340	0°.000	0.6068
	40	4.0247	0.68036	88°.104	8°.414	171°.057	17°.695	0.6072
(8) Экваториальная орбита с большим эксцентриситетом	0	4.0231	0.67987	0°.000	—	—	0°.000	0.6068
	40	4.0205	0.65035	1°.539	17°.953	160°.031	12°.370	0.6076

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E032/E314

On the Motion of Artificial Moon Satellites

Fig. 2:

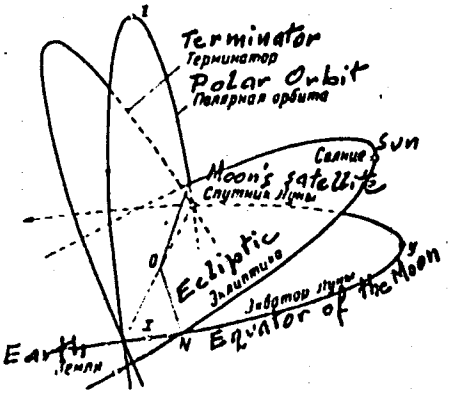

Рис. 2. Взаимное расположение Земли, Солнца и спутника Луны в начальный момент

Fig. 3:

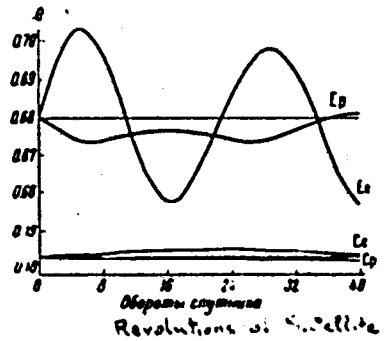

Рис. 3. Изменение эксцент ри... для орбит *Cp*, *Ce*, *Ep*, ...

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E032/E314

On the Motion of Artificial Moon Satellites

Fig. 4:

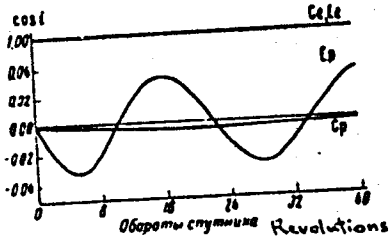

Рис. 4. Изменение косинуса наклонности для орбит *Cp*, *Ce*, *Ep*, *Ee*

Fig. 5:

Рис. 5. Изменение расстояния перицентра (в радиусах Луны) для орбит *Cp*, *Ce*, *Ep*, *Ee*

Card 14/14

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A001/A101

24 4160

AUTHORS: Chebotarev, G. A., Kirpichnikov, S. N.

TITLE: The effect of the shape of the Moon on the motion of lunar artificial satellites

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 11, 1962, 14, abstract 11A105 ("Byul. In-ta teor. astron. AN SSSR", 1962, v. 8, no. 5, 324 - 334, English summary)

TEXT: The authors integrated numerically the motion equations of a lunar satellite for various initial conditions on assumptions that the Moon is a triaxial ellipsoid and it rotates uniformly around its axis. Perturbations due to the Earth and Sun are neglected. The results of numerical integration are presented in tables. There are 11 references.

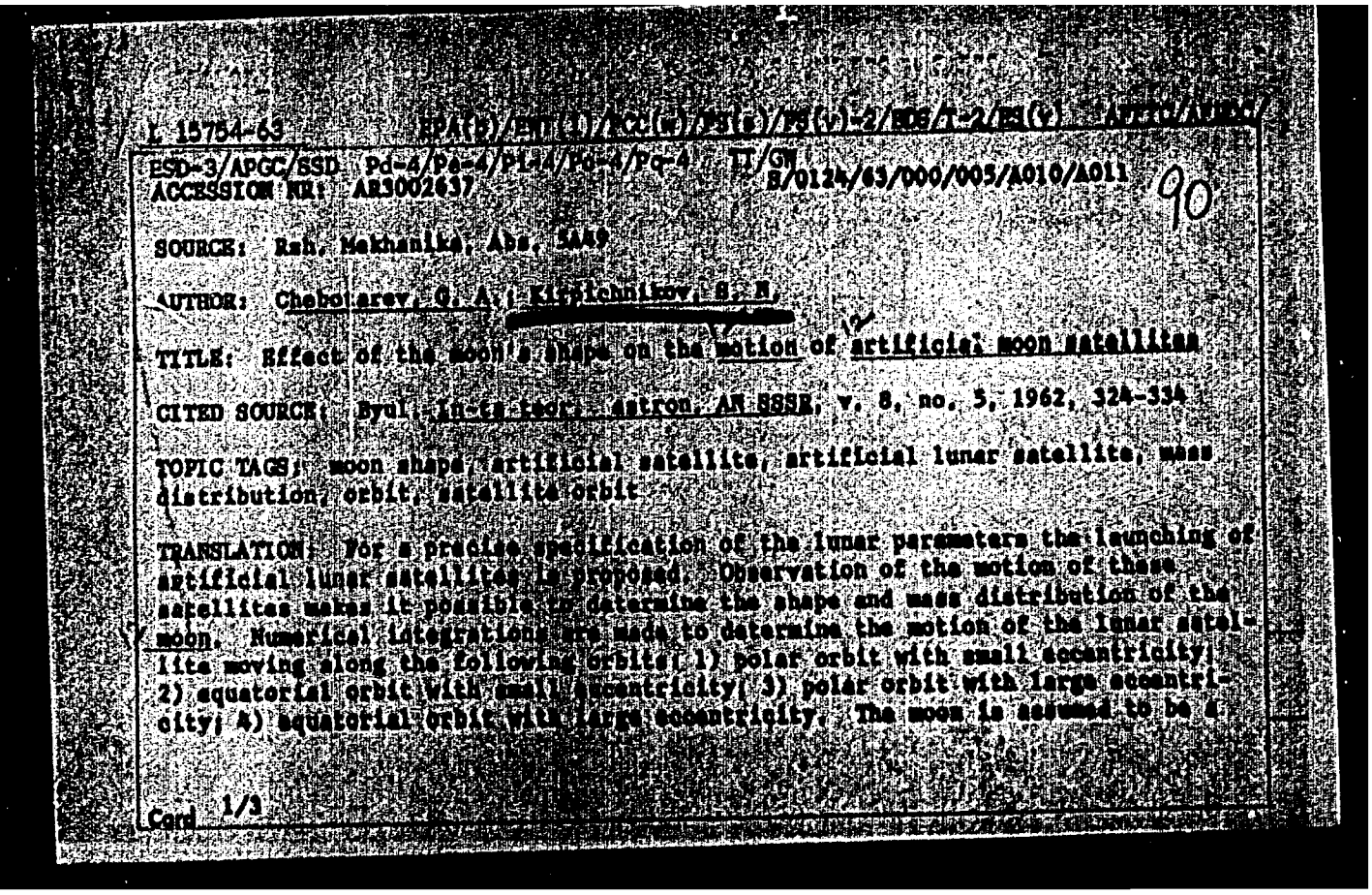
Yu. B.

[Abstracter's note: Complete translation]

Card 1/1

CHEBOTAREV, G.A.; KIRPICHNIKOV, S.N.

Stability of the motion of artificial lunar satellites. Biul.-
Inst.teor.astron. 8 no.6:402-404 '62. (MIRA 15:8)
(Lunar probes)



L 15754-63 EPA(b)/EWT(d)/FCC(w)/FS(s)/FS(v)-2/ESD/T-2/ES(v) AFFTC/ASD/
ESD-3/APGC/SSD Pd-4/Pe-4/Pi-4/Pk-4/Pq-4 IJ/GW
ACCESSION NR: AR3002637 S/0124/63/000/005/A010/A011 90

SOURCE: Rzh. Mekhanika, Abs. 5A49

AUTHOR: Chebotarev, G. A.; Kirpichnikov, S. N.

TITLE: Effect of the moon's shape on the motion of artificial moon satellites

CITED SOURCE: Byul. In-t teor. astron. AN SSSR, v. 8, no. 5, 1962, 324-334

TOPIC TAGS: moon shape, artificial satellite, artificial lunar satellite, mass distribution, orbit, satellite orbit

TRANSLATION: For a precise specification of the lunar parameters the launching of artificial lunar satellites is proposed. Observation of the motion of these satellites makes it possible to determine the shape and mass distribution of the moon. Numerical integrations are made to determine the motion of the lunar satellite moving along the following orbits: 1) polar orbit with small eccentricity; 2) equatorial orbit with small eccentricity; 3) polar orbit with large eccentricity; 4) equatorial orbit with large eccentricity. The moon is assumed to be a

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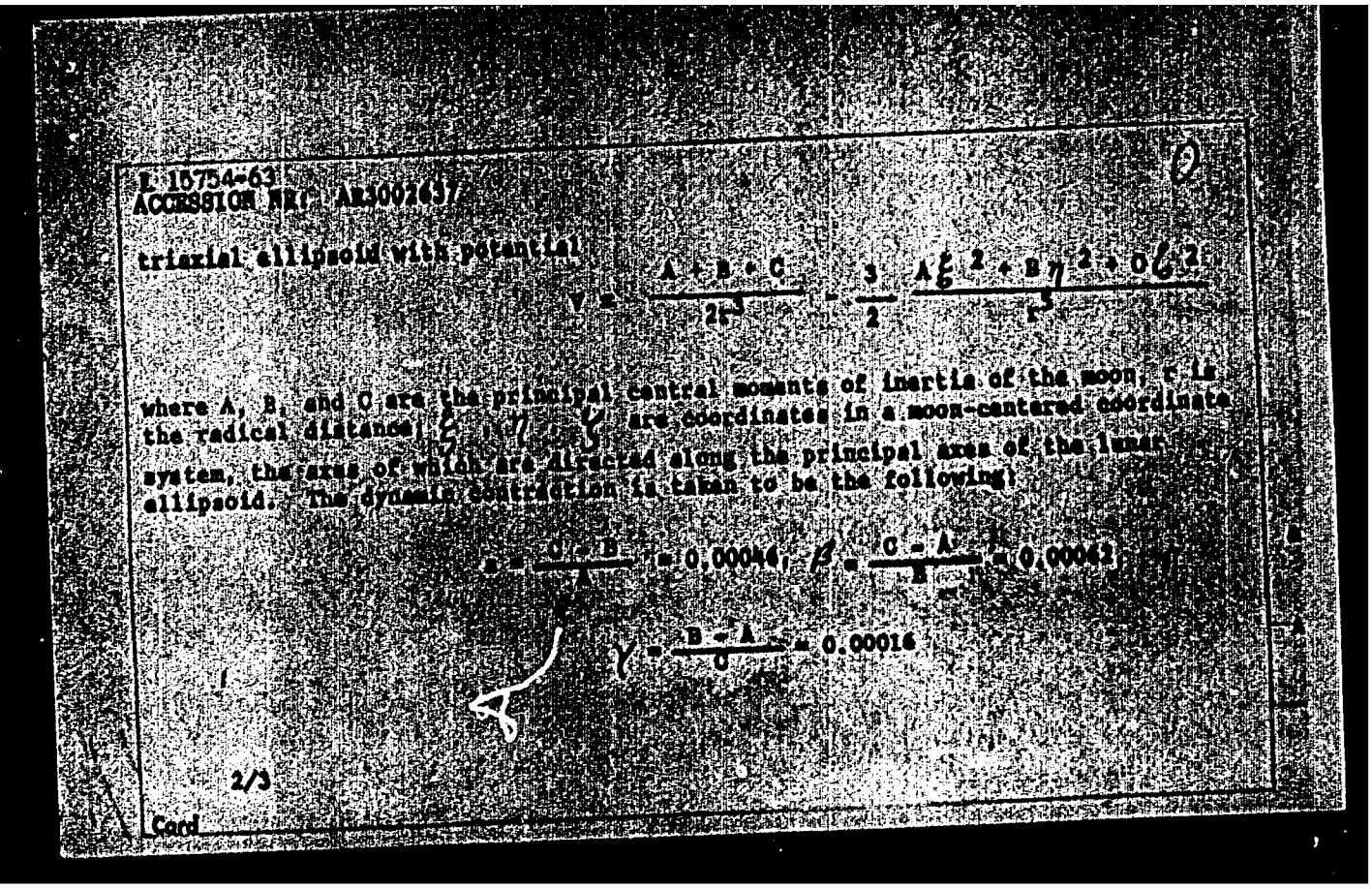

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ACCESSION NR: AR3002637

triaxial ellipsoid with potential

$$V = \frac{A + B + C}{2r^3} - \frac{3}{2} \cdot \frac{A\xi^2 + B\eta^2 + C\zeta^2}{r^5}$$

where A, B, and C are the principal central moments of inertia of the moon; r is the radical distance; ξ, η, ζ are coordinates in a moon-centered coordinate system, the axes of which are directed along the principal axes of the lunar ellipsoid. The dynamic contraction is taken to be the following:

$$\alpha = \frac{C - B}{A} = 0.00046; \quad \beta = \frac{C - A}{B} = 0.00042;$$

$$\gamma = \frac{B - A}{C} = 0.00016$$

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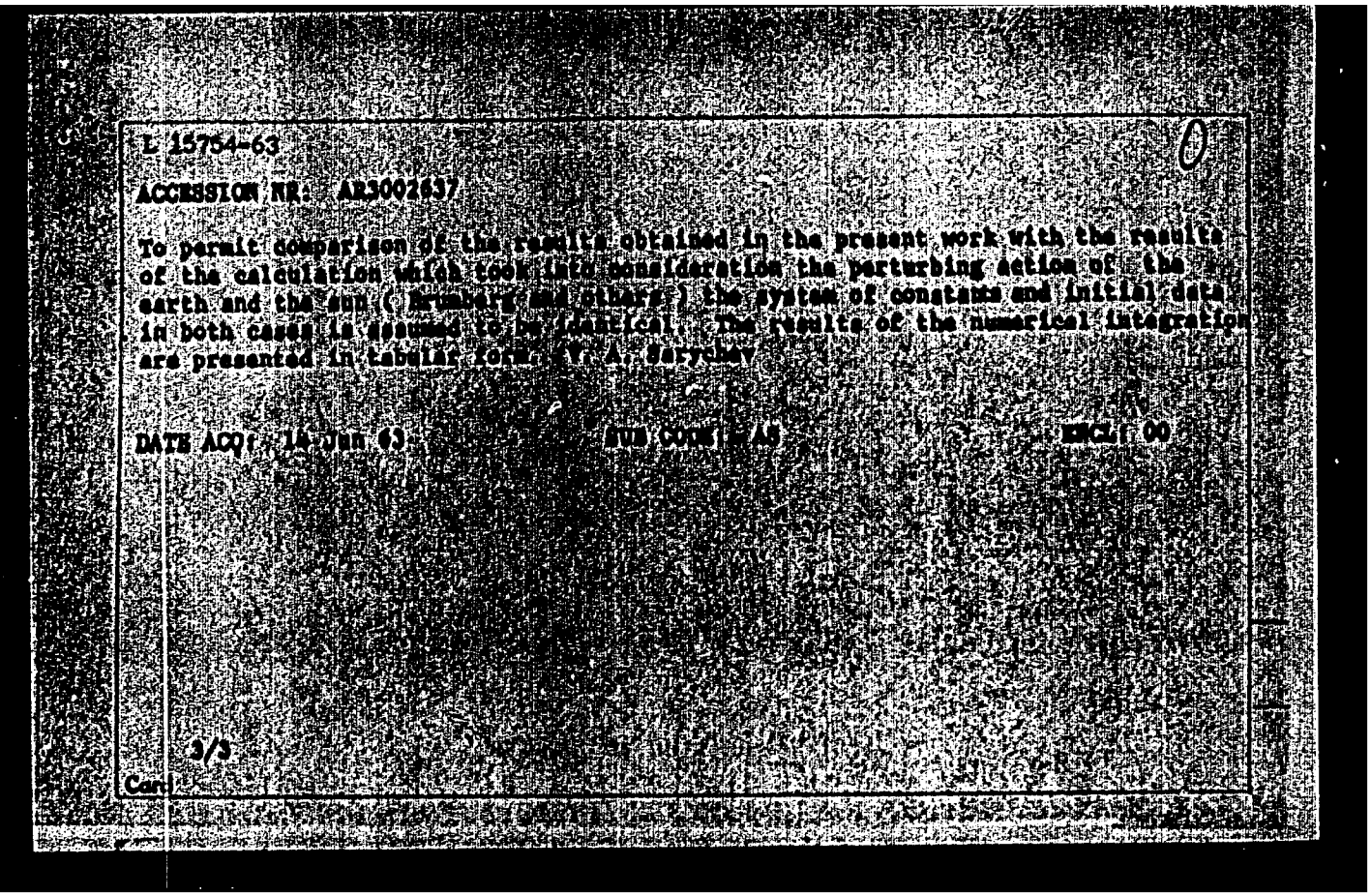
Card



L 15754-63

ACCESSION NR: AR3002637

To permit comparison of the results obtained in the present work with the results of the calculation which took into consideration the perturbing action of the earth and the sun (Brumberg and others) the system of constants and initial data in both cases is assumed to be identical. The results of the numerical integration are presented in tabular form. V. A. Zaryshev

DATE ACQ: 14 Jun 63 SUB CODE: AS ENCL: 00

3/3

Card

KIRICHNIKOV, S. N.

Optimum coplanar interorbital flight with allowance for the internal mass supply proportional to the time of flight. Vest. LGU 19 no.7:116-129 '64. (MIRA 17:7)

CHEBOTAREV, G.A.; KIRPICHNIKOV, S.N

Study on the motion of artificial moon satellites. Biul. Inst. teor. astron. 10 no.2:109-117 '65. (MIRA 18:7)

KIRPICHNIKOV, S.N.

Approximating technique for solving extremum problems. Vest. LGU 20 no.19:143-146 '65. (MIRA 18:10)

L 7065-66 EWT(d) LWP(d)
ACC NR: AP5027362 SOURCE CODE: UR/0043/65/000/004/0143/0146

AUTHOR: Kirpichnikov, S. N.

ORG: none

TITLE: Approximate method for solving extremal problems

SOURCE: Leningrad. Universitet. Vestik. Seriya matematiki, mekhaniki i astronomii, no. 4, 1965, 143-146

TOPIC TAGS: optimality, maxima, minima, extremal problem

ABSTRACT: The author treats the problem of finding the minimum of

$$g = g(x_1, x_2, \ldots, x_n, \varepsilon), \quad (1)$$

subject to

$$\varphi_j(x_1, x_2, \ldots, x_n, \varepsilon) = 0, \; j = 1, 2, \ldots, p, \; p < n, \quad (2)$$

He uses the method of small parameters, seeking the solution of (2) and

$$\frac{\partial g}{\partial x_i} + \sum_{j=1}^{p} \lambda_j \frac{\partial \varphi_j}{\partial x_i} = 0, \quad i = 1, 2, \ldots, n, \quad (3)$$

Card 1/2 UDC: 521.1.01:531.55

L 7065-66
ACC NR: AP5027362

in the form of a series in powers of ε. He proves two theorems, one concerning obtaining the principal parts of the coefficients in the series in powers of ε, and the other concerning the order of magnitude of the error in the estimate of the minimizing function. He treats as an example the coplanar problem of construction of the orbit of an optimal single-thrust flight between bounding orbits of small eccentricity in a central force field. Orig. art. has: 12 formulas.

SUB CODE: MA/ SUBM DATE: 21Sep64/ ORIG REF: 001/ OTH REF: 001

Card 2/2

KIRPICHNIKOV, S.N.

Minimum-time interorbital trajectories at given values of mass expenditure. Biul. Inst. teor. astron. 10 no.1:27-43 '65.
(MIRA 18:12)

1. Submitted May 3, 1963.

L 46741-66 EWT(1)/EWP(m) GW

ACC NR: AR6014276 SOURCE CODE: UR/0313/65/000/011/0025/0025

32
B

AUTHOR: Kirpichnikov, S. N.

TITLE: Interorbital trajectories minimal in time for given magnitudes of mass consumption

SOURCE: Ref. zh. Issledovaniye kosmicheskogo prostranstva, Abs. 11.62.212

REF SOURCE: Byul. In-ta teor. astron. AN SSSR, v. 10, no. 1. 1965, 27-43

TOPIC TAGS: orbit transfer, orbit calculation, orbit flight path

ABSTRACT: The problems of constructing the orbit of a double-impulse flight between fixed orbits for a given magnitude of mass consumption of both impulses and the problem of determining single-impulse flights between orbits are considered. In both cases the travel time is minimized. It is assumed that all the orbits are located in a single plane and are Keplerian with the motion in one direction. Specific motions in all the orbits are taken into account. The methods for solving the posed problems are given in the case of limiting circular orbits and limiting orbits of small eccentricities. N. Ya. [Translation of abstract]

SUB CODE: 22

Card 1/1 alm

L 45311-66 FSS-2/EWT(l)/EWP(m) TT/GW

ACC NR: AR6016280 SOURCE CODE: UR/0269/66/000/001/0014/0014

54
B

AUTHORS: Chebotarev, G. A.; Kirpichnikov, S. N.

TITLE: A study of the motion of artificial moon satellites

SOURCE: Ref. zh. Astronomiya, Abs. 1.51.102

REF SOURCE: Byul. In-ta teor. astron. AN SSSR, v. 10, no. 2, 1965, 109-117

TOPIC TAGS: lunar satellite, satellite orbit

ABSTRACT: The authors review twenty different variants of orbits for fictitious moon satellites. The coordinates and velocities of the earth, moon, and sun at the moment t_0 = 1960 October 24.0 were taken as initial data in all variants. The earth and sun were viewed as material points, while a uniformly rotating homogeneous tri-axial ellipsoid was taken as the figure of the moon. The integration of differential equations of motion was carried out according to the Runge-Kutta method with an automatic selection of the length of the step on a BESM-2 electronic computer. The results of the numerical integrations were tabulated. The authors claim that the motion of near equatorial moon satellites with direct movement is stable even in the case of orbits with great eccentricities. Instability arises with a magnitude of a large semiaxis equal to approximately 15 lunar radii. It is established that polar satellites have an unstable motion, so that after a small number of revolu-

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tions they fall to the lunar surface or go into a hyperbolic orbit. Equatorial satellites with a retrograde motion are the most stable. Instability arises only with a magnitude of a large semiaxis equal to approximately 25 lunar radii, the radius of the sphere of influence of the moon being equal to 38 lunar radii. R. Yeremenko [Translation of abstract]

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KIRPICHNIKOV, U.S.

25160 Kirpichnikov, U.S. Amurskiy Sazan Na Severe Sssr. Ryb. Khoz-Vo, 1949, No. 8 s. 39-44

SO: Letopis' No. 33, 1949

MASTER, Abram Zinov'yevich; VAL'SHTEYN, O., redaktor; KIRPICHNIKOV, V., redaktor; OYSTRAKH, V., tekhnicheskiy redaktor

[High labor productivity in mines on a 24-hour schedule] Vysokaia proizvoditel'nost' truda na shakhte sploshnoi tsiklichnosti. Alma-Ata, Kazakhskoe gos. izd-vo 1956. 39 p. (MLRA 9:10)
(Coal mines and mining)

KIRPICHNIKOV, V.

"Principle Genes for scales in scarp." (p. 601) Section of Genetics and Selection, Institute of Pond Fish Culture, Moscow. by Kirpichnikov, V.

SO: Biological Journal (Biologicheskii Zhurnal) Vol. VI, 1937, No. 3

KIRPICHNIKOV, V., mladshiy serzhant

Chemists on reconnaissance. Starsh.-serzh. no.7:18 Jl '62. (MIRA 16:6)

(Radioactivity--Safety measures)

SHILOV, F.G., redaktor; KIRPICHNIKOV, V.A., redaktor; ZLOBIN, M.V., tekhnicheskiy redaktor

[Karaganda's coal is for the motherland; a collection of articles by coal miners of the Karaganda Basin] Ugol' Karagandy - rodine; sbornik statei ugol'shchikov i shakhtostroitelei Karagandinskogo ugol'nogo basseina. Alma-Ata, Kazakhskoe gos. izd-vo 1956. 56 p. (MLRA 9:10)

(Karaganda Basin--Coal mines and mining)

KIRPICHNIKOV, V.M., insh.

Static characteristics of an asynchronous hollow-rotor induction machine. Trudy Ural. politekh. inst. no.90:183-190 '58.
(MIRA 13:2)
(Electric motors, Induction)

SHUBENKO, V.A., dotsent, kand.tekhn.nauk; IRPICHNIKOV, V.M., aspirant

Device for measuring the level and speed of teeming. Trudy Ural. politekh.inst. no.101:169-180 '60. (MIRA 14:3)
(Founding)

S/196/61/000/008/025/026
E194/E155

AUTHOR: Kirpichnikov, V.M.

TITLE: The operation of a differential amplifier-rectifier of the follow-up system with a capacitor induction motor operating on active load

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.8, 1961, 12-13, abstract 8K77. ("Tr. Ural'skogo politekhn. in-ta", 1960, 106, 100-115)

TEXT: The article describes the circuit of a differential amplifier intended to control a capacitor squirrel-cage miniature motor. An amplifier of this type is used in a double follow-up system to measure the rate and level when pouring steel into moulds by the syphon method. The amplifier employs the usual differential circuit consisting of two loops. Each loop has its source of supply and control resistance in the form of a triode. The common branch of the loops includes the load resistance. The circuit is used to amplify alternating current of supply frequency. General expressions are given for analysing the operation of the differential amplifier-rectifier. Operation of

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The operation of a differential ... S/196/61/000/008/025/026
E194/E155

The amplifier with constant displacement voltage and active load is considered, and also operation of the amplifier with positive feedback. The optimum value of capacitance of the automatic displacement capacitor was determined experimentally. It is proposed to employ an approximate substitution of the amplifier valves by three variable resistances, two of which serve to measure the angle of slope of the volt-ampere characteristic and the third to alter the displacement voltage.
12 literature references.

[Abstractor's note: Complete translation.]

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S/194/62/000/001/014/066
D201/D305

AUTHORS: Shubenko, V. A. and Kirpichnikov, V. M.

TITLE: Self-rectifying feedback amplifier working into the control winding of a capacitor miniature motor

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 1, 1962, abstract 1-2-21zh (Izv. vyssh. uchebn. zavedeniy. gorn. zh., 1961, no. 4, 137-145)

TEXT: The circuit of a self-rectifying amplifier with a frequency-dependent feedback is suggested. The circuit improves the harmonic content of the input current and the static properties of the electronic-amplifier-motor system. The feedback improves the operation speed of the auto-compensator since the revolution speed of the motor increases for the same time constants of the self-control system. The theoretical aspect of self-rectifying a.c. amplifiers with RC differentiating network feedbacks is considered. The mechanical characteristics of an ideal motor in an electronic-amplifier-motor system are given. Electric circuits of the ampli-

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S/194/62/000/001/014/066
D201/D305

Self-rectifying feedback ...

fier, graphs and oscillograms showing the operation of separate amplifier elements are given. 5 figures. 8 references. [Abstracter's note: Complete translation.]

VB

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KIRPICHNIKOV, V.M., inzh.

Low-power electronic rectifier using feedback. Izv.vys.ucheb.zav.; energ. 4 no.5:13-20 My '61. (MIRA 14:6)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova. Predstavlena kafedroy elektrifikatsii promyshlennykh predpriyatiy.
(Electric current rectifiers) (Electric power supply to apparatus)

ZENKIN, N.I., inzh.; KOKOVIKHIN, V.A., inzh.; KIRPICHNIKOV, V.M., inzh.

Using the mathematical modeling method for studying the electromagnetic transient performance of symmetrical asynchronous motors. Izv. vys. ucheb. zav.; gor. zhur. no.11:151-161 '61. (MIRA 15:1)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova. Rekomendovana vychislitel'nym tsentrom Ural'skogo politekhnicheskogo instituta.

(Electric motors, Induction)

KIRPICHNIKOV, V.M.

Experimental study of the equivalent parameters reduced to the control winding of an asynchronous condenser micromotor. Trudy Ural. politekh. inst. no.106:94-99 '60. (MIRA 15:5)
(Electric motors, Induction)

KIRPICHNIKOV, V.M.

Operation of a differential amplifier-rectifier of a servo system with an asynchronous condenser motor feeding and an active load. Trudy Ural. politekh. inst. no.106:100-115 '60. (MIRA 15:5)

(Servomechanisms)
(Amplifiers (Electronics))
(Electric motors, Induction)

SHUBENKO, V.A.; KIRPICHNIKOV, V.M.; TOMASHEVSKIY, N.I.

Automated a.c. servomotor with impulse speed control for the order system of automatic compensators and bridges. Trudy Ural. politekh. inst. no.106:116-121 '60. (MIRA 15:5)
(Servomechanisms)
(Metallurgical plants)

KIRPICHNIKOV, V. M., insh.

Equivalent circuits of electronic amplifiers of some automatic control devices in ore-dressing plants. Izv. vys. ucheb. zav.; gor. zhur. no.9:140-147 '61. (MIRA 15:10)

1. Ural'skiy politekhnicheskiy institut imeni S. M. Kirova. Rekomendovana kafedroy elektrifikatsii promyshlennykh predpriyatiy.

(Ore dressing) (Automatic control)
(Equivalent circuits)

KIRPICHNIKOV, V. M., aspirant

Equipment for the automatic photography of curves from the screen of an electron oscilloscope. Trudy Ural'. politekh. inst. no.119:124-126 '62. (MIRA 16:1)

(Oscillators, Electron-tube)
(Photography—Scientific applications)

KIRPICHNIKOV, V.M., inzh.

Graphic method of analyzing electronic amplifiers used in some automatic control devices. Izv.vys.ucheb.zav.; gor.zhur. 5 no.9:124-129 '62. (MIRA 15:11)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova. Rekomendovana kafedroy elektrifikatsii promyshlennykh predpriyatiy.
(Amplifiers, Electron-tube)

SHUBENKO, V. A., kand. tekhn. nauk, dotsent; KIRPICHNIKOV, V. M., aspirant

Equipment for the test reading of static mechanical characteristics of micromachines. Trudy Ural'. politekh. inst. no.119: 116-122 '62. (MIRA 16:1)

(Machinery—Testing)

ANISHCHENKO, Yevgeniy Ivanovich, aspirant; KIRPUCHNIKOV, Viktor Mikhaylovich, aspirant; SIUNOV, Nikolay Sergeyevich, doktor tekhn.nauk, prof.

Use of computer devices in the harmonic analysis of flux and e.m.f. of a synchronous machine. Izv.vys.ucheb.zav.; elektromekh. 5 no.9:985-993 '62. (MIRA 16:1)

1. Kafedra elektricheskikh mashin Ural'skogo politekhnicheskogo instituta (for Anishchenko). 2. Kafedra elektrifikatsii promyshlennykh predpriyatiy Ural'skogo politekhnicheskogo instituta (for Kirpichnikov). 3. Zaveduyushchiy kafedroy elektricheskikh mashin, rektor Ural'skogo politekhnicheskogo instituta (for Siunov).

(Electric machinery, Synchronous) (Magnetic circuits) (Electric network analyzers)

BRAYNIN, S.A.; KIRPICHNIKOV, V.M.

Level signaling device with cold cathode thyratron. Lit. proizv. no.2:10-11 F '63. (MIRA 16:3)
(Level indicators) (Thyratrons)

SHUBENKO, V. A., kand. tekhn. nauk; ZENKIN, N. I., inzh.; KIRPICHNIKOV, V. M., inzh.; AGAFONOV, Yu. P., inzh.

Some problems in the study of transient phenomena in asynchronous motors. Izv. vys. ucheb. zav.: gor. zhur. no.10:125-137 '61. (MIRA 15:10)

1. Ural'skiy politekhnicheskiy institut imeni S. M. Kirova (for Shubenko, Zenkin, Kirpichnikov). 2. Kurganskiy mashinostroitel'nyy institut (for Agafonov). Rekomendovana kafedroy elektrifikatsii promyshlennykh predpriyatiy Ural'skogo politekhnicheskogo instituta.

(Electric motors, Induction)
(Automatic control)

ZENKIN, N.I., assistent; KIRPICHNIKOV, V.M., assistent

Study of electromagnetic transient processes in asynchronous two-phase symmetric minature machines. Izv. vys. ucheb. zav.; gor. zhur. 6 no.3:105-110 '63. (MIRA 16:10)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova. Rekomendovana kafedroy vychislitel'noy tekhniki.

ZENKIN, N.I., inzh.; KIRPICHNIKOV, V.M., kand. tekhn. nauk

Combined method of determining the shock magnitude of electromagnetic moments in electric induction drive mechanisms. Izv. vys. ucheb. zav.; gor. zhur. 6 no.10:165-172 '63. (MIRA 17:2)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.

KAZAK, S.A., kand.tekhn.nauk; KIRPICHNIKOV, V.M., kand.tekhn.nauk; LEVISHKO, O.A., inzh.

Using mathematical models for the analysis of knocking in mechanisms of excavators and cranes taking into account elasticity and free play. Izv.vys.ucheb.zav.:gor.zhur. 7 no. 1:162-173 '64. (MIRA 17:5)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova. Rekomendovana kafedroy elektroprivoda i avtomatizatsii promyshlennykh ustanovok.

SHIMANSKIY, Yu.N.; VASANOVA, L.K.; KIRPICHNIKOV, V.M.; SYROMYATNIKOV, N.I.

Unit for high-speed recording of minor changes in temperatures. Izv.vys.ucheb.zav.; prib. 7 no.2:154-157 '64. (MIRA 18:4)

1. Ural'skiy politekhnicheskiy institut imeni Kirova. Rekomendovana kafedroy teoreticheskikh osnov teplotekhniki.