LUPANDIN, K.K.

New automatic circular knitting machines for stockings and socks.
Tekst.prom. 22 no.2:81-82 F '62.   (MIRA 15:3)
      (Knitting machines) (Manchester—Exhibitions)

LUPANDIN, N., inzhener-kapitan

How to use an instrument better. Vest. Vozd. Fl. no.12:80
D '61.   (MIRA 15:3)
        (Airplanes, Military—Maintenance and repair)

LUPANDIN, N., inzh.-mayor

Reliability of radio equipment has been increased.   Av.i kosm.   46
no.1:65-66   Ja '64.   (MIRA 17:3)

LUPANDIN, Nikolay Ivanovich

PHASE I BOOK EXPLOITATION   SOV/1713

25(1)

Lupandin, N., Milling Machine Operator, Kharkov Tractor Plant

Tvorcheskiy trud (Creative Labor) [Moscow] Izd-vo VTsSPS Profizdat,
1953. 73 p. 10,000 copies printed. (Series: Novatory sotsialist-
icheskogo proizvodstva)

Ed.: V.M. Pankova; Tech. Ed.: Z. Malek

PURPOSE: This booklet, written in a propagandistic vein, is ex-
tended for the general reader, particularly those engaged in the
milling industry.

COVERAGE: This booklet is a personal account of the author's life
traced from farm origins to work in a milling plant. As a mill-
ing machine operator he discusses various techniques in the mill-
of patterns and types of casting molds. Docent S.A. Vorob'yev,
Candidate of Technical Sciences, is listed as consultant. There
are no references given.

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SOV/1713

Creative Labor

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Creative Labor   SOV/1713

Dissemination of the Stakhanovite Experience   61

The Youth Grows Up   64

The Great Power of Competition   68

For the Benefit of the Fatherland   72

AVAILABLE: Library of Congress (TJ1225.L8)

GO/lsb
6-8-59

Card 3/3

LUPANDIN, N.I., inzh.-kapitan

For aircraft maintenance at night. Vest. Vozd. Fl. no.10:84
O '61.   (MIRA 15:2)
                    (Landing aids(Aeronautics))

LUPANDIN, V.

We are struggling for the title of a communist labor collective.
Den. i kred. 21 no.7:50-51 Jl '63.   (MIRA 16:8)

1. Zaveduyushchiy tsentral'noy sberegatel'noy kassoy Nyandomskogo
rayona Arkhangel'skoy oblasti.
                          (Nyandoma District--Savings banks)

SOV-113-58-9-13/19

AUTHOR: Korolev, S.I., Lupandin, V.I.

TITLE: A New Non-Hardening Mastic for Gaskets (Novaya netverdeyu-shchaya mastika dlya prokladok)

ABSTRACT: A mastic for gaskets of impregnated cardboard, paronite and pressed cork to be used in motor car engines was developed in 1947 by engineer L.M. Koposov. This LK mastic consisted of 45% of autonitroenamel 624^a, 40% of castor oil for technical use and 15% of solvent 646. The castor oil being too expensive a substance, laboratory experiments were made to find a suitable substitute. A product with similar properties was eventually found in the emulsifying agent from chemical wood pulp, tallol oil. A composition of 30% of this oil together with 70% nitroglyphtalic foundation proved satisfactory. Laboratory tests with 225 engines were successful. In June 1957, the Yaroslav   Engine Plant switched over to the new mastic, which resulted in over 31,000 rubles in annual savings.

Card 1/2

A New Non-Hardening Mastic for Gaskets   SOV-113-58-9-13/19

ASSOCIATION: Yaroslavskiy motornyy zavod (The Yaroslav   Engine Plant)

             1. Gaskets   2. Adhesives--Preparation   3. Adhesives--Applications

Card 2/2

FEDOTOV, D.D.; LUPANDIN, V.M.   (Moskva)

　　Activities of doctors-psychiatrists in the revolutionary move-
　　- nt in Russia. Trud, Gos. nauch.-issl. inst. psikh. 40:310-320
　　　　　　　　　　　　　　　　　　　　　　　(MIRA 17:7)
　　'63

LUPANDIN, V.M.

Materials on the history of Soviet child psychiatry.   Vop. psikh.
no.4:20-29 '60.   (CHILD PSYCHIATRY)   (MIRA 15:2)

LUPANDIN, V.M.

Role of progressive pedagogic influences in the 1860's in the
development of Russian pediatric psychiatry. Report No.1: View-
points of N.I. Pirogov, N.A. Dobroliubov, D.I. Pisarev, and
K.D. Ushinskii on neuropsychiatric disorders in children.
Pediatriia 39 no.1:66-70 '61.   (MIRA 14:1)

1. Iz Instituta psikhatrii AMN SSSR (dir. - prof. D.D. Fedotov).
        (CHILDREN--DISEASES)   (NEUROSES)

LUPANDIN, V.M.

History of the development of the preventive trend in child psychiatry. Trudy Gos.nauch.-issl.inst.psikh. 27:367-372 '61.
(MIRA 15:10)

1. Institut psikhiatrii AMN SSSR. Dir. - prof. D.D.Fedotov.
Nauchnyy rukovoditel' - prof. D.D.Fedotov.
(CHILD PSYCHIATRY)

LUPANDIN, V.M.

Clinical psychopathological analysis of periodical schizophrenia in
adolescents. Zhur. nevr. i psikh. 65 no.7:1056-1062 '65.   (MIRA 18:7)

1. Klinika detskikh psikhozov (zav. - prof. G.K.Ushakov) Instituta
psikhiatrii AMN SSSR, Moskva.

LUPANDIN, V. N.

Low-temperature sulfiding of cast-iron parts. V. N.
Lupandin, N. M. Genkin, and Yu. N. Pavlov (Automobile
Plant, Yaroslav). Avtomobil. i Traktor. Prom. 1957, No. 4,
39-41.—Samples were sulfided at 90-8° for 3 hrs. at 10-12 v.
and in baths contg. Na_2S 16, Na_2S 18-H_3PO_4 16, and $KSCN$
42-$Na_2S_2O_3$ 7.5g./l. all of them requiring frequent replenish-
ment. Abrasion testing of untreated parts and those sul-
fided in the above solns. gave, resp., 4.04, 5.2, 1.94, and 0.66.
Analysis of turnings showed 7-10% S in the first

tion of c.d. in building or lev...
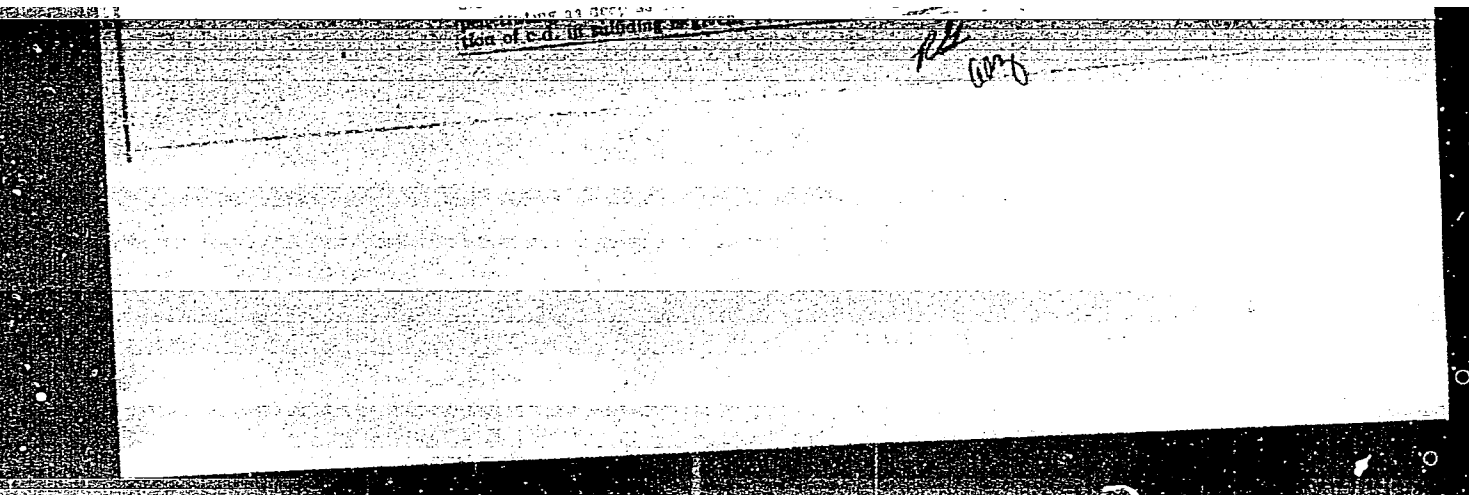
DOVNAR-ZAPOL'SKAYA, Nadezhda Markianovna; KOROLEVA, Nadezhda Sergeyevna;
KULAYEVA, Lyudmila Iosifovna; LUPANDINA, Ol'ga Sergeyevna;
NEMILOVA, Tat'yana Konstantinovna [deceased]; OSTROVSKAYA, Al'ma
Yul'yevna, dotsent, red.; GORDEYEVA, L.N., red.; YERMAKOV, M.S.,
tekhn.red.

[German-Russian mechanical and mathematical dictionary] Nemetsko-
russkii mekhaniko-matematicheskii slovar'. Pod red. IU.A.Ostrovskoi.
Moskva, Izd-vo Mosk.univ., 1960. 236 p.   (MIRA 13:9)
        (German language--Dictionaries--Russian)
    (Mathematics--Dictionaries)   (Mechanics--Dictionaries)

LUPANINA, R.V., inzh.

Two-rim spiral gear for the TO-16 machine. Tekst.prom. 22
no.9:80 S '62.   (MIRA 15:9)

1. Byuro tekhnicheskoy informatsii pryadil'no-trikotazhnogo
kombinata Khar'kovskogo soveta narodnogo khozyaystva.
                              (Textile machinery)

LUPANOSOV, V.P.; NOMOKONOV, V.P.; TEPLITSKIY, V.A.

Plotting temporary cross sections based on the data of the
"flat front" method. Razved. geofiz. no.3:23-27 '65.
(MIRA 18:8)

ACC NR: AT6028968   SOURCE CODE: UR/0000/65/000/000/0075/0083

AUTHOR: Lupanosov, V. P.; Nomokonov, V. P.; Ogorodnikov, V. V.;
Teplitskiy, V. A.

ORG: State Geological Committee of Industrial Production, TSSR
(Gosudarstvennyy proizvodstvennyy geologicheskiy komitet TSSR);
Moscow Geological Prospecting Institute im. S. Ordzhonikidze (Moskovskiy
geologorazvedochnyy institut).

TITLE: Results of applying the plane wave-front method in eastern
Turkmenia

SOURCE: Vsesoyuznyy seminar po novoy metodike seysmorazvedki.
Seysmorazvedka s primeneniyem gruppirovaniya vzryvov na dlinnykh bazakh
i sposoba tsentral'nykh luchey (Seismic prospecting using the grouping
of shots on long bases and the method of central rays); trudy seminara.
Moscow, Izd-vo Nedra, 1965, 75-83

TOPIC TAGS: seismic prospecting, seismic wave, underground explosion,
seismography

ABSTRACT: The investigations conducted using the plane wave-front
method (SPF) during 1959—1963 by the Amu-Darya Geophysical Expedition
are described. This work was done in areas with complex surface and

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ACC NR: AT6028968

subsurface seismological conditions. SPF was used successfully in areas lacking data from reflected waves, i.e., clear reflections and even diffracted waves formed in fault zones were obtained. The results of using SPF in fault zones were confirmed by deep drilling. Recording of reflections was performed not only within the limits of the generation profile but outside and perpendicular to the terminal sources. This made it possible to analyze boundaries with angles of inclination of 5—10° and get additional criteria for the formation of diffracted waves. Orig. art. has: 6 figures.

SUB CODE: 08/ SUBM DATE: 30Apr65/

Card 2|2,

LUPANOV, A.A.; BONDARENKO, M.N., redaktor; DEMIDOVA, L.F., tekhnicheskiy redaktor

["Kzyl Uzbekistan" Collective Farm; Ordzhonikidze District, Tashkent Province] Kolkhoz "Kzul Uzbekistan"; Ordzhonikidzevskogo raiona, Tashkentskoi oblasti. Tashkent, Gos. izd-vo Uzbekskoi SSSR, 1956. 28 p.   (MLRA 9:10)
          (Uzbekistan--Collective farms)

LUPANOV, A.A.; SALAKHUTDINOVA, A., tekhn. red.

[Crop rotation specializing in cotton and alfalfa] Utlok erlarda pakhta bilan bedeni elmashlab ekish. Toshkent, Uzbekiston SSR davlat nashrieti, 1960. 26 p. [In Uzbek]   (MIRA 14:10)
 (Rotation of crops) (Cotton) (Alfalfa)

MARIYENBAKH, L.M., doktor tekhnicheskikh nauk, professor; KITAYEV, B.I.,
       professor, doktor tekhnicheskikh nauk, retsenzent; KLETSKIN, G.I.,
       kandidat tekhnicheskikh nauk, retsenzent; LUPAKOV, B.P., inzhener,
       retsenzent; SUDAKIN, Ya.A., inzhener, redaktor; MATVEYEVA, Ye.N.,
       tekhnicheskiy redaktor.

       [Intensifying cupola operation] Intensifikatsiia vagranochnogo pro-
       tsessa. Moskva, Gos. nauchno-tekhn.izd-vo Mashinostroit. lit-ry,
       1954. 386 p.   (MIRA 8:4)
               (Cupola furnaces)

ZASLAVSKIY, Mikhail Leybovich,; MOSKVIN, P.P.,inzh.,retsenzent,; LUPANOV,
B.P.,inzh.,red.; MOLYUKOV, G.A.,inzh.,red.izd-va,; TIKHANOV,
A.Ya., tekhn. red.

[Pressure casting of reinforced and threaded parts] Lit'e pod
davleniem armirovannykh i rez'bovykh detalei. Moskva, Gos. nauchno-
tekhn. izd-vo mashinostroit. lit-ry, 1958. 163 p.   (MIRA 11:12)
(Die casting)

LUPANOV, D, I

SMELYAKOV, Nikolay Nikolayevich; FANBULOV, A.K., kand. tekhn. nauk, retsen-
zent; LUPANOV, D.P., inzh., red.; GERASIMOVA, Ye.S., tekhn. red.;
EL'KIND, V.D., tekhn. red.

[Reinforced castings] Armirovannye otlivki. Izd.2., perer. i dop.
Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958.
165 p.   (MIRA 11:10)

(Metal castings)

LuPANOV, B.P.

PHASE I BOOK EXPLOITATION   807/3109

25(1)

Vsesoyuznyy nauchno-issledovatel'skiy institut po normalizatsii v mashinostroyenii

Novoye v tekhnologii mashinostroyeniya (New Trends in Machinery Manufacture) Moscow, Mashgiz, 1959. 222 p. (Series: Its: Trudy, vyp. 1) Errata slip inserted. 5,500 copies printed.

Additional Sponsoring Agencies: USSR. Sovet Ministrov. Komitet standartov mer i izmeritel'nykh priborov.

Ed. (title page): O.B. Kardye, Doctor of Technical Sciences, Professor; Ed. (inside book): L.G. Produt'yeva; Tech. Ed.: A.F. Dvornova; Managing Ed. for Literature on Machine Building and Instrument Construction: N.V. Pokrovskiy, Engineer.

PURPOSE: This collection of articles is intended for the technical personnel of machine-building plants, design and construction bureaus, and scientific research organizations devoted to machine building. It may also be useful to the engineers and students in the machine-building colleges and technicums.

COVERAGE: This is the first number of the Transactions of VNINMASH (formerly VNIMMASH) on the theoretical and experimental work carried out by the All-Union Scientific Research Institute for Standardization of Machine Building in 1956-57. Subjects covered include investigations of new constructions and advanced methods in manufacturing machine parts for general machine building, hydraulic machinery, textile, sewing and other machines. The ten papers in this issue describe improvements in preparatory technique for making steel and iron castings, the progressive technique of making blanks for spinning rings by the closed die forging method, improvements in making parts for textile machines, and and and pumps and other machinery. Problems of automation in mass production of needles for sewing machines are discussed and the theory of deformation of rings with large curvature is presented. No personalities are mentioned. References accompany each article.

LUPANOV, B.P., inzh.; SAGUSYY, V.D., inzh.

The PMS-1 sand-blasting machine for making shell cores. Trudy
VNIINMASH no.1:17-26 '59.   (MIRA 13:5)
          (Coremaking)

18(5)

SOV/128-59-10-5/24

AUTHORS: Bogachev, A.F., Burtsev, A.D., Lakedemonskiy, A.V., Lupanov, B.P.,
             Andrianov, Ye.I., and Sagusyy, V.V., Engineers

TITLE: Exothermic Mixtures for the Heating of Risers

PERIODICAL: Liteynoye proizvodstvo, 1959, Nr 10, pp 17-21 (USSR)

ABSTRACT: The authors present a report on research which has been made on
             exothermic mixtures for the heating of risers. The qualities of
             already-known exothermic mixtures were investigated at the begin-
             ning of the research. The exothermic mixtures were divided into
             three groups, according to their oxygen balance of thermite and
             their chemical and granulate consistence. Bushed which are made
             of thermite mixture with additions, with coke ashes and with coke
             dross, give different results during combustion. These results are
             depending on their consistence, as figs.1a-r show. Table 1 shows
             different mixtures, their granularity and the percentage of dif-
             ferent components. The technology of preparing materials for mix-
             tures is not complicated. Aluminum chips and dross are at the
             same time exposed to crushing in grinding mills with the last

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SOV/128-59-10-5/24

I Exothermic Mixtures for the Heating of Risers

sifting through sieves of 1.5 mm. The rest repeatedly goes through
a grinding mill. The coke dross goes through a sieve of 6 mm. The
The bushes (Fig.2) are produced in wooden core moulds (Fig.3).
Special standards are elaborated for the dimensions of the bushes
(Table 4). Exothermic bushes, which are used in combination with
diaphragms, are made in the same core moulds as the usual ones.
The difference is that they have a center piece in the lower part
of the wooden inset which has the shape of the parting diaphragm
and dimensions according to table 7. The exothermic mixtures
which are used at MosZIL, are recommended for use in foundry pro-
duction. A.F. Yurasov, M.1. Averbukh, M.I. Kurlovich, P.S. Roman-
cv, N.P. Gritsko, V.I. Zheltov and P.I. Fedorov participated in
this study. There are 5 photographs, 3 diagrams and 9 tables.

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BURTSEV, A.D.; SAGUSHYY, V.V.; LUPANOV, B.P.; BOGACHEV, A.F.; SMIRNOV, G.P.;
ANDRONOVA, Ye.I.; GIZMAYYER, V.K.; PINES, A.V.; SHEVCHUK, R.S.;
NOSOV, Ye.S.; DOROSHENKO, S.P.; KUGEL', D.B.; ZOLOTNIKOV, N.M.;
SHPILENKO, A.M.; VASILYUK, A.P.; SVIRIDOV, I.A.

Using exothermic mixtures for heating the heads of steel castings.
Prom.energ. 15 no.6:14 Je '60.   (MIRA 13:7)
                    (Founding)

KAPLAN, S.A.; LUPANOV, G.A.

Relativistic instability of polytropic spheres. Astron.zhur. 42
no.2:299-304 Mr-Ap '65.   (MIRA 18:4)

1. Gor'kovskiy nauchno-issledovatel'skiy radiofizicheskiy institut.

LUPANOV, M. P.

Lupanov, M. P. andKoplevskiy, A. I.   "The therapy and prophylaxis of infectious stoma-
titis in rabbits", Karakulevodstvo i zverovodstvo, 1949, No. 1, p. 69-70

SO: U-3042, 11 March 53, (Letopis'nykh Statey, No. 10, 1949).

BAKHVALOV, S.V.; ZHIDKOV, N.P.; SAFRONOV, I.D.; LUPANOV. O.

Seventeenth mathematical olympiad for the schools of Moscow.
Usp.mat.nauk. 10 nol:213-219 '55.   (MLRA 8:6)
(Moscow--Mathematics)

LUPANOV, O. B.

2

Lupanov, O. B. On possibilities of synthesis of networks of diverse elements. Dokl. Akad. Nauk SSSR (N.S.) 103 (1955), 561–563. (Russian)

Bounds for the number of contacts required for the synthesis of arbitrary Boolean functions of n variables were given by Shannon [Bell System Tech. J. 28 (1949), 59–98; MR 10, 671]. If in addition to relay contacts, other elements such as electronic switching devices are used, can this lower bound be reduced? By the study of an abstract formulation of this problem it is shown that no significant improvement is possible.   C. Saltzer.

Math. Inst. im V. A. Steklov, AS USSR

LUPANOV, O.B.,

On rectifier and contact rectifier circuits. Dokl. AN SSSR 111
no.6:1171-1174 D '56.   (MLRA 10:3)

1. Matematicheskiy institut im. V.A. Steklova Akademii nauk SSSR.
Predstavleno akademikom P.S. Aleksandrovym.
                     (Electric current rectifiers)

LUPANOV, O.B. Cand Phys-Math Sci -- (diss) "On the synthesis of

contact schemes". Mos, 1953, 5 pp (Acad of Sci USSR. Division for Applied

Math.
Math Inst im V.A. Steklov). 160 copies. Bibliogr at end of the

text (12 titles). (KL, 37-58, 110).

- 3 -

LYAPUNOV, Aleksey Andreyevich; LUPANOV, O.B., red.; PIL'CHAK, B.Yu., red.; O.S. KULAGINA, red.; YABLONSKIY, S.V., red.; SMOLYANSKIY, M.L., red.; KOLESNIKOVA, A.P., tekhn.red.

[Problems in cybernetics] Problemy kibernetiki. Moskva, Gos. izd-vo fiziko-matem. lit-ry. No.1. 1958. 268 p. (MIRA 12:1)

1. Matematicheskiy institut AN SSSR (for Lyapunov, Kulagina)
(Cybernetics)

06522   SOV/141-58-1-12/14

AUTHOR: Lupanov, O. B.

TITLE: A Method of the Synthesis of Switching Circuits

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,
     1958, Nr 1, pp 120-140 (USSR)

ABSTRACT: A function describing the complexity of the circuits con-
     structed from the objects of a certain sequence

$$\mathfrak{N} = \left\{ \mathfrak{N}_1, \mathfrak{N}_2, \ldots, \mathfrak{N}_n, \ldots \right\}$$ of a set of objects (where

$\mathfrak{N}_n$ is an ensemble of all the functions of logic algebra,
having arguments n) can be represented in the following
manner. If to each investigated system S , corresponds
a real number L(S) ; this can be referred to as the sim-
plicity or complexity index. Further, it is possible to
consider the following functions: $L_f = \inf L_S$ where inf
is taken over all the systems S which realise the function
f ; $L_n = \sup L(f)$. Each function f of the logic algebra
can be given in the form of a table with two inputs (see

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A Method of the Synthesis of Switching Circuits

Table 1, p 121), where k and the distribution of the argu-ments $x_{i1},\ldots x_{ik}, x_{ik+1},\ldots, x_{in}$ in the table are regarded as being fixed. The matrix determining the values of the function f are denoted by $M(f)$. On the basis of the table it is shown that the function f can be represented as:

$$f(x_1,\ldots, x_n) = \bigvee_{j=1}^{p} f_j = \bigvee_{j=1}^{p}\bigvee_{h=1}^{t(j)} \left[\left(\bigvee x_{i_1}^{\sigma i_1}\ldots x_{ik}^{\sigma ik}\right)\cdot\left(\bigvee x_{i_{k+1}}^{\sigma ik+1}\ldots x_{i_n}^{\sigma i_n}\right)\right].$$

(1.1)

$$(\sigma_{i_1},\ldots, \sigma_{i_k})\in\sum_{jh}^{1} \quad (\sigma_{i_{k+1}},\ldots, \sigma_{i_n})\in\sum_{jh}^{2}$$

where $\bigvee$ denotes the disjunction. The representation of f in the form of Eq (1.1) is referred to as the correct representation of f, if the groups $A_1,\ldots,A_p$ have the same number s of lines. The numbers k and s are referred to as the parameters of this representation. A switching

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A Method of the Synthesis of Switching Circuits

tree of n arguments $x_1, \ldots, x_n$ forms a circuit having 1 input pole and 2^n output poles (or vice versa) and realises each function of the type $x_1^{\sigma 1} \, x_2^{\sigma 2} \ldots x_n^{\sigma n}$ between the input pole and one of the output poles. A 3-contact tree is shown in Fig 1. Fig 3 shows a circuit whose function is given in Table 2 on p 123. The method of construction adopted in Fig 3 permits the variation of the distribution of the arguments in groups. Another method of the construction of switching circuits is indicated in Fig 4. In this case the function f is represented in Table 3, p 124. The matrices M_1 and M_2 are the matrices of f_1 and f_2 which refer to the arguments x_1, x_2, x_3 ($f = f_1 \vee f_2$). The complexity of this type of circuit can be estimated by finding a function $L(n)$ which represents the minimum number of contacts (or switches) sufficient for the realization of an arbitrary function of the

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A Method of the Synthesis of Switching Circuits

logic algebra having n arguments; in other words the
simplicity index of the circuit is expressed by the number
of its contacts. A theorem is given which shows that:

$$L(n) < \frac{2^{n+1}}{n} (1 + O(1)) \ .$$

The load of the i-th relay or switch in a circuit is the
number of contacts x_i and $\bar{x}_i$ in the circuit, and M(n)
is a minimum number, such that the circuits with a maximum
relay load not exceeding M(n) can realize an arbitrary
function of the logic algebra with n arguments (C. E.
Shannon, Ref 20). A theorem is given which shows that:

$$M(n) < \frac{2^{n+1}}{n^2} (1 + O(1)).$$

The synthesis of parallel-series switching circuits can be
performed on the basis of the principal logic functions:
conjunction, disjunction and negation. With regard to this
Card 4/7 type of circuits, the Finikov theorem states that:

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A Method of the Synthesis of Switching Circuits

$$L_r^{II}(n) \leqslant 2n + r2^{r-1}$$

where $L^{II}(f)$ (and $L_r^{II}(n)$ and $L^{II}(n)$) is the minimum number of the variables sufficient for the realization of a given function f . The symbol r is the number of the arguments where the function is equal to 1 . The parallel-series synthesis is represented by the matrix on p 127 and by the circuit of Fig 5. For this system it is shown that:

$$L^{II}(n) < \frac{2^{n+1}}{lg_2 n} (1 + 0(1)) .$$

Further, it is possible to consider the circuits which are constructed from the so-called functional elements, that is, the elementary sub-circuits which have a certain number of

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A Method of the Synthesis of Switching Circuits

input poles and a single output pole. To each functional
element E it is possible to ascribe a positive real number
P(E) which represents its weight. The simplicity index
L(S) of a system S can be determined as the sum of the
weights of all the functional elements in S . The nor-
malized weight p(E) of a functional element E is defined
as P(E)/(s - 1) . For the circuit consisting of functional
elements it is shown that:

$$L(n) \sim (\min p\ (E)) . \frac{2^n}{n}$$

The proof of this theorem is given in 3 parts. First, a
number of auxiliary theorems are demonstrated which also
describe the method of synthesis. Secondly, the method of
synthesis is illustrated in an example and the upper esti-
mate for the equation is found. Finally, the lower estimate

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A Method of the Synthesis of Switching Circuits

is determined. The paper contains 11 figures, 3 tables and
20 references, of which 12 are Soviet, 7 English and 1
German.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova, AN SSSR
(Mathematical Institute imeni V. A. Steklov, Academy of
Sciences, USSR)

SUBMITTED: April 14, 1957.

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LUPANOV, O.B.

Possibilities for synthesizing circuits from random elements.
Trudy Mat.inst. 51:158-173 '58.   (MIRA 11:11)
    (Electric circuits)   (Logic, Symbolic and mathematical)

AUTHOR: Lupanov, O.B.   20-119-1-5/52

TITLE: The Synthesis of Contact Circuits (O sinteze kontaktnykh skhem)

PERIODICAL: Doklady Akademii Nauk, 1958, Vol 119, Nr 1, pp 23-26 (USSR)

ABSTRACT: Let A be a certain method for the synthesis of contact circuits.
             Let $L_A(n)$ be the minimal number of contacts being sufficient
             for the realization of an arbitrary function of n arguments
             with the method A. Shannon [Ref 1] has shown that

$$(1-\varepsilon)\,\frac{2^n}{n} < L(n) < (1+\varepsilon)\,\frac{2^{n+2}}{n} \; .$$

The author proposes a method D for which $L_D(n)$ asymptotically

equals $\frac{2^n}{n}$; herewith at the same time it is shown that

$$L(n) \sim \frac{2^n}{n} \; .$$

Furthermore, the estimation due to Shannon $\frac{2^n}{n} \lesssim k(n) \lesssim \frac{2^{n+1}}{n}$

and $\frac{2^n}{n^2} \lesssim M(n) \lesssim \frac{2^{n+2}}{n^2}$ are improved:

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The Synthesis of Contact Circuits

$$k(n) \sim \frac{2^n}{n} \ , \quad M(n) \sim \frac{2^n}{n^2} \ .$$

There are 5 references, 2 of which are Soviet.

PRESENTED: October 7, 1957, by M.V.Keldysh, Academician
SUBMITTED: October 1, 1957

Card 2/2

16($_1$)

AUTHOR: Lupanov,O.B.   SOV/20-126-3-10/69

TITLE: Asymptotic Estimates of the Number of Graphs With n Edges

ABSTRACT: Let G be the set of all graphs without isolated corners; let
G^1, G^2, G^3 be subsets of G consisting of connected graphs, graphs
without parallel edges and graphs without loops. Let

$$G_0{}^i = G^i \ , \quad G_1{}^i = G \quad (i=1,2,3)$$

$$G_{\delta_1,\delta_2,\delta_3} = G^1_{\delta_1} \cap G^2_{\delta_2} \cap G^3_{\delta_3} \quad (\delta_i=0,1 \text{ for } i=1,2,3).$$

Let $G_{\delta_1,\delta_2,\delta_3}(n)$ be the set of graphs of $G_{\delta_1,\delta_2,\delta_3}$ with n edges.

Let $G_{\delta_1,\delta_2,\delta_3}(n)$ be the number of elements in $G_{\delta_1,\delta_2,\delta_3}(n)$.

Theorem:

$$G_{\delta_1,\delta_2,\delta_3}(n) = \left(\frac{2}{1}\frac{n}{\ln^2 n}\ \delta_{\delta_1,\delta_2,\delta_3}(n)\right)^n \ ,$$

where

$$\frac{2\ln \ln n}{\ln n} \lesssim \delta_{\delta_1,\delta_2,\delta_3}(n)-1 \lesssim \frac{4\ln \ln n}{\ln n}$$

Card 1/2

Asymptotic Estimates of the Number of Graphs
With n Edges   SOV/20-126-3-10/69

and $\alpha \lesssim \beta$ means that $\varlimsup_{n \to \infty} \frac{\alpha}{\beta} \leqslant 1$.

Theorem: The part of graphs of $G_{\delta_1, \delta_2, \delta_3}(n)$ possessing k corners,

where $\left| k - \frac{2n}{\ln n} \right| > \frac{Cn(\ln \ln n)^{1/2}}{(\ln n)^{3/2}}$, tends to zero for increasing n
(C - constant).

Several conclusions are given. The author mentions F.Ya.
Vetukhnovskiy.

There are 9 references, 6 of which are Soviet, 2 American,
and 1 German.

ASSOCIATION: Matematicheskiy institut imeni V.A.Steklova Akademii nauk SSSR
(Mathematical Institute imeni V.A.Steklov, AS USSR)

PRESENTED: February 6, 1959, by M.V.Keldysh, Academician

SUBMITTED: January 29, 1959

Card 2/2

16(1)   SOV/20-128-3-8/58

AUTHOR: Lupanov, O.B.

TITLE: Asymptotic Estimates of the Complexity of the Formulas Which
             Realize the Functions of Logic Algebra

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 128,Nr 3,pp464-467(USSR)

ABSTRACT: The paper is a continuation of the publications $\left[\text{Ref } 3,4,5\right]$
             of the author. He obtains an asymptotic expression for the
             minimum complexity which is sufficient for realizing an arbi-
             trary function of logic algebra with n arguments in a finite

             basis. Riordan and Shannon $\left[\text{Ref } 1\right]$ showed that $L_{\sqcap}(n) \geqslant \dfrac{2^n}{\lg_2 n}$,

             the author $\left[\text{Ref } 4\right]$ showed that $L_{\sqcap}(n) \leqslant \dfrac{2^{n+1}}{\lg_2 n}$. Now he con-

             cludes from a more general theorem 2 (see "Problems of Cyber-

             netics" 3, 1959): $L_{\sqcap}(n) \sim \dfrac{2^n}{\lg_2 n}$. All together the author

             gives four theorems with several conclusions. He mentions
             R.Ye.Krichevskiy and B.I.Finikov.
Card 1/2

SOV/20-128-3-8/5 €

Asymptotic Estimates of the Complexity of the Formulas Which Realize
the Functions of Logic Algebra

There are 2 figures, and 9 references, 6 of which are Soviet,
and 3 American.

ASSOCIATION: Matematicheskiy institut imeni V.A.Steklova AN SSSR
(Mathematical Institute imeni V.A.Steklov AS USSR)
PRESENTED: May 27, 1959, by M.V.Keldysh, Academician
SUBMITTED: May 26, 1959

Card 2/2

LUPANOV, O. B.

"Concerning One Class of Networks Made of Functional Elements"
(2, 9, 16, 23, and 30 October 1959). (Now in press in the collection
"Problemy kibernetiki")

paper delivered at the Moscow State University in 1959/1960 academic year at
the seminar on mathematical problems of cybernetics under the leadership of
S. V. Yablonskiy

LuPANOV, O.B.

PHASE I BOOK EXPLOITATION   SOV/4279

Problemy kibernetiki, vyp. v (Problems of Cybernetics, no. 4) Moscow,
Fizmatgiz, 1960. 257 p. 10,000 copies printed.

Compilers: G.V. Vakulovskaya, T.L. Gavrilova, B.Yu. Pil'chak, Ya.I. Starobogatov,
V.S. Shtarkman, and S.V. Yablonskiy; Eds.: G.V. Vakulovskaya, Ya.I. Starobogatov,
and B.I. Finikov; Tech. Ed.: S.N. Akhlamov; Chief Ed.: A.A. Lyapunov.

PURPOSE: This book is intended for mathematicians and scientists interested in the
problems of cybernetics and systems control.

COVERAGE: The book is a collection of articles on cybernetics, the theory of control
systems, information theory, programming, computers, control processes in living
organisms, and mathematical linguistics. The author thanks the following persons
for their assistance: F. Ya. Vetukhnovskiy, A.P. Yershov, V.M. Zolotarev, V.K.
Korobkov, V.I. Levenshteyn, O.B. Lupanov, B.A. Sevast'yanov, and M.L. Tsetlin.
References accompany several of the articles.

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Problems of Cybernetics, no. 4   SOV/4279

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VI. CONTROL PROCESSES IN LIVING ORGANISMS

VII. PROBLEMS OF MATHEMATICAL LINGUISTICS

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Problems of Cybernetics, no. 4

SOV/4279

Kulagina, O.S. On Machine Translation From French Into Russian.
II. Algorithm for Translation From French Into Russian

AVAILABLE: Library of Congress

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LUPANOV   O. B.

P. 2

PHASE I BOOK EXPLOITATION   SOV/4073

Problemy kibernetiki, vyp. 3 (Problems in Cybernetics, No. 3) Moscow,
    Fizmatgiz, 1960. 282 p. 15,000 copies printed.

Ed.: Aleksey Andreyevich Lyapunov ; Comp. and eds.: O. S. Kulagina,
    O. B. Lupanov, B. Yu. Pil'chak, S. V. Yablonskiy, and Yu. I. Yanov.

PURPOSE: This book is intended for specialists in cybernetics, machine trans-
    lation, and computers.

COVERAGE: This book contains articles on problems in cybernetics, programming,
    mathematical linguistics, machine translation, the theory of control systems,and
    the theory of digital computers. In particular, the book discusses questions
    dealing with the effective use of computers. The proceedings of the seminar
    on cybernetics held in 1958-1959 at Moscow University under the direction of
    A. A. Lyapunov and of the conference on mathematical linguistics held April
    15-24, 1959, in Leningrad are described. The editors thank M. L. Tsetlin,
    I. B. Zadykhaylo, V. S. Shtarkman, and G. V. Vakulovskaya. References ac-
    company each article.

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S/582/60/000/003/003/009
D234/D305

AUTHOR: Lupanov, O.B. (Moscow)

TITLE: On the complexity of realizing the functions of logical algebra by formulae

SOURCE: Problemy kibernetiki, no. 3, Moscow, 1960, 61 - 80

TEXT: The author obtains an asymptotic expression for a function L(n) characterizing the complexity of formulae constructed from the functions of a certain basis satisfying specified conditions, n being the number of the arguments. The author gives as an example application of the formula to the function estimating the number of contacts in parallel-series circuits, but states that the asymptotic expression for the latter can be obtained directly in a simpler way. The results are based on lower estimations of the index of simplicity by K.Ye. Krichesvskiy (Ref. 3: Problemy kibernetiki, no. 2, 1959, 123-138) and previous works of the author; facts from the theory of self-correcting codes are also used. It is stated that the basic result can be extended to the case of functions of k-va- $\sqrt{b}$

Card 1/2

On the complexity of realizing ...   S/582/60/000/003/003/009
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lued logic. There are 2 tables and 11 references: 7 Soviet-bloc and
4 non-Soviet-bloc. The references to the English-language publica-
tions read as follows: J. Riordan, C.E. Shannon, Journ. of Math.
and Phys. 21, 2, 1942, 89-93; C.E. Shannon, Bell. Syst. Techn. J.,
28, 1, 1949, 59-98; R.W. Hamming, Bell. Syst. Techn. J., 29, 1,
1950, 147-160; E.L. Post, Amer. J. Math., 43, 1, 1921, 163-185.

SUBMITTED: March 31, 1958

Card 2/2   VB

27636
S/194/61/000/002/018/039
D216/D302

$9,3230 \; (1013)$

AUTHOR: Lupanov, O.B.

TITLE: Asymptotic evaluation of frames and meshes with n branches

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 2, 1961, 34, abstract 2 V261 (V sb. Probl. kibernetiki, no. 4, M., Fizmatgiz, 1960, 5-21)

TEXT: The component frames and meshes (frames with separated out sub-groups of vertices) which have no parallel branches or loops are considered. It is proved that for a number $\overline{G}(n)$ of non-isomorphic frames of this kind with n branches the following relationship is true:

$$\ln \overline{G}(n) = n \ln n - 2n \ln \ln n + (\ln 2 - 1) n + \gamma'(n),$$

where

$$\frac{2n \ln \ln n}{\ln n} \lesssim \gamma'(n) \lesssim \frac{4n \ln n}{\ln n},$$

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and $\alpha(n) \lesssim \beta(n)$ means that $\overline{\lim_{n \to \infty}} \frac{\alpha(n)}{\beta(n)} \leq 1$. It is shown that the portion of frames (meshes) with k modes and satisfying the condition

$$| k - \frac{2n}{\ln n} | > \frac{14 \; n \; (\ln \ln n)^{1/2}}{(\ln n)^{3/2}},$$

tends to zero with increasing n. The given asymptotic evaluations of the number of graphs and meshes can be used in certain evaluations of complexity of control systems. 18 references.

Card 2/2

LUPANOV, O.B.,(Moskva)

Resolution of functions of the algebra of logic by formulas of
finites classes (formulas of limited depth) in the base &,V,⁻.
Probl. kib.   no.6:5-14 '61.   (MIRA 15:1)
                    (Logic symbolic and mathematical)

20350

S/020/61/136/005/008/032
B104/B204

16.3500
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AUTHOR: Lupanov, O. B.

TITLE: Representation of the functions of algebraic logics by
formulas of limited depths on the basis $\&$,$\lor$,

PERIODICAL: Doklady Akademii nauk SSSR, v. 136, no. 5, 1961, 1041-1042

TEXT: An important place in mathematical problems of cybernetics is held
by the study of asymptotic rules of control systems. The "efficiency" or
"productivity" of a control system may be judged by means of functions of
a certain class, which hold for these systems. In the present paper,
formulas of limited depth on the basis $\&$,$\lor$, are investigated, which
comprise the disjunctive and conjunctive normal forms, together with their
generalizations. Furthermore, it is shown that, from the point of view
of asymptotic functions according to Shannon, formulas of depth 3 are
equivalent to formulas of greater depths. Further, the author inductively
defines some special classes of formulas, which are generalizations of the
disjunctive and conjunctive normal forms. He assumes in this connection
that class $A_\lor^o = A_\&^o$ consists of the following formulas:

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B104/B204

Representation of the functions...

x_1, x_2,....,x_n,....., $\bar{x}_1$, $\bar{x}_2$, ..., $\bar{x}_n$..... . Class $A_\vee^k$ is defined in the

following manner: 1) $A_\&^{k-1} \subseteq A_\vee^k$; 2) If $F_1 \in A_\vee^k$, $F_2 \in A_\vee^k$, then also

$(F_1 \vee F_2) \in A_\vee^k$; 3) class $A_\vee^k$ contains no other formulas except those

defined in 1) and 2). It is further assumed that $A^\infty = \bigcup\limits_{k=0}^{\infty} A_\vee^k$, and it is

moreover obvious that $\bigcup\limits_{k=0}^{\infty} A_\vee^k = \bigcup\limits_{k=0}^{\infty} A_\&^k$. Then, e.g.,

$$(((x_1 \& x_2) \vee (\bar{x}_1 \& x_3)) \vee x_4) \in A_\vee^2;$$
$$((((x_1 \vee (x_2 \& x_3)) \& x_4) \vee \bar{x}_5) \& (\bar{x}_1 \vee \bar{x}_3)) \in A_\&^2. \qquad (1)$$

In the following, the author in the usual manner introduces the Shannon

function. $L_f^k(f)$ is assumed to be sufficient for the lowest number of

symbols of the variable for realization of function f, which corresponds

to any function of algebraic logics of n arguments, with formulas from

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Representation of the functions...

class A_ξ^k (k = 2, 3, ...; ξ = V, &, or k = ∞ and ξ is an "empty" symbol).
In the sense of the principle of duality, $L_V^k(n) = L_\&^k(n)$ holds, and this
quantity is denoted by $L^k(n)$. If the Shannon function is essentially
defined in this manner (where the number of brackets does not influence
the complex nature of the formulas), then A_V^2 is a class of disjunctive
normal forms, $A_\&^2$ a class of conjunctive normal forms, A^3 a class of "sums
of products of sums" of the variable or its negations, etc. In this sense,
the formulas (1) are "equivalent" to formulas $x_1 x_2 \vee \bar{x}_1 x_3 \vee x_4$;
$((x_1 \vee x_2 x_3)x_4 \vee \bar{x}_5)(\bar{x}_1 \vee \bar{x}_2)$. It may easily be understood that

$L^2(n) \geqslant L^3(n) \geqslant \ldots \quad L^k(n) \geqslant \ldots \geqslant L^\infty(n)$. The following theorem is given:
with $k \geqslant 3$, $L^k(n)$ is $\sim 2^n/\log_2 n$, where for any $\varepsilon > 0$ the fraction of the
function f from the arguments $x_1, \ldots, x_n$, for which

$\min(L_V^k(f), L_\&^k(f)) \leqslant (1-\varepsilon)2^n/\log_2 n$ holds, tends toward zero with growing n.
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This result is definite in a certain sense, as with $n \geqslant 2$ is known to be $L^2(n) = n2^{n-2}$. The proof of the theorem, which shows that $L^\infty(f) \leqslant (1-\varepsilon)2^n/\log_2 n$, consists in indicating the construction method for each function $f(x_1, \ldots, x_n)$ of algebraic logics with formulas from $A_\vee^3$, which asymptotically do not contain more than $2^n/\log_2 n$ symbols of variables. This method makes it also possible to construct asymptotically the best formulas from $A_\vee^k$ ($k \geqslant 3$), for nearly all functions because $A_\vee^3 \subset A^k$. There are 9 references: 5 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Akademii nauk
SSSR (Institute of Mathematics imeni V. A. Steklov of the
Academy of Sciences USSR)

PRESENTED: August 5, 1960, by M. V. Keldysh, Academician

SUBMITTED: August 2, 1960

Card 4/4

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28664
S/020/61/140/002/009/023
B109/B125

AUTHOR: Lupanov, O. B.

TITLE: The local coding principle and the realization of functions
            of certain classes by schemes consisting of functional
            elements

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 2, 1961, 322-325

TEXT: Almost any function of algebraic logic allows only a very complex
schematic representation. The author continues the work of C. E. Shannon
(Ref. 1: Trans. AIEE, 57, 713 (1938); Ref. 2: Bell. Syst. Rechn. J., 28,
no. 1, 59 (1949)), S. V. Yablonskiy (DAN, 124, no. 1, 44 (1959)) and A.
Sh. Blokh (DAN, 111, no. 5, 1017 (1956)), and shows that the local coding
principle allows for many classes of functions an essentially simpler
schematic representation than in the general case. Definitions: B_n is a
set of subsets $(d_0, \ldots, d_{n-1})$ (zero-one elements); the representation B_n
in B_m is characterized by the (n,m) operator; the $(n,1)$ operator is a

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function of algebraic logic with the arguments $x_1,\ldots,x_n$; P is the weight of each element E by which a function depending on k (>1) elements is realized. f is the least reduced weight of the basis elements; the Shannon function is introduced as usual; if F is an operator, $L(F)$ will be the lowest complexity of connections by which F is realized. f is a finite set of operators; $\widetilde{\sigma}$ is a set from B_n; $(\pi_0,\ldots,\pi_n)$ is a set for the symmetrical function $(x_1,\ldots,x_n)$; $|\widetilde{\sigma}|$ (where $\widetilde{\sigma}=(\sigma_0,\ldots,\sigma_{k-1})$) denotes

the number $\sum\limits_{i=0}^{k-1}\sigma_i 2^i$; $\widetilde{\sigma}(k,q)$ defines $\widetilde{\sigma}$ with $|\widetilde{\sigma}|=q$, where $0\leqslant q<2^k$.

$\widetilde{\pi}=(\pi_0,\ldots,\pi_{R-1})$ is a certain sequence; the sequence $(\pi_s,\ldots,\pi_{s+t})$ (where $\pi_i=0$ for $i\geqslant R$) is denoted by $S_{s,t}(\widetilde{\pi})$ or by $S(\widetilde{\pi},\widetilde{\sigma}(r,s),\widetilde{\sigma}(r,f))$, where $r=]\log R[,(]a[$ least integer; furthermore, $B_{h,m}(h+]\log h[+m,2^m)$ is supposed to be an operator transforming $(\widetilde{\alpha},\widetilde{\beta},\widetilde{\gamma})$; $\widetilde{\alpha}=(\alpha_0,\ldots,\alpha_{h-1})$,

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$\bar{\beta} = (\beta_0, \ldots, \beta] \log[1)$, $\tilde{\gamma} = (\gamma_0, \ldots, \gamma_{m-1})$ into $(\delta_0, \ldots, \gamma_{2^m = 1})$ such that

$(\delta_0, \ldots, \delta_{|\bar{\gamma}|}) = S(\tilde{\alpha}, \tilde{\beta}, \tilde{\gamma})$ and $\delta_1 = 0$ for $1 > |\tilde{\gamma}|$. Local coding principle:

It is assumed that $\mathcal{F} = (\mathcal{F}_1, \ldots, \mathcal{F}_n, \ldots)$, where $\mathcal{F}_n$ contains only (n, m_n)

operators. A sequence $\tilde{\pi}^{(F)} = (\pi_0^{(F)}, \ldots, \pi_{h_{n-1}}^{(F)})$ of the length h_n

consisting of 0 and 1 can be assigned to each F from $\mathcal{F}_n$. Furthermore,

the $(n, m_{1,n})$ operator $A_F^{(1)}$, $m_{1,n} =]\log h_n[$; the $(n, m_{2,n})$ operator $A_F^{(2)}$;

and the $(n+2^{m_{2,n}}, m_n)$ operator $A_F^{(3)}$ are supposed to be such that

$$F(\tilde{x}) = A_F^{(3)}(\tilde{x}, B_{h_n, m_{2,n}}(\tilde{\pi}^{(F)}, A_F^{(1)}(\tilde{x}), A_F^{(2)}(\tilde{x}))).$$ (1).

(A)

$$A_F(\sigma(\tilde{m}_{1,n} - l_n, k)) = S_{k, l_{n,2}l_n + 2^{m_{2,n}}}(\tilde{\pi}^{(F)}).$$

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is valid, if

$$A_F^{(11)} (\tilde{x}) = S_{0, l_n}(A_F^{(1)} (\tilde{x})), \quad A_F^{(12)} (\tilde{x}) = S_{l_n, m_n - l_n} (A_F^{(1)} (\tilde{x})). \tag{B}$$

then

$$B_{l_n, m_{2,n}} (\tilde{\pi}^{(F)}, A_F^{(1)} (\tilde{x}), A_F^{(2)}(\tilde{x})) = B_{2^{l_n} + 2^{m_{2,n}}, m_{2,n}} (A_F (A_F^{(11)}(\tilde{x})),$$
$$A_F^{(11)} (\tilde{x}), A_F^{(2)} (\tilde{x})). \tag{2}$$

since both $A_F^{(11)}$ and $A_F^{(12)}$ are realized by the connection representing $A_F^{(1)}$. Supposing that $H(\mathcal{F}_n)$ is the logarithm with the base 2 of the operators from $\mathcal{F}_n$ and $\lambda(n) = H(\mathcal{F}_n)/\log H(\mathcal{F}_n)$, then theorem 1 is valid: If

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$$\left| \begin{array}{l} \frac{n+m_n}{\lambda(n)} \to 0, \quad h_n \sim H(\mathfrak{F}_n), \quad 2^{m_{2,n}} = o(\lambda(n)), \\ L(A_F^{(l)}) = o(\lambda(n)), \quad l = 1, 2, 3. \end{array} \right|$$ (c)

holds, $L(\mathcal{F}_n) \sim \int \dfrac{H(\mathcal{F}_n)}{\log H(\mathcal{F}_n)}$. An important special case of the principle

of parametrization: If $m_{2,n} = 0$, then

$$F(\tilde{x}) = A'_F\left(\tilde{x}, \tilde{\pi}\Big|_{A_F(\tilde{x})}^{(F)}\right).$$ (D)

is valid. Results obtained from the local coding principle: A) functions
with a given number of units: It is assumed that $\|f\|$ denotes the number
of sets from B_n, where $f(x_1,\ldots,x_n)$ is equal to unity and $\mathcal{K}_{n,k}$ is the class
of all functions $f(x_1,\ldots,x_n)$, for which $\|f\| = k$; furthermore, $l(n,k)$ is

supposed to be equal to min $(k, 2^n - k)$. Then theorem 2 is valid:

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$$
\begin{cases}
\dfrac{I(n,\,k(n))}{\log n} \to \infty. \\[2mm]
L(\Re_{n,k(n)}) \sim \rho\,\dfrac{\log C_{2^n}^{k(n)}}{\log \log C_{2^n}^{k(n)}}.
\end{cases}
$$

(E)

if $\dfrac{I(n,k(n))}{\log n} \longrightarrow \infty$. Supposing $\mathcal{H}_n$ is the class of all functions

$f(x_1,\ldots,x_n)$, $L(n) = L(\mathcal{H}_n)$, and M_n is the class of all f for which

$L(f)=L(n)$, theorem 3 will be valid on the condition that

$\varDelta(n) = \max\limits_{f\in M_n} |\ \|f\| - 2^{n-1}|$; $\varDelta(n) < C \cdot 2^n (\dfrac{\log n}{n})^{1/2}$, where C is a certain

constant. This follows especially from $L(n) - \rho\dfrac{2^n}{n} \backsim \dfrac{2^n \log n}{n^2}$. B) Monotone

operators: An (n,m) operator is referred to as monotone if $|F(\tilde{\alpha}) \leqslant F(\tilde{\beta})|$

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follows from $|\tilde{\alpha}| < |\beta|$. If $\mathfrak{M}_n$ stands for the class of all monotone (n,n) operators, theorem 4 will be valid: $L(\mathfrak{M}_n) \sim \rho \frac{2^{n+1}}{n}$. C) Symmetrical operators: If $\sigma_{n,m}$ is taken as the class of all systems $(f_1(x_1,...,x_n),...,f_m(x_1,...,x_n))$ of the symmetrical functions of algebraic logic, theorem 5 will be valid: $L(\sigma_{n,1}) \asymp n$. Theorem 6 is valid provided that $\frac{m(n)}{\log n} \to \infty$: $L(\sigma_{n,m(n)}) \sim \frac{\rho \cdot nm(n)}{\log(nm(n))}$. There are 15 references: 13 Soviet and 2 non-Soviet.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR (Institute of Mathematics imeni V. A. Steklov of the Academy of Sciences USSR)

PRESENTED: May 6, 1961, by P. S. Novikov, Academician

SUBMITTED: April 27, 1961

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S/582/62/000/007/003/008

I004/I204

AUTHOR: Lupanov, O. (Moscow)

TITLE: A certain class of nets composed of functional elements (formulas with a partial memory)

PERIODICAL: Problemy kibernetiki, no. 7, 1962, 61–114

TEXT: A certain class of nets composed of functional elements is studied from the point of view of the complexity of realization using these nets of logic algebra functions. Nets in which the output of each element is connected with a small number of inputs of other elements are investigated. These are considered as useful for computing the values of functions in which each intermediate result is used only a few times. An asymptotic expression for the Shannon function for such nets is obtained. In particular the above limitation does not affect asymptotically the complexity of the net for almost all functions provided some relation exists between the weights of the elements, the number of their inputs, and the number of inputs of other elements. The proof begins firstly with a particular case, in which the nets are constructed for conjunction, disjunction and negation, and the input of each element may be connected to not more than two inputs of other elements. The general case is then treated. Transformations of logic algebra functions are exhibited by means of a dichotomic tree. Representation of function by both special and simple functions is considered.

A theorem states that $L_z^D(n) \sim C_z^D 2^n/n$, where C_z^D is the minimal of the numbers $\dfrac{R(i_1, j_1, i_2, j_2)}{Q(i_1, j_1, i_2, j_2)}$ under condition.

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A certain class...

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1004/1204

$$i > 1, \ j_1, i_2, j_2 > 0, \quad i_1 \geqq j_1, \quad i_2 < j_2,$$
$$R(i_1, j_1, i_2, j_2) > 0, \quad Q(i_1, j_1, i_2, j_2) > 0.$$

where $L_e^D(n) = $ Shannan, func.

The meaning of the constant C_e^D is as follows. It is the smallest of all "specific complexities" of the nets (the "specific complexity" is defined as the complexity of the net divided by the number of outputs minus one) for which the number of inputs is not less than the number of outputs (with some other conditions).

SUBMITTED: September 15, 1959 (originally)
             January 17, 1961 (after revision)

Card 2/2

LUPANOV, O.B.

Relative complexity of the realization of monotonic functions,
which contain only closing contacts, as compared with contact
circuits. Dokl. AN SSSR. 144 no.6:1245-1248 Je '62.   (MIRA 15:6)

1. Matematicheskiy institut im. V.A.Steklova Akademi: nauk SSSR.
Predstavleno akad. A.I. Bergom.
              (Cybernetics) (Electric circuits)

LUPANOV, O.B. (Moskva)

      Comparison of two types of finite sources. Probl. kib. no.9:321-326
      '63.   (MIRA 17:10)

LUPANOV, O.B. (Moskva)

Synthesis of certain classes of control systems. Probl. kib.
no.10:63-97 '63.   (MIRA 18:4)

L 6... 65   ENT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)   FF...

ACCESSION NR: AP5017611   UR/2582/65/000/014/0031/0110

AUTHOR: Lupanov, O. B. (Moscow)

TITLE: An approach to the synthesis of control systems - the principle of local coding

SOURCE: Problemy kibernetiki, no. 14, 1965, 31-110

TOPIC TAGS: control system synthesis, local coding, functional element , symmetric function realization, monotonic operator, control theory

ABSTRACT: Almost all the functions of algebraic logic can be realized by circuits which are extremely complicated; consequently, they are for all practical purposes inaccessible. It is therefore very important to separate classes of functions which may be realized by simple means. Following the pioneering work by Shannon, numerous authors have worked on this problem. Most of the existing general results are due to S. V. Yablonskiy (Uspekhi matem. nauk, 12, no. 6, 1957, 189-196; Problemy kibernetiki, no. 2, 1959, 75-121) who established and studied continuous families of classes of functions which are invariant with respect to the substitution of constants and the renaming of arguments. The present comprehensive article (whose results were summarized earlier in DAN SSSR, 140, 2, 1961, 322-325) des-

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L 63374-65

ACCESSION NR: AP5017611

cribes a general approach to the synthesis of schemes - the principle of local coding - which, for a very large number of classes of functions, produces substantially simpler results than those encountered in the general case. In effect, by means of certain recoding, the realization of functions from a given class is reduced to the realization of (arbitrary) functions. The principle is based on the intermediate parameter idea due to A. Sh. Blokh (DAN SSSR. 111, 5, 1956, 1017-1019). The principle of local coding is applied to schemes made of functional elements. Several such examples are found in Chapter I. Chapter II presents several formal sharpenings of the local coding principles and gives the theorem concerning the complexity of the schemes set up by means of the principle. Chapter III utilizes the principle to realize symmetric functions, monotonic operators, and "functions

tional propositions used in the paper. Orig. art. has: 582 formulas, 30 figures, and 7 tables.

ASSOCIATION: None

SUBMITTED: 21Nov63   ENCL: 00   SUB CODE: DP, IE

NO REF SOV: 018   OTHER: 005

Card 2/2

L 32725-66   EWT(d)/T   IJP(c)

ACC NR: AT6010593   SOURCE CODE: UR/2582/65/000/015/0085/0099

AUTHOR: Lupanov, O. B. (Moscow);

ORG: None

TITLE: Realization of symmetric functions in logic algebra by contact circuits

SOURCE: Problemy kibernetiki, no. 15, 1965, 85-99

TOPIC TAGS: algebraic logic, switching theory, periodic function, cybernetics

ABSTRACT: The author uses the procedure of expanding symmetric functions with respect to elementary periodic functions in order to obtain methods for the synthesis of contact circuits and Π-circuits for symmetric functions. By using these functions with respect to a sufficiently large number of variables, much simpler circuits can be set up. A table is given showing the comparative evaluation for the number of contacts for the circuit presented in the given study and for circuits which were set up by earlier methods. The results show that previously studied contact circuits for elementary symmetric functions are not minimal. Orig. art. has: 7 figures, 1 table, and 19 formulas.

SUB CODE: 12 / SUBM DATE: 14Apr64 / ORIG REF: 011 / OTH REF: 002
Card 1/1

LUPANOV, O. V. and YABLONSKIY, S. V.

"On Certain Problems of Theory of Control Systems"

presented at the All-Union Conference on Computational Mathematics and
Computational Techniques, Moscow, 16-28 November 1961

So: Problemy kibernetiki, Issue 5, 1961, 289-294

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LUPANOV, O. V., YABLONSKIY, S. V.

"On Certain Problems in the Theory of Control Systems"

presented at the All-Union Conference on Computational Mathematics and
Computational Techniques, Moscow, 16-28 November 1961

So: Problemy kibernetiki, Issue 5, 1961, pp 289-294

LYAPUNOV, A.A., red.; LUPANOV, O.B., red.; RIKKO, N.N., red.;
MOSKATOV, G.K., red.; IOVLEVA, N.A., tekhn. red.

[Collection of translations on cybernetics]Kiberneticheskii
sbornik; sbornk perevodov. Moskva, Izd-vo inostr. lit-ry.
No.4. 1962. 255 p.   (MIRA 16:4)
                              (Cybernetics)

LUPANOV, P.A., zasluzhennyy deyatel' nauki K-FSSR; CHEPURNOV, V.S., otvet-
stvennyy redaktor.

[Modern atomic theory as a basis for alaborating chemistry courses
in secondary schools] Sovremennaia teoriia atoma kak osnova postro-
eniia kursa khimii v srednei shkole. Petrozavodsk.Izd.Karelo-Fin-
skogo Gos.Univ.1949. 218 p. (Petrozavodsk. Universitet. Trudy Kare-
lo-finskogo gosudarstvennogo universiteta, vol.3)   (MLRA 9:12)
        (Atomic theory)   (Chemistry--Study and teaching)

AUTHORS: Bespalov, N.V., Lupanov, V.S.   SOV-90-58-1C-7/9

TITLE: New Equipment for Dispatcher Communications (Novaya appara-
                tura dispetcherskoy svyazi)

PERIODICAL: Energeticheskiy byulleten', 1958, Nr 10, pp 22 - 25 (USSR)

ABSTRACT: The authors state that the railway selective communications
                system, widely used in the national economy, has some fun-
                damental defects. However, a new type of equipment for dis-
                patcher communications, using voice-frequency ringing, in
                which these defects are absent, has now been developed. Its
                chief characteristic is that audio frequencies are used for
                the transmission of the selective ring; this enables it to
                be switched into lines occupied by high-frequency channels,
                or directly into the channels themselves. Seven call fre-
                quencies are used for the selective ringing: 317, 435, 528,
                780, 1065, 1460, and 2000 cycles. The first six are used
                for individual calls between intermediate points, and the
                last for the group calling of all the intermediate points
                at once. The equipment permits 30 intermediate points (sets)
                being switched in to one circuit (line of communication).
                The control office equipment consists of a desk fitted onto
Card 1/2   the dispatcher's table. The measurements of the desk are

New Equipment for Dispatcher Communications   SOV-90-58-10-7/9

380 x 260 x 248 mm. It houses a call frequency generator
with buttons, and the dispatcher's amplifier with a loudspea-
ker. After a detailed description of the equipment the au-
thors state that it is vastly superior to equipment using se-
lective ringing, as there are hardly any relays requiring
careful sevicing and adjusting. The power supply for the
intermediate points and the amplifiers is, thanks to the
use of semi-conductors, provided by type 3C dry batteries
giving a current of about 5-6 milliamps. The equipment is
not cumbersome, is simply designed and can be quickly set
up. It can also be used under remote control. There are
3 circuit diagrams.

1. Communication systems--Equipment

Card 2/2

LUPANOV, Yu., elektromekhanik

With the help of ship electricians. Mor. flot 23 no.10:31-
33 O '63.   (MIRA 16:10)

1. Teplokhod "Loksa" Estonskogo parokhodstva.
          (Electricity on ships)

LUPANOVA, L.P.; RODIONENKO, G.I.

Gladioli in a Leningrad botanical garden and a plan for describing
a new variety. Trudy Bot. inst. Ser.6 no.4:354-360 '55.(MLRA 9:2)
(Leningrad--Gladiolus)

PROCESSES AND PROPERTIES INDEX

Ca

Basaltic hornblende and augite from monchiquite of the Khibina mountains. N. P. Lapunova. *Trav. inst. petrog. acad. sci. U. R. S. S. 6, 57-64*(1934); *Mineralog. Abstracts 6, 620.*—A dike cutting khibinite in the Khibina tundra is composed of dark monchiquite (I) with phenocrysts of hornblende (II) and idiomorphic augite (III) in a fine-grained or glassy groundmass; II and III form, resp., 43.3 and 13.5% of the rock. Complete analyses of all 3 are given.   C. A. Silberrad

A5A-SL4   METALLURGICAL LITERATURE CLASSIFICATION

LUPANOVA, N. P.

Chemical Abst.
Vol. 48   No. 8
Apr. 25, 1954
Mineralogical and Geological Chemistry

Problem of the origin of gabbro-amphibolites of several regions of the northern Urals. V. P. Morkovkina, and N. P. Lupanova. Izvest. Akad. Nauk S.S.R., Ser. Geol. 1953, No. 4, 46-66.—M. and L. conclude that gabbro-amphibolite and gabbro-peridotitic formation of the eastern slope of the North Urals, and especially their taxitic and lamillar variations, do not appear to be differentiates of gabbro-magmas. Instead they are formed as a result of injection-metasomatic changes of rocks of different compns. and should be designated as mixed amphibolite complexes. Some chem. analyses of the rocks are provided.

Gladys S. Macy

LUPANOVA, N.P.

Paleosoic conglomerates in the Nikitin Ravine (Northern Caucasus, Lesser Laba Valley). Izv. AN SSSR. Ser. geol., 25 no.11:76-93 N '60.   (MIRA 13:11)

1. Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii AN SSSR, Moskva.
            (Laba Valley—Conglomerate)

AFANAS'YEV, G.D.; LUPANOVA, N.P.

Middle Paleozoic alkaline effusives in the Northern Caucasus. Dokl. AN SSSR 140 no.4:889-891 O '61.   (MIRA 14:9)

1. Chlen-korrespondent AN SSSR (for Afanas'yev).
              (Laba Valley--Rocks, Igneous)