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Economic Intelligence Report

HOUSEHOLD APPLIANCES IN THE USSR DURING THE SEVEN YEAR PLAN 1959–65

CIA/RR ER 62–2

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CENTRAL INTELLIGENCE AGENCY

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FOREWORD

This report is concerned with Soviet production of refrigerators, washing machines, sewing machines, and vacuum cleaners -- the only large household appliances now being produced in significant quantities in the USSR. Electrical cooking appliances in the USSR usually are hot plates rather than regular cooking ranges, and such items as freezers, clothes dryers, and air conditioners are almost unknown in Soviet households. Consumers in the USSR have been promised a large increase in the availability of electrical appliances. This report discusses the current availability of household appliances in the USSR, the plans for increasing their production, and the feasibility of the plans.

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Illustrations

HOUSEHOLD APPLIANCES IN THE USSR DURING THE SEVEN YEAR PLAN* 1959-65

Summary and Conclusions

The only large household appliances produced in significant quantities in the USSR are refrigerators, washing machines, sewing machines, and vacuum cleaners.** Production of these items since 1955 and the planned goals for 1961 and 1965 are shown in the accompanying chart, Figure 1.

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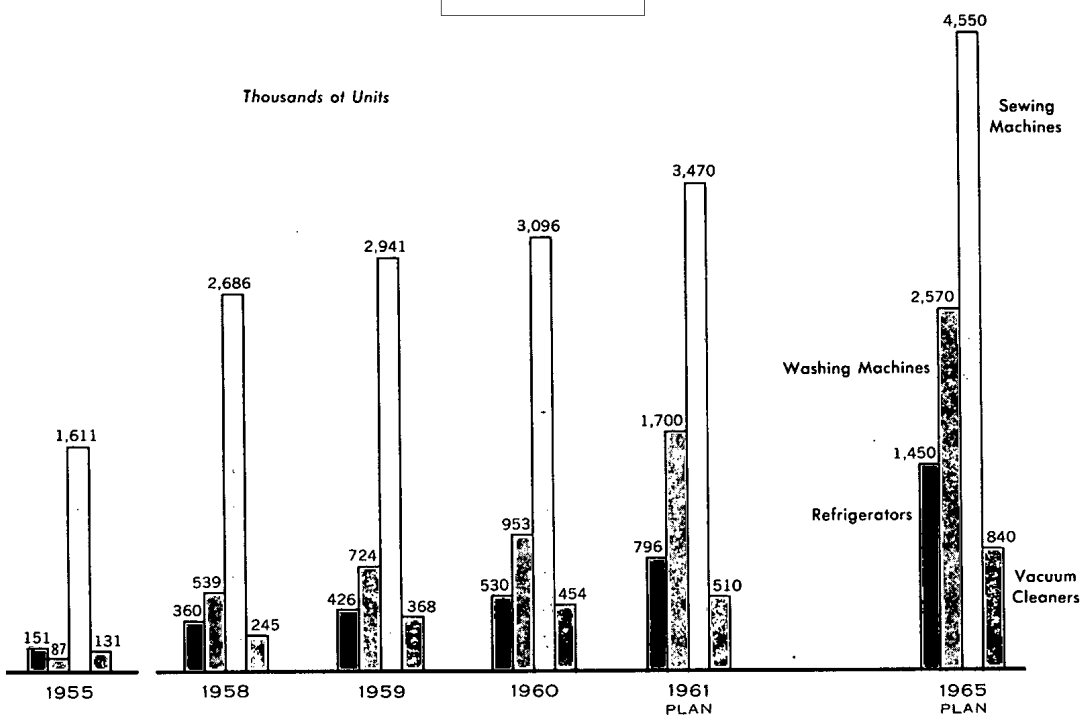

Figure 1. USSR: Production of Household Appliances, 1955, 1958-60, and 1961 and 1965 Plans

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* The estimates and conclusions in this report represent the best judgment of this Office as of 1 January 1962.

** Unless otherwise indicated, the term appliances as used in this report includes refrigerators, washing machines, sewing machines, and vacuum cleaners that are designed for household use.

Production of sewing machines was underway in the USSR before World War II, but development of other household appliances has been largely a postwar phenomenon. In line with the recent policy of granting more concessions to Soviet consumers, the Seven Year Plan (1959-65) called for large-scale production of appliances by 1965. In 1959, after the visits of Mikoyan and Khrushchev to the US, a Consumer Goods Decree was issued that raised the goals for 1961 for production of appliances and implied considerably higher rates of increase than those implicit in the original goals of the Seven Year Plan.

How this accelerated program ultimately will affect the goals for 1965 is not clear, but the higher rates of increase have not yet been achieved completely, and it is unlikely that they could be maintained during the entire 7-year period. The original goals for 1965, however, have not been revised and probably will be fulfilled. At this projected level of production, Soviet officials estimate that the availability of appliances to households in 1965 will be as follows: refrigerators, one to every five urban households; washing machines, one to every three urban households; and sewing machines, one to every two households, both urban and rural. Few rural families now have appliances except sewing machines, but the expansion of electric power is opening the prospect of household appliances in rural areas.

Although consumers in the USSR are anxious to own appliances, they are often dissatisfied when they finally obtain them. Few of these appliances would be salable in retail markets in the US. They are poorly designed, crudely built, and subject to breakdowns. Soviet refrigerators have a small amount of usable space in relation to their size and weight. The washing machines seldom have automatic devices that require timing mechanisms, many have roller wringers that are operated by hand, and only 10 percent of those now being produced incorporate centrifugal wringing devices. Soviet vacuum cleaners are heavy, bulky, and noisy, and the electric sewing machines have been so unreliable that many housewives are returning to treadle machines. Even in the urban areas the usefulness of these appliances is limited by the undependable nature of the Soviet supplies of electric power, the flow of current being erratic and the voltage uneven.

Both the availability and quality of Soviet appliances have been influenced adversely by the preoccupation of planners with heavy industry and the general neglect of the consumer goods industries. As such, there are no appliance industries charged with the design, development, and production of household appliances. Instead, production has been relegated to subsidiary shops of plants that specialize in other types of machinery. Because of its low priority, such production has not been allocated the engineering talent and the capital necessary for efficient

operation. Production is unorganized, there is little coordination among producers, and inadequate specialization has led to high costs. Until these deficiencies are rectified, Soviet consumers will find that household appliances are scarce, expensive, and of poor quality.

I. Introduction

Shortages of consumer goods in general and the scarcity of household appliances in particular are a legacy of the Soviet preoccupation over the years with building heavy industry and expanding scientific frontiers. Except for sewing machines, scarcely any household appliances were produced in the USSR before World War II, and the only large appliances developed and produced since the war are refrigerators, washing machines, and vacuum cleaners. Soviet planners have not seen fit to establish an appliance industry in the Western sense but have relegated such production to the part of industry that comes closest to having the engineering skills and capital equipment needed to handle the task -- the machine building industry. Even then, this industry has not been provided with the able designers, the specialized equipment, and the materials needed to support first-rate production of appliances. Thus production of appliances has developed as a sideline in subsidiary shops of automobile, electrical machinery, and other machine building plants. For designs and engineering technology, manufacturing plants have been forced to depend on technical publications from the West and outright copying of Western models of appliances.

In view of the current pressures to expand production of household appliances, Soviet officials deplore the lack of specialization that exists throughout much of this area of production. Not a single plant exists in the USSR that specializes, for example, in the manufacture of refrigerators, and a similar lack of specialization of production is typical for most of the other appliances except sewing machines.

II. Goals

A. Seven Year Plan (1959-65)

By the end of the 7-year period 1959-65, sales of appliances are scheduled to be substantially above the level achieved in the preceding 7 years (1952-58). Sales of refrigerators are to be six times as great; sales of washing machines, nine times; and sales of sewing machines, two times. If these goals are achieved, the total stocks of these appliances will have reached sizable proportions. According to Soviet estimates, 1/* more than 7.6 million refrigerators, 12.3 million washing machines, and 40 million sewing machines will be available by 1965. Soviet officials claim that in 1965 there will be one refrigerator for every five urban households, one washing machine for every three urban households, and one sewing machine for every two households,

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both urban and rural. Although this inventory compares unfavorably with present US inventories,* it approaches the current level of availability of these appliances in the UK and some of the other European countries.** 3/

B. Consumer Goods Decree of 1959

Following Mikoyan's visit to the US in January 1959 and Khrushchev's visit in the summer, a decree was issued in October calling for improvements in the quantity, quality, and variety of a wide range of household goods including electrical appliances. This sequence of events suggests that the Soviet leaders were seriously concerned about the lagging production of consumer goods in the USSR. Targets for 1961, spelled out by the decree, showed that production of appliances was being stepped up sharply.*** Although no increases in goals for 1965 were announced, the annual increases needed to achieve the new goals for 1961 were considerably higher than those required to fulfill the Seven Year Plan. The following tabulation shows the average annual increases required by the Seven Year Plan and those required by the Consumer Goods Decree (based on new goals for 1961):

	Average Annual Rate (Percent)	
	Seven Year Plan (1959-65)	Consumer Goods Decree (1959-61)
Refrigerators	22	30
Washing machines	25	31†
Sewing machines	7.8	8.9
Vacuum cleaners	19	28

* Soviet planners point out that it is not desirable that Soviet industry compete with the US in production of electrical appliances for consumer use. 2/ Although officials are reluctant to admit it, Soviet industry cannot really compete in this area (1) because the restricted living space prohibits the use of appliances in such size and number as are used in the US and (2) because the government officials want to deemphasize individual ownership of goods in the Communist way of life.

** Production goals for the Seven Year Plan for household appliances are discussed in III, A, p. 9, below.

*** See the tabulation in III, A, p. 9, below.

† A subsequent revision increased the goal for 1961 for washing machines.

How the accelerated program for appliances ultimately will affect the goals for 1965 is not clear. Developments thus far suggest that upward revisions of the goals for appliances may be expected in 1962 or 1963, but Soviet officials may decide to leave the goals of the Seven Year Plan unchanged in order to announce fulfillment of plans early in 1964. If the higher rates of increase could be maintained throughout the 7-year period, the goals for 1965 would be exceeded by far, but such performance is unlikely. Plans for production of refrigerators and washing machines were reported underfulfilled in 1960, more than a year after the decree, and although official reports indicate that major increases had been achieved, they also admit that production of refrigerators and washing machines was still lagging in mid-1961.

C. Establishing an Appliance Industry

Up to the present time, Soviet production of household appliances has lacked efficient organization and administration. Soviet machine building plants continue to operate subsidiary shops for producing appliances, and these shops are relatively isolated from other enterprises producing appliances. There is no planned and coordinated program of development. Small plants operate at high costs, and gross inefficiency and waste result from crude or inefficient production techniques and from inadequate specialization of processes. Inputs of materials and labor admittedly are excessive, and finished products often are poorly constructed and perform badly. In an effort to overcome these weaknesses, planning officials stress the need for building large specialized appliance plants in major industrial centers, particularly for production of refrigerators and washing machines. 4/ The officials also propose that "material encouragement" be given to designers to stimulate the creation of new household appliances which are suitable for mass production and which promise to be acceptable to consumers. The names of designers soon may be attached to outstanding contributions, adding the incentive of personal prestige to that of material reward.

Other measures are aimed at improving the organization of production. At the beginning of the Seven Year Plan, certain committees attached to the Council of Ministers* were charged with the tasks of (1) creating new designs for appliances suited to mass production, (2) coordinating the work of the designing and producing enterprises, and (3) giving technical aid and assistance to the producers. Such work would be carried out at research institutes under the direction of these committees. By mid-1961, however, it was reported that not a

* These committees included the State Committee on Automation and Machine Building, the State Committee on Electronic Technology, and the State Committee on Defense Technology.

single institute had yet been organized for these types of research and coordination. 5/

Except in production of sewing machines, plants producing household appliances do not specialize in production of a single type of appliance or even in the general field of household appliances. Specialization is evident only in sewing machine plants, where the number of producing plants is small and the size of their production relatively large. Production of household sewing machines makes up the total production of these plants except at the Podol'sk Machinery Plant, where industrial sewing machines are produced as well.

There are many plants, such as the Riga Electrical Machine Building Plant and the Batumi Electrical Engineering Plant, which are engaged primarily in production of other kinds of machinery but produce appliances as well. The few plants that do specialize in production of washing machines produce in such small quantities that they are less efficient than the major producers mentioned above. No single plant is devoted exclusively to production of refrigerators. The leading Soviet producer of refrigerators is the Moscow Motor Vehicle Plant, and other producers of refrigerators also are engaged primarily in building other machinery or industrial goods. Production of vacuum cleaners is scattered throughout various Soviet plants that produce other electrical equipment.

III. Growth of Output and Supply

A. Production

The Seven Year Plan calls for rapid growth in output of major household appliances. From fairly low bases of production in 1958,* production should continue to increase rapidly throughout the 7-year period, in spite of some underfulfillment, as indicated by growth since 1958 and by the production goals. The following tabulation shows production since 1955 and planned goals for household appliances**:

* Except for sewing machines, which have been produced since the early 1900's.

** For detailed information on the various types and models of Soviet household appliances, see Appendix A, p. 15, below.

	Thousand Units					
	1955	1958	1959	1960	1961 Plan	1965 Plan
Refrigerators	151	360	426	530	796	1,450
Washing machines*	87	539	724	953	1,700**	2,570
Sewing machines	1,611	2,686	2,941	3,096	3,470	4,550
Vacuum cleaners	131	245	368	454	510	840

The effects of the planned acceleration in production have been spotty thus far. At mid-year, fulfillment of the goals for 1961 appeared doubtful. Plants producing refrigerators and sewing machines, for example, were failing, as of mid-1961, to achieve the annual rates of growth required to meet the goals for 1961, even though substantial increases had been achieved. For washing machines the rate of growth required by the 1961 plan had been achieved, but production still was reported underfulfilled. This development indicated a still further increase in goals for washing machines, which in fact has been mentioned but is not widely publicized. 6/ By the third quarter, reports indicated that production of washing machines was increasing more rapidly, but the outlook for fulfillment was still doubtful because of the increased goals. No reports were given for sewing machines and vacuum cleaners.

If the production goals for household appliances are reached by 1965, four times as many refrigerators will be produced as were built in 1958, almost five times as many washing machines, and more than three times as many vacuum cleaners. These increases are indicated in Figure 1.*** Increases in production of sewing machines will be relatively less because of the larger volume of production in 1958. Indexes of production, based on achievements since 1958 and goals for 1961 and 1965, are as follows:

	1958 = 100				
	1958	1959	1960	1961 Plan	1965 Plan
Refrigerators	100	118	147	221	403
Washing machines	100	134	177	315	477
Sewing machines	100	109	115	129	169
Vacuum cleaners	100	150	185	208	343

* The category of washing machines includes, in addition to clothes washers, (1) dishwashers in small numbers and (2) "washing instruments" (electrical hand appliances of the vibrating type, costing half the price of a washing machine).

** The plan as stated in the 1959 decree was 1,215,000 washing machines, but this goal was revised upward.

*** P. 1, above.

B. Use Pattern

1. Over-All Distribution

Demand for electrical appliances is growing rapidly in the USSR as new housing becomes available and as the purchasing power of the population increases. Distribution of the increasing supplies of appliances thus becomes a matter for official planning. The Soviet pattern for distribution of household appliances, for both present and future use, is based on a three-way approach to supplying the needs of the population: (1) private ownership, (2) communal use, and (3) service on a rental basis.

The number of appliances that can be owned outright is limited first of all by the living space available per family unit. Even where the dwelling space is a new single family apartment (more often, apartments have common kitchen and bathroom facilities), the area allotted per family is often too small to accommodate appliances. Recognizing this inconsistency in planning, officials now ask that appliances be reduced in size and weight. Refrigerators are in greatest demand for private ownership, and families often wait several years for delivery on their orders.* Washing machines, although sometimes privately owned, are more often set up for communal use. Plans call for the expansion of "the network of communal laundries," which can accommodate numbers of families, thus solving some of the problems of limited space and inadequate plumbing. By Soviet experience, one washing machine can serve as many as 25 to 35 families.

In order to reduce the demand for privately owned machines and appliances, rental services for a wide range of household goods have been provided in a number of cities. Such items as vacuum cleaners, floor polishers, sewing machines, washing machines, and a wide range of smaller items for household use are available for rent at a small cost. These rental services are scheduled to be expanded during the 7-year period.

In spite of the widespread demand for household appliances, which will considerably exceed supply in the foreseeable future, consumers often are displeased with the product that they have waited so long to own. Consumer acceptance thus becomes another factor to be dealt with in planning but one that has received little real attention. So far, annual sales of household appliances are about equal to production, after adjustments are made for foreign trade balances. Foreign

* To limit the demand in the future for kitchen equipment, the plan is to provide food preparation centers for carry-home meals and a wide range of packaged prepared foods for sale in retail stores.

trade in these appliances is not significant except for a small import of sewing machines and parts. In the future, however, rejection by consumers of appliances that do not meet their requirements (as is the case with electric sewing machines)* could result in an accumulation of stocks of unwanted goods in retail trade channels. Continuing pressure by the planning organizations to increase the annual output of appliances at the expense of improved quality and design and at the neglect of consumer desires and needs may result in a situation -- not unique in Soviet retailing experience -- where consumer rejection and oversupply persist concurrently, even when the demand for these commodities is high.

2. Restrictions Imposed by the Supply of Electric Power

The use of household appliances is restricted to some extent by the supply of electric power. Even where electricity is available there are problems of erratic flow of current and fluctuations in voltage that result in part from inadequate wiring and improper distribution of current. Gosplan officials are concerned about consumer demands on the supply of electricity and particularly about the waste of electricity through use of household appliances. Officials complain: "Much electricity is consumed unjustifiably as the result of the instability of electric systems ... . The people are forced to buy voltage stabilizers and transformers [the use of which] ... causes the deterioration of the operation of electric networks." More than 800,000 such devices were bought during 1959 alone. 7/

The capacity of apartment lead-ins is inadequate to support large numbers of household appliances, in particular those with heating elements. In the large-scale construction of housing, there has been a notable lack of planning for adequate wiring -- in the Soviet view, a "failure to take into consideration the possibilities for the electrification of daily living." 8/ Inadequate electric power will continue to restrict the use of household appliances by individual families in the years to come.

3. Urban-Rural Differences

Most of the household appliances produced by Soviet industry are used by the urban population. Except for sewing machines, which are divided about equally between urban and rural families, few durables have been available outside the cities. Allocations of goods to rural trading organizations have included almost no household appliances except sewing machines, although it is expected that rural retail outlets will offer refrigerators, washing machines, and other appliances

* See Appendix A, 3, p. 20, below.

for sale before the end of the 7-year period and that installment buying, now possible only in urban stores, will be extended to rural shoppers.

The use of appliances also will be restricted by the lack of electric power in some rural areas and by the need for modernizing rural housing. Khrushchev has emphasized the need to construct "city-type houses" in the country with running water, central heating, and sewer systems "in order to free the peasants from daily cares." Khrushchev also has promised that consumption of electric power "in the countryside" during the 7-year period will be three times that consumed during 1952-58, 9/ an estimate that probably takes into account electric power for operating increasing numbers of household appliances. The vast difference between living conditions in rural and urban areas is recognized officially, and planned equalization of urban-rural living levels is to be effected in part by making available more electrical household equipment.

4. Problems of Servicing and Repair

Severe problems of servicing and repair of appliances in the USSR arise first of all from the faulty production of appliances themselves and secondly from the paucity of repair facilities. The number of defective household appliances entering the trade channels is excessively high, primarily because of inadequate quality control at the producing plants. In Moscow, for example, 16,000 Saratov refrigerators were delivered to customers in 1960, and 13,000 calls for services were registered at repair shops for these appliances. But in other cities, there are often no repair facilities at all for appliances, and reportedly the "output of spare parts necessary for repair ... is badly organized at present."

The owner of a new appliance knows that a factory guarantee for 6 months means only that a repair shop is obliged to rectify manufacturing defects for that period of time. Because the guarantee is honored at a repair shop and not at the factory itself, the producing plant is relieved of the responsibility for servicing the goods that it produces. Although plants may have some financial responsibility for such repair, plant managers do not seem to have the motivation to foster needed improvements in quality control but rather are content with production of inferior goods as long as quantity goals are reached.

IV. Feasibility of Goals

The Soviet goals for 1965 for production of household appliances are feasible and, indeed, may be exceeded unless they are revised

upward. These goals, however, were set before Khrushchev's intensified interest in production of consumer goods came about and were therefore commensurate with performance in production of appliances in the years before 1959. Production rates called for by the plan -- for example, annual increases of 22 and 25 percent, respectively, for refrigerators and washing machines -- were not high considering the relatively small bases of production at the beginning of the 7-year period. These goals probably could have been met with the investment of a fairly small amount of capital if existing production facilities were expanded and production techniques in general were improved.

Under the accelerated program in the Consumer Goods Decree of 1959, the goals for 1961 require increases much higher than those scheduled for the Seven Year Plan and probably will not be met for most of the appliances. The stepped-up program has resulted in some substantial increases in production using present facilities, but these increases will be short of the goal and probably cannot be maintained up to 1965.

Repeated underfulfillment of plans for refrigerators and washing machines in 1959, in 1960, and through mid-1961 clearly shows that the targets for those appliances will not be reached. The goals for 1961 for refrigerators and washing machines require annual increases of 30 percent or more; smaller increases are required for sewing machines and vacuum cleaners. The goals for washing machines were raised still again in 1961 after good performance was achieved in 1959 and 1960. Production called for in 1961 is, in fact, 1.8 times production in 1960, and underfulfillment of the goal will be due to the late revision and not due to the lack of over-all progress. In view of these developments it appears that there may be a deliberate policy of exerting pressure on producing plants by raising goals and reporting underfulfillment of production.

If the higher rates of increase of the Decree of 1959 are to be maintained throughout the 7-year period, more extensive effort will be required to increase the capacity for production, and greater investment of capital will be required to meet the programs of new construction and modernization. No mention has been made of providing such funds. Plants will need to move more rapidly toward specialization of production, but there has been little evidence of efforts directed toward specialization. A research and development program must be organized, and closer coordination must be promoted between plants producing appliances, but there has been little progress in these directions. Planning and production officials openly recognize these requirements for achieving the desired increases, but measures taken so far have been inadequate to assure meeting the goals of the accelerated program.

APPENDIX A

DESIGN AND PRODUCTION CHARACTERISTICS OF HOUSEHOLD APPLIANCES IN THE USSR

1. Refrigerators

a. Production

Series production of household refrigerators began in the USSR in 1951 in various plants of the machine building industry. Soviet engineers have claimed "unprecedented progress" in household refrigerators, but the Soviet refrigerator is in no way a product of original Soviet effort or creative engineering skill. It is patterned after early Western models in both cabinet design and cooling system. Even now, with a total production of more than half a million units a year, the USSR still has no facilities for the design and development of household refrigerators.*

Soviet household refrigerators are produced in shops located at 19 different plants of the machine building industry, and several additional plants are scheduled to begin production soon. The Motor Vehicle Plant imeni Likhachev (Zavod imeni Likhacheva -- ZIL) in Moscow is the largest single producer of refrigerators and is responsible for almost one-fourth of the total production. Other large producers are the Saratov Machine Building Plant in the Lower Volga Region and the Dnepropetrovsk Machine Building Plant No. 192 in the Ukraine. Plants in the Ukraine produce about 25 percent of the total production. Further information on individual plants producing refrigerators is given in Appendix B.**

* To evaluate the net advantage to the USSR of Western engineering experience in home refrigerators, it is helpful to review major steps in the Western development and research. Refrigeration engineering has evolved over a period of some 40 years through research efforts carried on largely in the US. For example, in 1926 the original wood refrigerator cabinet was replaced by a metal cabinet. The following year the first exterior finish of porcelain-on-steel was introduced. In 1929 the temperature-control mechanism with defrosting was provided. Hydrators came in 1930; the sealed compressor and new refrigerant, Freon (still in general use), was developed in 1931. Automatic defrosting was introduced in 1952, and the frost-free system and foam insulation were introduced in 1958.

** P. 23, below.

The Consumer Goods Decree of 1959 directs the industry to design and produce "the most economical compression and absorption refrigerators, including small and built-in models, making the most efficient use of refrigerator space, ... reducing metal inputs and power consumption, and making more use of plastics and new insulating materials ... ." 10/ The planners thus indicate some of the outstanding deficiencies of Soviet refrigerators and point out the need for modernizing production processes through increased specialization and improved organization.

Advanced production techniques typical of Western practice are not in evidence in Soviet production of refrigerators. In the use of materials and the methods of construction, Soviet techniques in many ways resemble Western practices of 30 or 40 years ago. Often, expensive materials are used, raising the costs of production needlessly. Evaporators (freezing compartments) in some models are of stainless steel, whereas aluminum is lighter, more economical, and more than adequate. Condensors sometimes are of copper tubing instead of steel, which is less expensive and equally reliable. Compressors are constructed of castings that are heavier than needed and make the refrigerator unnecessarily heavy in relation to its capacity.

In order to achieve a high volume of production at a lower cost, certain production techniques are needed in the Soviet processes. The electrostatic process for applying enamels, for example, and the vacuum-forming of plastic for interior door panels are techniques yet to be introduced into the production processes. Smaller thermostatic devices are needed, as are improvements in insulation materials. Glass fiber and foam insulation are poor in quality and inadequate in supply.

b. Description

The first refrigerators produced during the early 1950's were crudely built, highly simplified models of questionable reliability. Even now, Soviet refrigerators resemble those produced by Western industry during the 1930's. They tend to resemble European rather than American prototypes and are designed first of all to conform to restrictions of living space. In the USSR, as in Western Europe, refrigerators are smaller than in the US, reflecting the habit of daily shopping for food. In the more advanced European countries the average refrigerator has a capacity of 5 cubic feet. 11/

Changes in the design of refrigerators during the 10 years of production have not been extensive. Nevertheless, the well-known models of household refrigerators have undergone partial modernization, directed basically toward lowering the cost of production -- that is,

more economical metals and plastics, simpler motors, redesigned parts, and the like have been introduced. These changes, however, have resulted in little change in the general design and appearance of the refrigerators, which, except in a few models introduced in 1960 and 1961, continued to be essentially the same appliances that they were almost 10 years before -- heavy, bulky, and with small storage capacity relative to their dimensions. The size of refrigerators has tended to increase somewhat (capacities range from 2 to 8 cubic feet), and a few new features such as interior lights and door shelves have been introduced.

Most of the Soviet refrigerators have cooling systems of the compressor type, but refrigerators of the absorption type also are produced.* Although absorption refrigerators are economical to produce and operate because of their simpler mechanism, they are less effective in hot weather and generally are not in great demand. The compressor refrigerator is more expensive to produce but is effective in all climates and has proved to be more popular. Models of Soviet refrigerators in production during the 1950's are shown in Figure 2,** and some of the models introduced in 1961 and 1962 are shown in Figure 3.**

c. Outlook for the Future

The immediate goal of Soviet officials is to increase output of refrigerators so that almost a million and a half will be produced annually by 1965. The number of designs and models will be limited, and standardization of parts will be stressed. Specialized sales and service facilities also are planned. Refrigerators of both compressor and absorption types will be produced, but compressor types probably will continue to predominate by about four to one.

Soviet engineers have proposed a few new ideas that may eventually be worked into the plans for home refrigeration. For example, a unit combining a gas-operated refrigerator and cooking range (now produced in small lots) could prove to be an acceptable appliance for the crowded urban kitchen. 12/ The idea of "centralized cold" has been proposed -- a system in which a central compressor would pipe

* The compressor type of refrigerator uses a cooling system in which the refrigerant, usually Freon (a US trade name for a group of fluorinated hydrocarbons), is circulated by means of a compressor. In the absorption type of refrigerator the refrigerant, ammonia, is circulated by the simple application of heat, either gas or electric. This system is free from moving parts and is almost noiseless.

** Following p. 18.

cold air to built-in boxes in each kitchen. Such systems would be planned and installed during construction of apartment buildings where savings could be realized in electricity and inputs of materials, especially compressors required for building an equivalent number of single-unit refrigerators.

Another proposed innovation is the casting of a one-piece refrigerator box of microporous plastic that would integrate the outer surface, the liner, and insulating materials into a single casting. Molded doors of plastic would complete the unit. Soviet engineers anticipate that these refrigerators would have the advantages of lighter weight, lower thermal conductivity, and a lower consumption of electric power.

2. Washing Machines

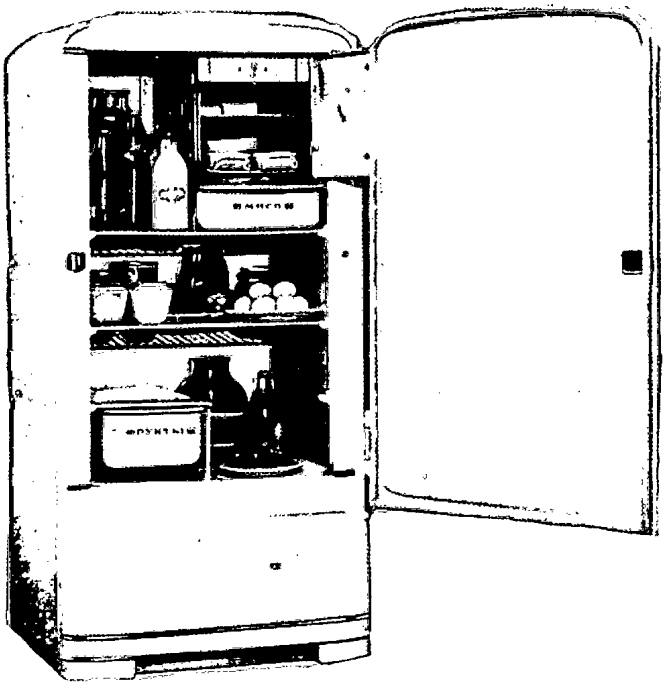
a. Production

Production of washing machines in the USSR rose from about 1,000 units in 1950 to nearly 1 million in 1960, an increase in production of which Soviet management is proud. Few improvements in design or quality have been made during 10 years of production. These appliances are hardly comparable to models produced in Western countries and generally would not be salable in Western markets. Most of the machines currently produced are wringer washers; many of the earlier models had no equipment for wringing. A separately built centrifugal wringer, for which there is no counterpart in the West, is being produced for use with these early models. Only 10 percent of the total production is classed as semiautomatic washers -- that is, washers equipped with centrifugal wringing devices, timers, and pumps.

More plants are engaged in production of washing machines than in any of the other household appliances (for a listing of major producers, see Appendix B*). In 1960, as many as 45 plants reportedly were producing washing machines, but fewer than half of these could be called major producers in a class with, for example, the Riga Electrical Machine Building Plant and the Batumi Electrical Engineering Plant. Many of the plants are small producers that build fewer than 10,000 machines annually and are characterized by obsolete production techniques, low rates of output, poor quality of product, and production costs that often exceed the price on the retail market. 13/

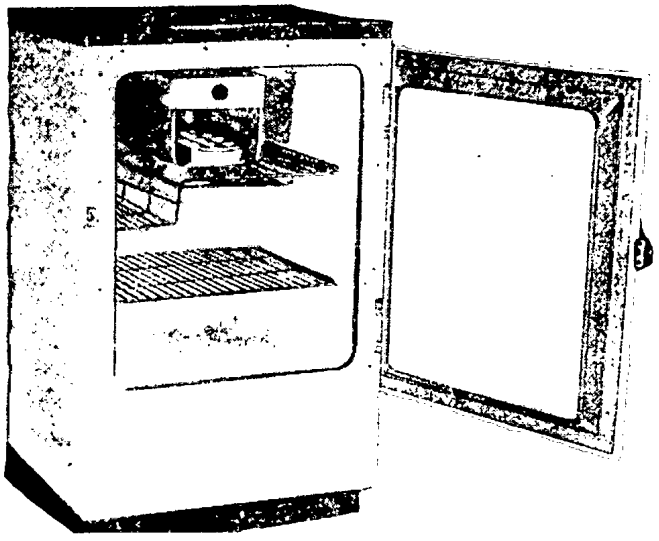
Soviet officials are under pressure to improve the productive capacity for washing machines through reorganization, consolidation, and specialization. The goal is high-volume production on a more

* P. 23, below.

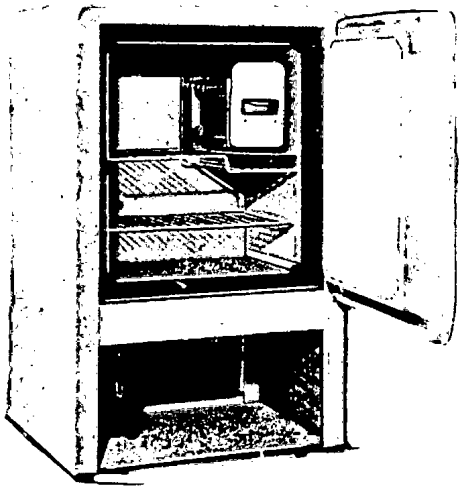


ZIL MOSKVA: Compressor Refrigerator;
Capacity, 5.8 Cubic Feet

Sever 2. Absorption Refrigerator Powered by
Electricity; Capacity 1.6 Cubic Feet



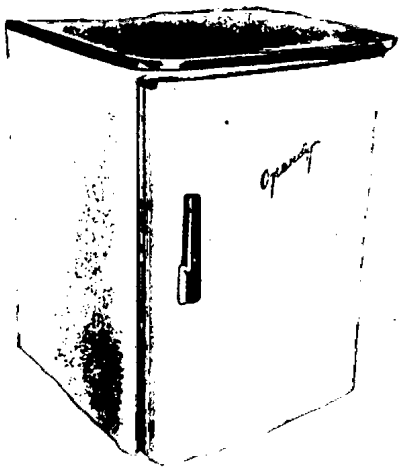
Saratov 2: Compressor Refrigerator;
Capacity, 3 Cubic Feet



Ukraine 2: Absorption Refrigerator Powered by Gas;
Capacity, 2.5 Cubic Feet

FIGURE 2. MODELS OF REFRIGERATORS PRODUCED IN THE USSR, 1950-60

ZIL MOSKVA KKh 240: Compressor Refrigerator; Capacity, 8.5 Cubic Feet



Orenburg: Table top Absorption Refrigerator Powered by Electricity; Capacity, 2.4 Cubic Feet

Saratov 3: Compressor Refrigerator; Capacity, 6.2 Cubic Feet

FIGURE 3. MODELS OF REFRIGERATORS INTRODUCED IN THE USSR, 1960-61

profitable basis, but progress in this direction appears slow. The lack of coordination in the development and application of efficient production methods has resulted in experimentation by individual plants and widespread disagreement as to methods of production and efficient use of materials. Some machines consequently are "overbuilt" and excessively heavy, whereas others are light, cheaply built, and less durable. Availability sometimes dictates the choice of materials or components as in the use of a motor, heavier than needed (or lighter than needed), for the workload of a given washing machine.

On the whole, the producing plants continue to wrestle with problems of how to produce a simple, cheap, agitator washer, while at the same time planners note that "in the US, with growth of the output of automatic machines, the output of nonautomatic machines dropped off." 14/ Even though Soviet consumers, too, desire a better product, planners continue to direct the industry primarily toward turning out a large number of units and secondarily toward improving their design. Producers, nevertheless, also are urged to increase production of machines "with centrifugal wringing devices, while insuring smaller dimensions, lighter weight, ... and increased efficiency of motors." 15/

b. Description

Early models of Soviet washing machines were simple, round tubs with agitator washing action and washing capacities of 4 to 6 pounds of dry laundry.* Most of the washing machines produced are still of this general type with the addition of hand wringers and in some cases pumps for emptying the tubs (see Figure 4**). Some producers make tubs of stainless steel at excessive cost, whereas other producers use aluminum or enameled iron. Plastics have been used experimentally for construction of washing tubs in an attempt to lower the cost of production.

Motor-driven roller wringers, so long in use in washing machines in the West, seldom appear on Soviet washing machines. Instead, hand-operated wringers, which are still in general use, are to be replaced in more advanced models by motor-driven centrifugal spinners. In Soviet experience, "It has been demonstrated that ... wringing clothes centrifugally (by means of a perforated metal cylinder rotating at rapid speed) operates many times better and faster than rubber rollers ... ." 16/

The more advanced models of Soviet washers are referred to by producers as semiautomatic. The machine is enclosed in a square or

* Wringer washers in the US usually can accommodate 9 to 12 pounds of dry laundry, and automatic machines 8 to 10 pounds.
** Following p. 20.

rectangular cabinet, modern in exterior design, and consists of a tub (square or L-shaped) with a plastic or metal agitator and a centrifugal spinner basket (see Figure 5*). A simple timing device and an automatic pump for emptying the water are included. The fully automatic washing machines common in the US are not produced in the USSR.

3. Household Sewing Machines

Household sewing machines have been produced in the USSR on a fairly large scale since the beginning of the twentieth century. One of the oldest and still by far the largest Soviet producer is the Podol'sk Machinery Plant imeni Kalinin. This plant was built by an American company, the Singer Manufacturing Company, in 1901 and operated by that company until 1918, when it was confiscated by the new Soviet government in its program of nationalizing Russian industry. The USSR now produces more than 3 million sewing machines annually, of which the Podol'sk plant accounts for more than 80 percent. Four other plants, located at Rzhev, Khar'kov, Orsha, and Tula (see Appendix B**), are small producers by comparison but are scheduled for considerable expansion by 1965.

The simple straight-stitch sewing machine operated by a treadle (see Figure 6*) makes up the largest share of machines produced, although more modern and more complicated electric models in both portable and cabinet designs are in limited production. The machine most advanced in design is the Tula Model 6 (see Figure 7*), which has a zigzag stitching mechanism capable of performing 12 sewing operations.*** By comparison with the versatile zigzag machines produced in Western Europe, Japan, and the US, the Tula is not an elaborate sewing machine.

To the great dismay of Soviet production and marketing officials, the demand for electric sewing machines is dropping off sharply, and housewives are returning to the old-fashioned treadle machines. Officials investigating the problem attribute this dissatisfaction with electric sewing machines to their unreliable performance, which in turn stems from faulty construction of the electrical systems and the instability of electric current. The lack of control of the operating speed and the uneven starting and stopping are particularly common complaints by housewives. Furthermore, untrained users find that they are not furnished with the technical information and instruction required for effective operation of the new types of electric machines and the even more complex zigzag machines.

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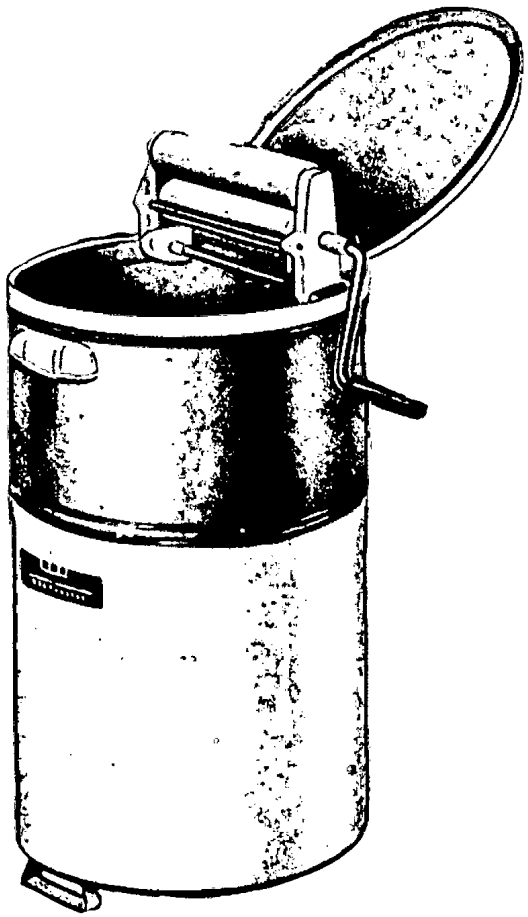
* Following p. 20.

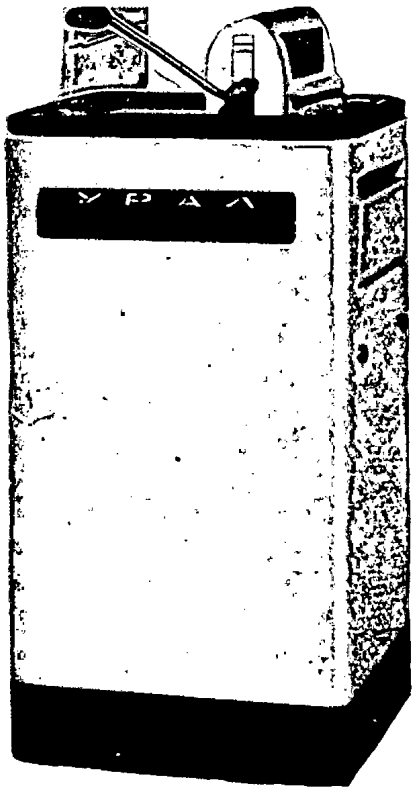
** P. 23, below.

*** In addition to straight sewing, this machine is said to perform such operations as embroidering, darning, "whip-stitching," sewing on buttons and hooks, and making button holes.

Riga: Various Models of Washing Machines and a Spin Dry Type of Wringer

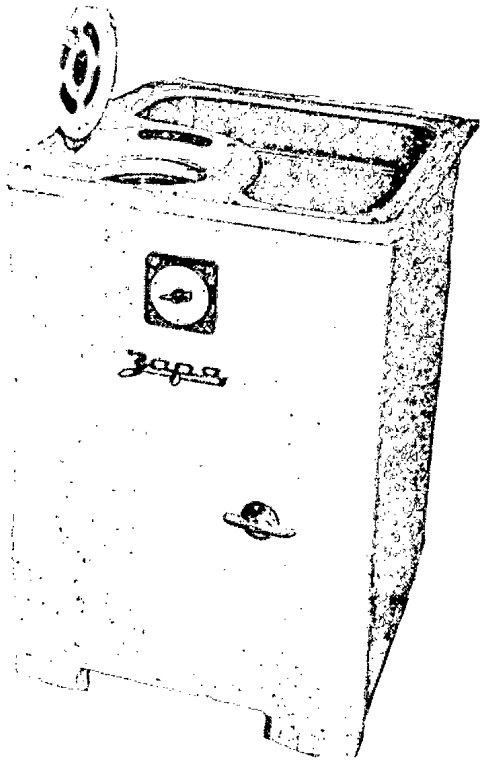


Batumi 59: Wringer Washer Similar to the Late Model Riga

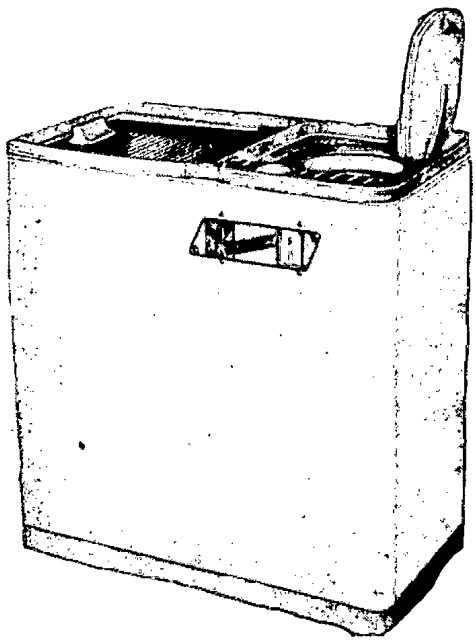


Ural: A Wringer Washer of Modern Design. The Hand Wringer Folds Inside When the Machine is not in Use.

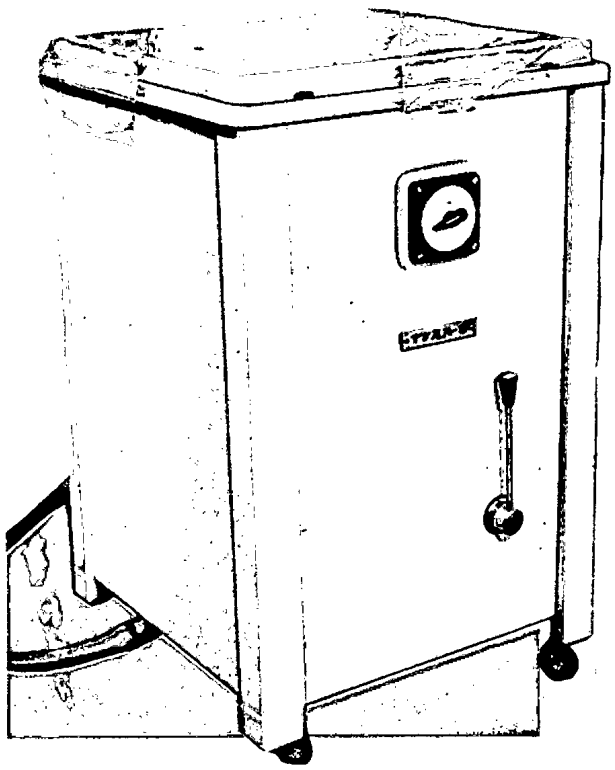
FIGURE 4. WASHING MACHINES OF THE WRINGER TYPE PRODUCED IN THE USSR, 1950-61. THE WASHING CAPACITY OF THESE MACHINES IS ABOUT 5 POUNDS OF DRY CLOTHES.



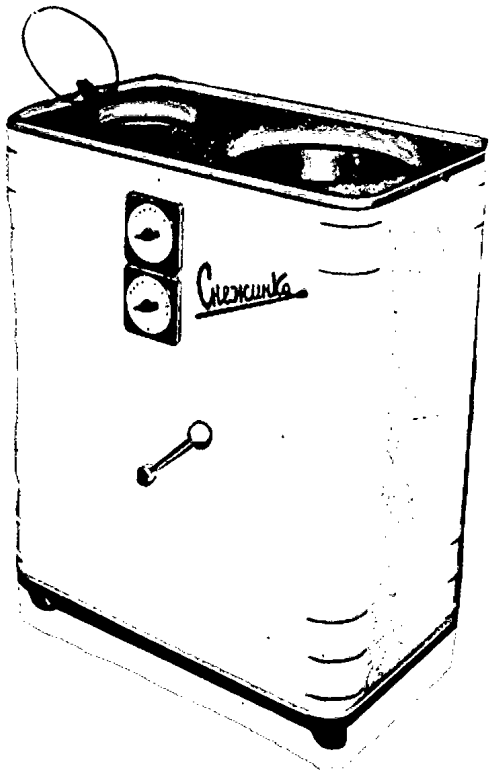
Zarya



Sibir'-3

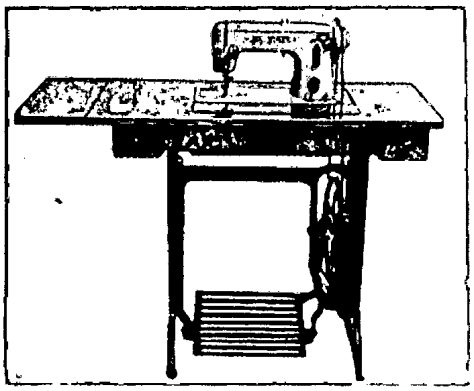


Tula 60

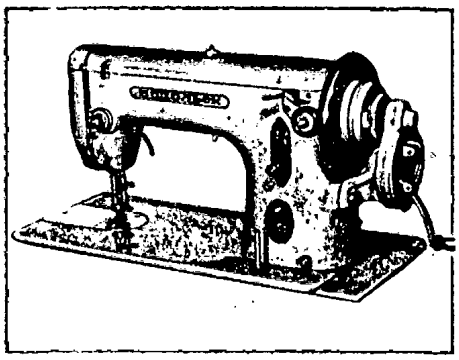


Snezhinka

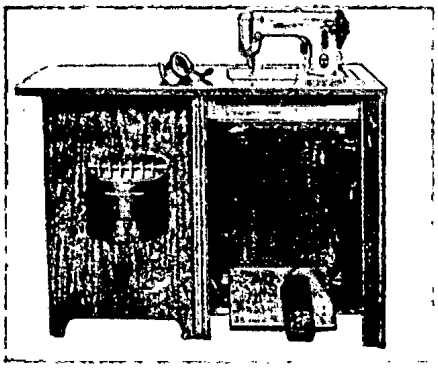
FIGURE 5. WASHING MACHINES WITH CENTRIFUGAL WRINGING DEVICES PRODUCED IN THE USSR SINCE 1959. THE WASHING CAPACITY OF THESE MACHINES IS 3½ TO 5 POUNDS OF DRY CLOTHES.



Podolsk Ekstra: A Treadle Machine

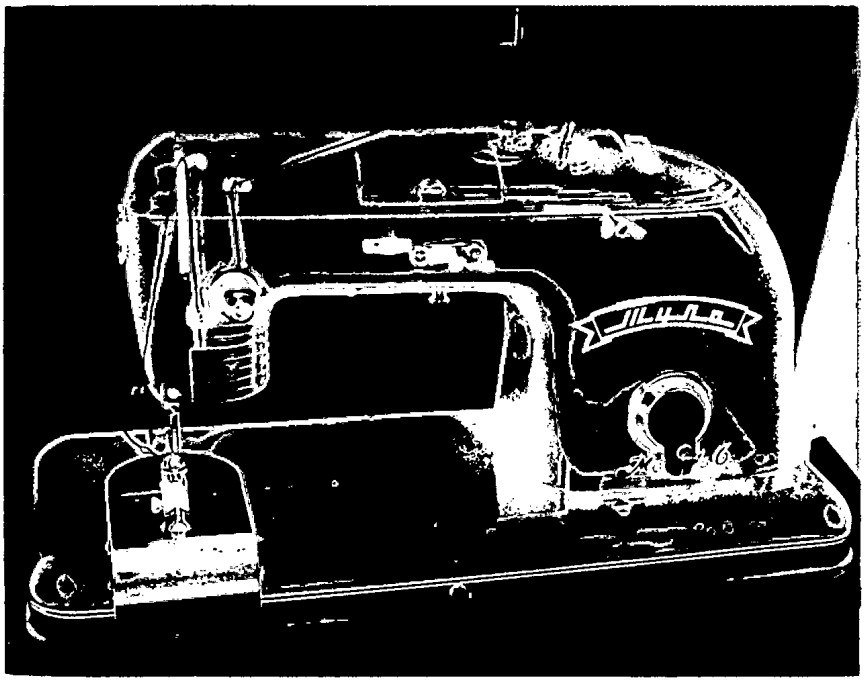


Podolsk Basic Sewing Machine Head

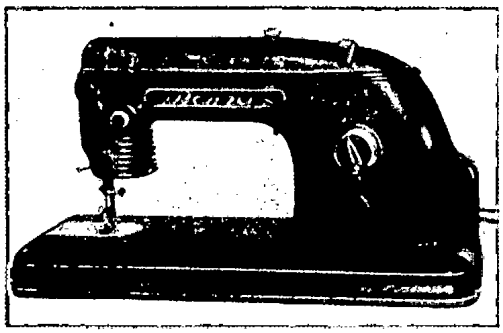


Podolsk Kabinetnaya Driven by an Electric Motor

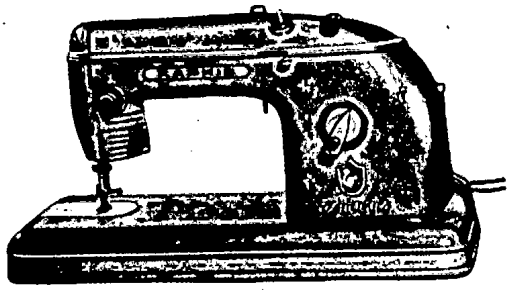
FIGURE 6. SEWING MACHINES OF FULL-SIZE MODEL PRODUCED IN THE USSR THROUGH 1961



Tula, Model 6: A Multi-stitch Type of Sewing Machine With a Zigzag Stitching Mechanism



Volga: A Straight Stitch Machine



Karkov: A Straight Stitch Machine

FIGURE 7. PORTABLE SEWING MACHINES PRODUCED IN THE USSR SINCE 1957

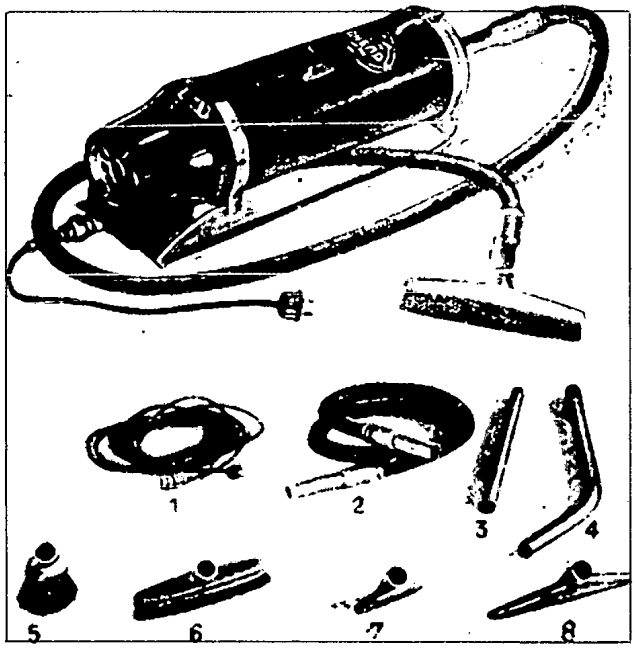
The body, or head, of the Soviet sewing machine usually is constructed of cast iron (the traditional method), although cast aluminum, used widely in Western production in postwar years, is employed to some extent in the USSR, especially where weight is important as with the portable models.

The standard, or full-size, models of Soviet-made sewing machines in treadle and cabinet designs are shown in Figure 6,* and Soviet portable sewing machines are shown in Figure 7.*

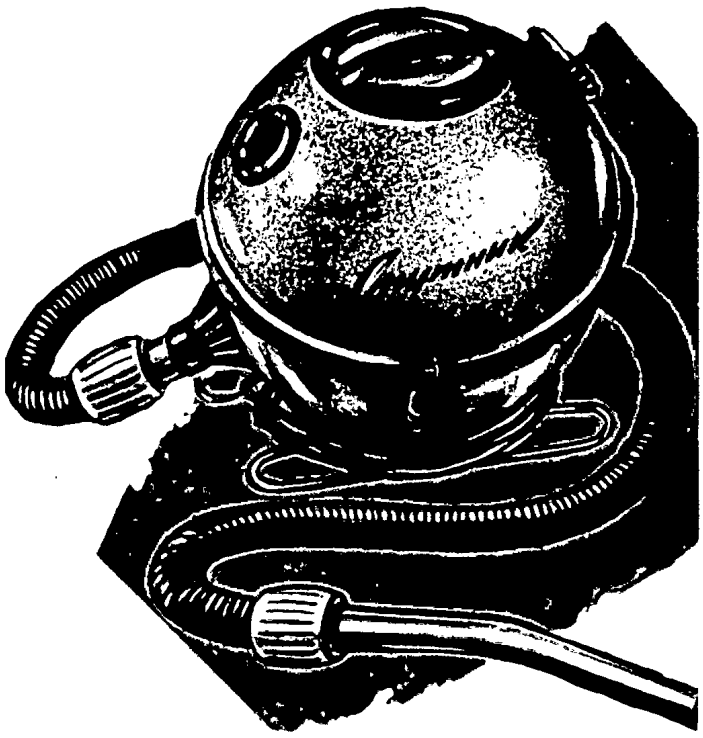
4. Vacuum Cleaners

The USSR currently produces about half a million vacuum cleaners a year, a comparatively small number by US standards. The Soviet vacuum cleaner is a tank type of machine, either cigar-shaped, such as the Dnepr and the Raketa, or spherical, such as the new Sputnik. Some 10 different models of vacuum cleaners are produced at about as many different plants, usually electrical machinery plants (see Appendix B**). Little adverse criticism is heard from consumers about cleaning performance, although complaints frequently concern the poor finish, the noisy operation, and the excessive weight of vacuum cleaners. Because of the storage problem in small living quarters, some thought is being given to production of smaller vacuum cleaners, simpler in design, and perhaps to production of hand models. Various models of Soviet vacuum cleaners are shown in Figure 8.***

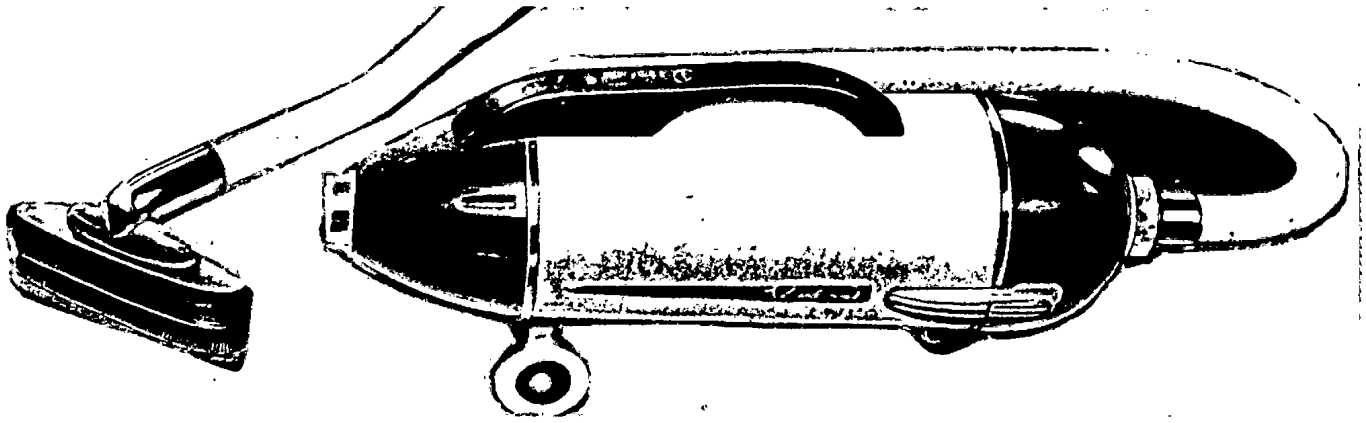
* Following p. 20, above.
** P. 23, below.
*** Following p. 21.



Dnepr



Sputnik



Raketa

FIGURE 8. VACUUM CLEANERS PRODUCED IN THE USSR 1950-61

APPENDIX B

MAJOR PRODUCERS OF HOUSEHOLD APPLIANCES IN THE USSR
1961

Refrigerators

Location and Name	Estimated Production (Thousand Units)	Product Name
Baku Consumer Electric Appliances Plant	15	Baku
Chelyabinsk Yuryuzan' Kirov Engineering Plant	25	Yuryuzan'
Dnepropetrovsk [redacted]	75	Dnepr
Leningrad [redacted]	15	Leningrad
Minsk Gas Apparatus Plant	10	N.A.
Moscow Motor Vehicle Plant imeni Likhachev (ZIL)	120	Zil Moskva
Moscow Gas Apparatus Plant	10	Sever
Murom Refrigeration Plant imeni Ordzhonikidze	60	Oka
Orenburg Refrigeration Equipment Plant	6	Orenburg Orsk
Prokop'yevsk Electrical Apparatus Plant	25	Kuzbass
Rostov-na-Donu Proletarskiy Molot Plant	10	Rostov Don
Saratov Machine Building Plant	50 to 75	Saratov
Vasil'kov Refrigeration Plant	30	Ukraina
Zaporozh'ye Melitopol' Industrial Combine	10	N.A.

50X1

Washing Machines

Location and Name	Estimated Production (Thousand Units)	Product Name
Batumi Electrical Engineering Plant	20	Batumi
Chelyabinsk N.A.	10	Zarya
Frunze Krasnyy Metallist	25	Kirgiziya
Khar'kov Galvanized Ware Plant	N.A. 3	Khar'kov Khar'kov Khemz
Irkutsk Angara Washing Machine Works	12	N.A.
Kishinev Electrical Machinery Plant imeni Kotovskiy	20	Nistru Dnestr
Moscow Kommunal'nik Machine Building Plant	25	Snezhinka
Moscow Washing Machine Plant imeni Vladimir Il'ich	25	SMR SMM
Nizhniy Tagil N.A.	N.A.	Ural
Omsk Washing Machine Plant	25	Sibir'
Riga Electrical Machine Building Plant	200	Riga 55 Riga 60
Rostov-na-Donu Washing Machine Plant	16	N.A.
Sverdlovsk Ural Electrical Appliance Plant	37	Ural

50X1

Washing Machines
(Continued)

Location and Name	Estimated Production (Thousand Units)	Product Name
Tambov Revtrud Plant	25	Tambov
Tula Stamp Plant	N.A.	Tula

Location and Name	Estimated Production (Thousand Units)	Product Name
Khar'kov Sewing Machine Plant	70	Khar'kov Bel'ka
Orsha Sewing Machine Plant	200	Belarus'
Podol'sk Machinery Plant imeni Kalinin	2,500	Tula Volga Podol'sk
Rzhev Sewing Machine Plant imeni Petrovskiy	20	Volga
Tula Weapons Plant	200	Tula

Location and Name	Estimated Production (Thousand Units)	Product Name
Batumi Electric Instruments Plant	N.A.	N.A.
Dnepropetrovsk	N.A.	
Radio Plant [redacted]		Raketa, Sputnik Dnepr Raketa

50X1

50X1

Vacuum Cleaners
(Continued)

Location and Name	Estimated Production (Thousand Units)	Product Name
Leningrad Electric Metalworking Plant	70	EP-2 Vikhr'
Mednogorsk Ural Electric Motor Plant	N.A.	Uralets
Miass Electrical Apparatus Plant	N.A.	N.A.
Moscow Aviation Plant 43	N.A.	Chayka
Prokop'yevsk Electric Machinery Plant	N.A.	Buran
Pushkino Consumer Electrical Appliance Plant	50	EShch P-1
Vil'nyus Electric Welding Equipment Plant	83	Neris Venta

50X1

APPENDIX C

METHODOLOGY

Much of the information in this report was obtained from overt source material, including Soviet newspapers, periodicals, trade journals, and handbooks. [redacted] 50X1

[redacted] 50X1

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