UNITED STATES TARIFF COMMISSION

ANTIFRICTION BEARINGS, EXCLUDING BALL BEARINGS WITH INTEGRAL SHAFTS, AND PARTS THEREOF: THE GREEN BALL BEARING CO., CLEVELAND, OHIO

Report to the President
on Investigation No. TEA-F-56
Under Section 301(c)(1) of the Trade Expansion Act of 1962

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UNITED STATES TARIFF COMMISSION

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Note.--The whole of the Commission's report to the President may not be made public since it contains information that would result in the disclosure of the operations of an individual concern. This published report is the same as the report to the President, except that the above-mentioned information has been omitted. Such omissions are indicated by asteriks.

REPORT TO THE PRESIDENT

U.S. Tariff Commission,
January 2, 1974.

To the President:

In accordance with sections 301(f)(1) and (f)(3) of the Trade Expansion Act of 1962 (76 Stat. 872; 19 U.S.C. 1801), the U.S. Tariff Commission herein reports the results of investigation No. TEA-F-56 made under section 301(c)(1) of the act to determine whether, as a result in major part of concessions granted under trade agreements, articles like or directly competitive with ball bearings (of the types provided for in items 680.35 and 680.36 of the Tariff Schedules of the United States (TSUS)) produced by The Green Ball Bearing Co., are being imported into the United States in such increased quantities as to cause, or threaten to cause serious injury to the firm.

The investigation was instituted on November 16, 1973, on the basis of a petition for adjustment assistance filed November 1, 1973, under section 301(a)(2) of the act on behalf of the firm.

Notice of the receipt of the petition and institution of the investigation was given by publication in the Federal Register of November 23, 1973 (38 F.R. 2297). No public hearing was requested and none was held.

The information contained herein was obtained principally from officials of The Green Ball Bearing Co., the Commission's files, and the staff report on investigation No. TEA-I-27, Antifriction Balls and Ball Bearings, Including Ball Bearings with Integral Shafts, and Parts Thereof.

In investigation No. TEA-I-27 the Commission found that ball bearings of the type produced by The Green Ball Bearing Co. (the type provided for in TSUS item 680.35 1/) are, as a result in major part of concessions granted thereon under trade agreements, being imported in such increased quantities as to cause serious injury to the domestic industry producing like or directly competitive products; and that in order to prevent serious injury, the rates of duty in rate column numbered 1 of item 680.35 of the TSUS must be increased to 3.4 cents per pound plus 15 percent ad valorem. 2/

1/ Commissioner Young's affirmative finding included ball bearings in TSUS item No. 680.36 as well as 680.35.

2/ Commissioners Leonard and Ablondi did not participate in the decision. Commissioner Young found that in order to remedy serious injury tariff-rate quotas must be established for TSUS item 680.35 under which the rates of duty in column numbered 1 for imports within the quotas must be 1.7 cents per pound plus 7-1/2 percent ad valorem and for imports in excess of the quotas 10 cents per pound plus 45 percent ad valorem; and the rates of duty in column numbered 1 of TSUS item No. 680.36 must be increased to 3.4 cents per pound plus 15 percent ad valorem.

Finding of the Commission

On the basis of its investigation, the Commission 1/ finds unanimously that articles like or directly competitive with ball bearings (of the types provided for in items 680.35 and 680.36 of the Tariff Schedules of the United States) produced by The Green Ball Bearing Company, Cleveland, Ohio, are not, as a result in major part of concessions granted under trade agreements, being imported into the United States in such increased quantities as to cause, or threaten to cause, serious injury to such firm.

1/ Commissioner Leonard did not participate in the decision.

Views of Chairman Bedell and Commissioner Moore 1/

This investigation was undertaken in response to a petition filed by The Green Ball Bearing Co., Cleveland, Ohio, for a determination of its eligibility to apply for adjustment assistance under section 301(c)(1) of the Trade Expansion Act of 1962. The petitioning firm produces primarily a variety of ground ball bearings of various sizes, for sale mostly in the replacement market, which constitutes about 20 percent of the total U.S. market.

Under the Trade Expansion Act of 1962, in order to make an affirmative decision with respect to this petition, we must find that:

(1) Articles like or directly competitive with the ball bearings produced by the petitioner in its Cleveland, Ohio, plant are being imported in increased quantities;

(2) The increased imports are in major part the result of tariff concessions granted under trade agreements;

(3) The petitioning firm is being seriously injured or threatened with serious injury; and

(4) The increased imports resulting in major part from trade-agreement concessions are the major factor in causing or threatening to cause, serious injury to the firm.

In determining whether increased imports are the major factor in causing, or threatening to cause, serious injury to the firm, the Commission must take into account all relevant factors contributing to the serious injury. In this regard, The Green Ball Bearing Co. has been adversely affected over the past several years by several debilitating operating problems. The company, for example, has generally been short

1/ Vice Chairman Parker and Commissioners Young and Ablondi concur in the result.

of working and other capital. To meet its minimum needs, it has relied on borrowed funds, often at high interest rates. As a consequence, interest expense has been heavy and capital resources limited. Further, the company's failure to maintain adequate financial and other records has contributed to its problems. To the extent that available records have permitted the Commission to ascertain the company's circumstances in recent years, it appears that the company was in a precarious financial and operating condition as early as 1964 -- before the time it could have been seriously affected by a heavy influx of imported ball bearings.

On the basis of the data available, we have been unable to find that increased imports of ball bearings are the major factor causing, or threatening to cause, serious injury to the petitioning firm. We have, therefore, made a negative determination.

INFORMATION OBTAINED IN THE INVESTIGATION

Description and Uses

The Green Ball Bearing Co., the petitioning firm in this investigation, is engaged principally in the manufacture of precision-ground, antifriction ball bearings. Such bearings represented approximately *** percent of the company's aggregate sales during 1968-72 and in each year during the period they accounted for not less than *** percent of total sales. In view of the contention of the petitioner that imports of ball bearings has caused the firm's financial difficulties and because there was no indication that the firm's other operations (i.e., the manufacture of roller bearings and products incorporating ball and roller bearings as components) have been adversely affected by imports, this report will focus on ball bearing operations.

Ball bearings or roller bearings generally consist of two hardened steel rings separated by balls or rollers rolling in grooves in the rings. The balls or rollers are usually spaced by a cage or retainer. A bearing is usually a self-contained unit. Ball or roller bearings may also contain shields, seals, or snap rings to fit particular applications.

Antifriction bearings of the type manufactured by the company may be classified in two broad categories: ball bearings and roller bearings. The principal differences are in the rolling elements (balls or rollers), in their respective abilities to carry loads, and in their respective costs.

Generally, ball and roller bearings are not interchangeable because each type has characteristics which make it the better choice for a certain application. Ball bearings are highly versatile and are adaptable to a wide range of loads, speeds, temperatures, and environments. Roller bearings are not so adaptable and, therefore, are more limited in their use.

Bearings in the sizes manufactured by The Green Ball Bearing Co., with an OD of over 30 mm to 52 mm, are used in the following products: alternators and generators for motor vehicles, automotive cooling fans, automotive air-conditioning clutches and compressors, household and commercial laundry equipment, electric motors, fans, blowers, compressors, bench-type power tools, machine tools, speed reducers and other mechanical power transmission devices, textile equipment, therapeutic equipment, farm machinery and implements, lawnmowers, garden tractors, and small internal combustion motors such as those used on lawnmowers, snowmobiles, and outboard motors.

Bearings in the sizes manufactured by The Green Ball Bearing Co., with an OD of 52 mm or more, are used in auto and truck propeller shafts, transmissions for all types of civilian and military self-propelled vehicles, winches and hoists, farm machinery and implements, pumps and compressors, fans and blowers, industrial refrigeration and air conditioning, industrial trucks, forklifts, food-preparation machinery, mechanical measuring and pumping devices, printing presses, papermill accessory equipment, steel rod and steel wire mill equipment, woodworking machinery, welding apparatus, and textile equipment.

U.S. Tariff Treatment

The ball bearings and parts thereof covered by this investigation are provided for in items 680.35 and 680.36 of the TSUS. These articles are currently dutiable at 1.7 cents per pound plus 7.5 percent ad valorem if entered under item 680.35; they were originally dutiable at 10 cents per pound plus 45 percent ad valorem under the Tariff Act of 1930. Duty reductions and the effective dates of such reductions are shown in the following table.

Ball bearings (except those with integral shafts) and parts (except antifriction balls): U.S. rate of duty in 1930 and changes through 1972

(Cents per pound; percent ad valorem)

Effective date	Rate of duty	Authority
June 18, 1930----	10¢ + 45%	Tariff Act of 1930.
Aug. 5, 1935----	8¢ + 35%	Trade agreement with Sweden.
Apr. 30, 1950----	4¢ + 17.5%	GATT concession.
June 30, 1956----	3.8¢ + 16.5%	Do.
June 30, 1957----	3.6¢ + 15.5%	Do.
June 30, 1958----	3.4¢ + 15%	Do.
Aug. 31, 1963----	3.4¢ + 15%	Adoption of TSUS (item 680.35).
Jan. 1, 1968----	3¢ + 13.5%	GATT concession.
Jan. 1, 1969----	2¢ + 12%	Do.
Jan. 1, 1970----	2¢ + 10.5%	Do.
Jan. 1, 1971----	2¢ + 9%	Do.
Jan. 1, 1972----	1.7¢ + 7.5%	Do.

Note.--A surcharge of 10 percent ad valorem was applicable to certain imported articles, including ball bearings and parts under item 680.35, from Aug. 16 to Dec. 19, 1971. During that period the aggregate duty applicable to such articles was 2 cents per pound plus 19 percent ad valorem. The surcharge was imposed by Presidential Proclamation No. 4074 and removed by Presidential Proclamation No. 4098.

Pursuant to the Automotive Products Trade Act of 1965 (APTA) the ball bearings and parts considered here, if imported from Canada, for use as original motor vehicle equipment, have been duty free under item 680.36. This provision was proclaimed by the President to be retroactive to January 18, 1965, following approval of the APTA on October 21, 1965.

The ad valorem equivalents of the rates of duty in effect for item 680.35 in each of the years 1964-72, based on imports entered during 1972, were as follows:

Ball bearings and parts: Ad valorem equivalents of duty rates effective in the years shown, item 680.35, 1964-72, based on imports in 1972

Year	Item 680.35
1964	16.4
1965	16.4
1966	16.4
1967	16.4
1968	14.7
1969	12.8
1970	11.3
1971	9.8
1972	8.2

Calculations of the ad valorem equivalents of the rates of duty in effect for item 680.35 in each of the years 1964-72, based on actual imports entered during each of these years are not significantly different from those shown in the above tabulation.

U.S. Producers

Ground or precision ball bearings of the type manufactured by The Green Ball Bearing Co. are manufactured by about 30 different producers in about 15 States; the majority of the producers are concentrated in the north central and northeastern United States.

A few companies dominate the domestic output of ground ball bearings. For the most part these companies are subsidiaries or subdivisions of larger corporations. New Departure, a division of General Motors Corp.; SKF Industries, Inc., a wholly owned subsidiary of Aktie Bolaget Svenska Kullager Fabriken (ABSKF), Gothenburg, Sweden; and Fafnir Bearing Co., a division of Textron, Inc., together accounted for * * * [more than half] of total U.S. production in 1972. Marlin Rockwell, division of TRW, Inc.; Federal Mogul Corp.; FAG Bearing Co., a wholly owned subsidiary of FAG Kugel Fischer Georg Schaefer and Corp., Schweinfurt, West Germany; Hoover-NSK; Ford Motor Co., and International Harvester Co. are also important producers. * * *.

* * * * * * *

Most of the leading domestic companies also produce roller bearings, but not with the same equipment and usually not in the same facility. The production of ball bearings requires specialized equipment that is not readily convertible to the manufacture of other products. Hence, plants producing ball bearings do not generally produce other products. Production facilities in the ball bearing industry are capital intensive and require highly skilled labor.

The U.S. industry produces over 50,000 different ball bearing variations; none of the U.S. companies manufacture ball bearings in all the sizes and types. For example, none of the industry's principal manufacturers produce miniature bearings (those with an OD of less than 9 mm).

Although most domestic producers manufacture many different types and sizes of bearings for competitive reasons, they seek to manufacture and sell bearings which are adaptable to high production runs, with machine changeover and retooling kept to a minimum. Some importers have concentrated on the marketing of a relatively limited number of high-volume sizes.

Several Japanese companies either produce or plan to produce ball bearings in the United States. NTN Bearing Co., a wholly owned subsidiary of Toyo Bearing Co. of Japan, constructed a modern, highly automated assembly plant at Schiller Park, Ill., in 1971;

* * *.

Hoover, a domestic company of long standing, has this year announced a joint venture with NSK, a Japanese producer, to build a U.S. plant. Koyo Seiko, one of the largest Japanese producers of ball bearings and one of the largest exporters of bearings and parts to the United States,has announced that it will begin construction of a $10 million ball bearing plant at Orangeburg, S.C., in 1974. NMB (America), previously mentioned as one of the leading U.S. producers of miniature bearings, is a Japanese-owned company.

Importers

The bulk of ball bearings and parts thereof imported from Japan are brought in by wholly owned subsidiaries of Japanese manufacturers and by large Japanese trading companies. The five Japanese producers (and their U.S. affiliates) who account for almost all of the sales to the United States from Japan are Toyo Bearing Co. (NTN Bearing Corp. of America, Des Plaines, Ill.), Koyo Seiko (American Koyo, Cleveland, Ohio), Nippon Seiko K. K. (NSK Corp., New York, N.Y.), Fujikoshi (NACHI American Co., Ltd., Maywood, N.J.), and Nippon Miniature Bearing Corp. (NMB (America), Chatsworth, Calif.). Each of the aforementioned firms except NMB imports a full line of ball bearings; NMB concentrates on the miniature and instrument sizes of ball bearings.

In addition to importing for resale, * * * [ball bearings are imported directly for use in the manufacture of other articles].

Much of the importing from Canada and European countries is done by U.S. producers of ball bearings, * * * [particularly those domestic producers owned by or affiliated with foreign corporations].

In addition to the firms cited above, Landis and Gyr, an importer of Swiss miniature bearings, and RHP, an importer of a full line of British bearings, are important suppliers of European ball bearings.

U.S. Consumption

Because ground ball bearings are so widely used in many types of machinery and equipment, their consumption is closely related to the level of industrial output and economic activity in general. Apparent U.S. consumption 1/ of ball bearings declined in both 1970 and 1971 but was larger in 1972 than in any other year in the 5-year period 1968-72 (table 1). During 1968-72, apparent consumption of ball bearings fluctuated from a low of 330 million units, valued at $434 million, in 1971 to a high of 397 million units, valued at $535 million, in 1972. Apparent consumption increased from 350 million units in 1968 to 359 million units in 1969, but then declined to 333 million units in 1970. Growth in consumption during 1968-72 was supplied entirely by increased imports. Aggregate producers' shipments (including captive and export shipments) were less in 1972 than in either 1968 or 1969.

Data on apparent U.S. consumption of ball bearings, by types and sizes, are not available for years prior to 1969. Consumption of all types and sizes of ball bearings was higher in 1972 than in any of the preceding 4 years. The U.S. economy in general and automobile production in particular were at a high level in 1972. Consumption of ball bearings over 30 mm in outside diameter generally declined in 1970 and 1971, but increased sharply in 1972. For a complete size-by-size breakdown of apparent U.S. consumption, see table 2.

1/ Computed as U.S. producers' shipments, including captive production, plus imports, less exports.

U.S. Production

U.S. production of ground ball bearings reached a peak of 272.9 million units in 1969. After declining to 237.0 million units in 1970 and to 216.3 million units in 1971, domestic production increased to 262.9 million units in 1972 (table 1). Defense and aerospace requirements, which were somewhat less in 1970 and 1971 than in previous years, were responsible for a considerable portion of the decline.

Aggregate producers' shipments 1/ (market shipments of domestically produced and imported bearings plus captive shipments plus exports) of ball bearings followed the same general trend as U.S. production during the 1968-72 period. Producers' shipments ranged from 222.5 million units, valued at $403.4 million, in 1971 to 275.4 million units, valued at $486.7 million, in 1969 (table 1). Producers' shipments in 1972 amounted to 267.8 million units, valued at $481.1 million. The quantity and value of producers' shipments in January-April 1973 increased by 18 and 22 percent, respectively, over the corresponding figures for January-April 1972.

Domestic shipments by U.S. producers, excluding captive and export shipments, declined steadily from 200.2 million units in 1968 to 159.8 million units in 1971 (table 1). While domestic shipments increased almost 20 percent in 1972, they were less in that year than they had been in either 1968 or 1969. During January-April 1973, domestic

1/ Producers' shipments exceeded U.S. production in each of the years 1968-72 because some domestic producers included in their domestic shipments quantities which they had imported.

shipments were about 20 percent larger than during January-April 1972. Domestic shipments of radial ball bearings in two size categories, 9 to 30 mm and 30 to 52 mm, declined the most during the 5-year period, while shipments of ball bearings with integral shafts had the largest increase.

The following table shows the percentage of domestic sales (excluding captive shipments) to each type of customer in 1969 and 1972:

Ground ball bearings: Percentage distribution of domestic sales (excluding captive shipments), by types of customers, 1969 and 1972

Type of customer	1969	1972
Original equipment:		
Automotive	13.9	16.0
Farm machinery	7.6	9.5
Aerospace	18.0	10.5
Construction machinery	5.7	5.5
Machine tools	3.0	2.4
Appliances	1.0	1.3
Electric motors	4.7	4.1
Other electrical	3.2	3.6
Other	16.7	16.9
Replacement market	26.2	30.2
Total	100.0	100.0

Source: Compiled from reports submitted to the U.S. Tariff Commission by the domestic producers.

The replacement market, by far the largest single market for the domestic ball bearing industry, accounted for about 30 percent of domestic sales in 1972. The leading types of original-equipment customers are automotive, aerospace, and farm machinery, in the order named. In 1969, about 18 percent of total sales went to aerospace customers; in 1972, only 10 percent.

Captive shipments (interplant transfers for own use) have accounted for about one-fourth of aggregate producers' shipments annually. Such shipments, by types and sizes, are shown in the following table:

Ground ball bearings: U.S. producers' captive shipments, by types and sizes, 1968-72

(In thousands of units)

Year	Integral shaft	Radial				All other	Total
		Less than 9 mm	9 mm and over, but not over 30 mm	Over 30 mm, but not over 52 mm	Over 52 mm		
1968	7,227	25	8,767	22,544	19,409	55	58,207
1969	8,515	43	10,334	23,678	20,936	56	63,562
1970	7,586	23	9,763	19,333	16,178	52	52,935
1971	7,394	96	8,607	18,118	14,845	48	49,108
1972	8,713	743	10,245	23,167	19,469	57	62,394

Source: Compiled from reports submitted to the U.S. Tariff Commission by the domestic producers.

The ratio of captive shipments of ball bearings to producers' total shipments, by types and sizes, is shown below for the year 1972:

Type or size	Percent
Integral shaft	34.6
Radial:	
Less than 9 mm	7.5
9 mm and over, but not over 30 mm	19.8
Over 30 mm, but not over 52 mm	26.8
Over 52 mm	27.2
All other	.2
Total	23.3

Inventories

Inventories held by producers and importers on December 31 in each of the years 1967-72 are shown in the following table:

Ground ball bearings: Inventories held by domestic producers and importers on Dec. 31 of 1967-72

(In millions of units)

Year ending Dec. 31--	Producers' inventories		Importers' inventories	
	Sizes produced by Green	All sizes	Sizes produced by Green	All sizes
1967	16.0	20.8	16.5	18.3
1968	18.4	23.6	17.8	21.7
1969	18.9	24.3	21.6	25.4
1970	20.7	26.8	28.8	33.8
1971	19.1	25.3	33.0	36.9
1972	17.6	23.0	48.0	53.2

Source: Compiled from data submitted to the U.S. Tariff Commission by the domestic producers and importers of ground ball bearings.

On the average, inventories held by producers were considerably less than 1 month's sales. Importers' inventories have traditionally been somewhat higher as a percentage of sales. Importers' inventories have increased in each of the last 5 years, and in 1972 were nearly three times the level of 1967. In 1968, importers carried about a 3 months' supply; by 1972, their inventories amounted to about 4-1/2 months' supply. The large increase in importers' inventories in 1972 occurred primarily because importers anticipated that the cost of importing would increase as a result of currency changes.

U.S. Exports

The value of U.S. exports of ball bearings exceeded the value of U.S. imports until 1966. Since then the imports have exceeded exports each year by increasing margins. The value of U.S. exports has trended upward from $28.5 million in 1966 to $33.6 million in 1972. In terms of quantity, however, U.S. exports of ball bearings fluctuated in 1968-72, within a narrow range, from 13.6 million units in 1971 to 14.8 million units in 1969. 1/ In addition to exports of ball bearings, about 2 million dollars' worth of parts have been exported annually during the last 3 years, representing a sharp decline from the $4 million to $7 million level exported annually in the 1965-69 period.

The United States exports ball bearings to many countries, but Canada, Mexico, the United Kingdom, France, and Australia have been the principal markets (table 3). In addition to the exports to these markets, exports of ball bearings to the Netherlands, Brazil, West Germany, and Japan each exceeded $1 million in 1972.

The product mix of U.S. exports differs considerably from that of domestic shipments or U.S. imports. In recent years, ball bearings other than radial or those with integral shafts (principally aircraft and thrust bearings) have accounted for about 25 percent of annual U.S. exports; such bearings have accounted for only about 10 percent

1/ Estimated by the Tariff Commission from reports submitted to it by the domestic producers.

of annual domestic shipments and for less than 3 percent of annual U.S. imports. The number of ball bearings exported during 1968-72 is shown, by types and sizes, in table 2.

U.S. Imports

The foreign value of imports of ball bearings has increased in each of the last 15 years, from $1.5 million in 1958 to $87.8 million in 1972 (table 4). 1/ During January-April 1973, imports continued to increase, amounting to $38.8 million, 53 percent higher than the value for the corresponding period of 1972. Prior to 1969, the quantity of ball bearings imported was not recorded in official statistics of the U.S. Department of Commerce. In 1969, 98.6 million ball bearings were imported; the number increased each year thereafter to 110.0 million units in 1970, 121.2 million in 1971, and 143.9 million units in 1972. For the first 9 months of 1973, imports 2/ amounted to 57.7 million units, compared with 43.0 million units during the corresponding months of 1972.

Imports of parts of ball bearings other than antifriction balls have likewise increased. The value of such imports was not segregated until 1969. The value of imports of parts amounted to $1.4 million in 1969; it was $1.2 million in 1970, $2.3 million in 1971, and $6.6 million in 1972. * * *. Imports of parts amounted to $2.1 million during January-April 1973, compared with $2.3 million during the corresponding months of 1972.

1/ Following a three-stage tariff reduction (1956-58), imports increased in value from $1.5 million in 1958 to $5.1 million in 1959; while the rate of duty was reduced by 50 percent in five stages from 1968-72, the value of imports more than doubled, increasing from $43.3 million in 1968 to $87.8 million in 1972. Imports amounted to $46.9 million in 1969, $54.3 million in 1970, and $61.1 million in 1971.

2/ Estimated in part by the Tariff Commission.

With the exception of miniature bearings, U.S. imports of ball bearings of all types and sizes have increased in recent years (table 5). From 1969 to 1972, imports of radial ball bearings over 52 mm increased by 77 percent; those in the 30-to 52-mm category increased by 51 percent, and those in the 9-to-30 mm class, by 28 percent. It is apparent from the data compiled that importers are currently increasing their share of the U.S. market in the larger sizes, the sizes produced by The Green Ball Bearing Co., at a more rapid rate than in the smaller sizes, where they had already gained a significant share of the U.S. market.

The average unit value of imported ball bearings of the sizes produced by The Green Ball Bearing Co. has increased each year, from 47 cents in 1968 to 61 cents in 1972; a portion of the increase is due to a changing product mix.

The ratio of imports to apparent consumption increased from 26 percent in 1968 to 37 percent in 1971; the ratio was 36 percent in 1972 (table 1). The quantity of U.S. producers' shipments and U.S. imports increased by about 20 percent each in 1972. Since imports increased by a larger percentage than domestic shipments during January-April 1973, the ratio of imports to consumption for that 4-month period was probably larger than it was for either 1971 or 1972. The ratio of imports to consumption, excluding captive shipments, was considerably larger than that shown above--ranging from 33 percent in 1968 to 45 percent in 1971 and 1972.

Imports have obtained their highest penetration of the U.S. market in two classes, the 9-to-30-mm category and the 30-to-52-mm size. In 1972, imports supplied 47 percent of the 9-to-30-mm size and 42 percent of the 30-to-52-mm size. The ratio of imports to consumption in sizes exceeding 52 mm steadily increased from 16 percent in 1969 to 25 percent in 1972.

More than half of all bearings used in the domestic appliance and electric motor industries are supplied by imports. Imports likewise supply a significant share of the noncaptive automotive industry. While imports still represent a very small share of the domestic market demand by the construction machinery and machine tool industries, from 1969 to 1972 imports used by these industries increased by tenfold and sevenfold, respectively. Importers' shipments to the aerospace industry in 1972 were only one-seventh of those shipped in 1969, and shipments by the domestic producers to the aerospace industry in 1972 declined to a little more than half of what they had been in 1969. The importers' share of the domestic replacement market, which is the principal market of the petitioning firm, has also been small, accounting for about 5 percent of total shipments to this market in 1972.

The following table shows the percentage of importers' sales to each type of customer in 1969 and 1972:

Ground ball bearings: Percentage distribution of importers' sales, by types of customers, 1969 and 1972

Type of customer	1969	1972
Original equipment:		
Automotive	13.5	18.2
Farm machinery	5.3	5.5
Aerospace	4.5	.5
Construction machinery	.2	1.0
Machine tools	.1	.3
Appliances	7.9	9.4
Electric motors	25.4	27.2
Other electrical	7.8	10.7
Other	19.0	16.8
Replacement market	16.3	10.4
Total	100.0	100.0

While Canada, West Germany, and the United Kingdom have been important sources of U.S. imports, Japan has been the principal source, accounting for more than 50 percent of total imports in each of the years since 1961 (table 4). In 1972, Japan accounted for 65 percent of the value of all U.S. imports of ball bearings. Switzerland, France, Sweden, Austria, and Italy have been of lesser importance as suppliers.

About 10 U.S. producers of ball bearings also import ball bearings to complement or supplement their lines.

* * * * * * *

An increasing volume of imports is being imported free of duty from Canada under the provision of the APTA.. In recent years, the value of annual imports under APTA has been as follows: 1968, $2.9 million; 1/ 1969, $2.9 million; 1/ 1970, $3.5 million; 1/ 1971, $4.1 million; and 1972, $7.3 million.

1/ Estimated.

A-20 through A-29

Data Relating to The Green Ball Bearing Co.

* * * * * * *

APPENDIX A

STATISTICAL TABLES

Table 1.--Ground ball bearings: U.S. production, aggregate U.S. producers' shipments, domestic shipments, captive shipments, U.S. exports of domestic merchandise, U.S. imports for consumption, and apparent U.S. consumption, 1968-72

(Quantity in thousands of units; value in thousands of dollars)

Year	Production	Aggregate producers' shipments	Domestic shipments 1/	Captive shipments (interplant transfer for own use)	U.S. exports 2/	U.S. imports 2/	Apparent U.S. consumption	Ratio of imports to--	
								Producers' shipments plus imports minus exports	Domestic shipments plus imports minus exports
	Quantity								
1968--	272,228	272,582	200,203	58,027	14,352	92,138	350,368	26.3	33.1
1969--	272,858	275,390	197,019	63,562	14,809	98,621	359,202	27.5	35.1
1970--	236,974	238,292	170,250	52,935	15,107	110,014	333,199	33.0	41.5
1971--	216,310	222,486	159,806	49,108	13,572	121,177	330,091	36.7	45.3
1972--	262,881	267,841	191,067	62,394	14,380	143,920	397,381	36.2	44.9
	Value								
1968--	3/	465,768	339,237	96,536	29,995	43,305	479,078	9.0	12.3
1969--	3/	486,736	346,913	109,020	30,803	46,895	502,828	9.3	12.9
1970--	3/	459,607	322,071	104,301	33,235	54,339	480,711	11.3	15.8
1971--	3/	403,398	288,125	84,464	30,809	61,105	433,694	14.0	19.2
1972--	3/	481,112	333,086	114,376	33,650	87,781	535,243	16.4	22.7

1/ Excludes captive and export shipments.
2/ Estimated in part; includes small quantities of unground ball bearings.
3/ Not available.

Source: Production, aggregate producers' shipments, domestic shipments, and captive shipments compiled from reports submitted to the U.S. Tariff Commission by domestic producers of ball bearings; imports and exports compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Ground ball bearings: Aggregate U.S. producers' shipments (domestic shipments plus captive shipments plus U.S. exports), U.S. imports for consumption, U.S. exports of domestic merchandise, and apparent U.S. consumption, by types and sizes, 1968-72

(In thousands of units)

Item	Integral shaft	Radial				All other	Total
		Less than 9 mm	9 mm and over, but not over 30 mm	Over 30 mm, but not over 52 mm	Over 52 mm		
1968:							
Aggregate producers' shipments	18,988	7,277	63,257	91,122	71,592	20,346	272,582
U.S. imports	1/	1/	1/	1/	1/	1/	2/ 92,138
U.S. exports 2/	825	440	3,037	3,262	3,431	3,357	14,352
Apparent U.S. consumption	3/	3/	3/	3/	3/	3/	350,368
Ratio of imports to apparent consumption	3/	3/	3/	3/	3/	3/	26.3
1969:							
Aggregate producers' shipments	20,987	6,705	61,483	92,422	70,649	23,144	275,390
U.S. imports	2/ 5,880	2,916	34,146	39,236	12,842	2,950	4/ 98,621
U.S. exports 2/	1,097	733	3,127	3,396	3,093	3,363	14,809
Apparent U.S. consumption	25,770	8,888	92,502	128,262	80,398	22,731	359,202
Ratio of imports to apparent consumption	22.8	32.8	36.9	30.6	16.0	13.0	27.5
1970:							
Aggregate producers' shipments	20,043	4,986	52,371	77,094	61,866	21,932	238,292
U.S. imports	2/ 8,324	3,985	38,278	44,420	12,947	1,442	4/ 110,014
U.S. exports 2/	1,385	705	2,952	3,679	3,145	3,245	15,107
Apparent U.S. consumption	26,984	8,268	87,697	117,835	71,668	20,129	333,199
Ratio of imports to apparent consumption	30.8	48.2	43.6	37.7	18.1	7.2	33.0
1971:							
Aggregate producers' shipments	22,622	4,112	44,057	69,913	61,841	19,941	222,486
U.S. imports	2/ 8,719	2,656	37,925	50,894	16,911	2,928	4/ 121,177
U.S. exports 2/	1,053	625	2,582	3,019	2,980	3,313	13,572
Apparent U.S. consumption	30,288	6,143	79,400	117,788	75,772	19,556	330,091
Ratio of imports to apparent consumption	28.8	43.2	47.8	43.2	22.3	15.0	36.7
1972:							
Aggregate producers' shipments	25,207	7,085	52,982	87,808	71,660	23,099	267,841
U.S. imports	2/ 9,215	2,695	43,720	59,326	22,723	3,884	4/ 143,920
U.S. exports 2/	1,516	431	2,444	3,220	3,196	3,573	14,380
Apparent U.S. consumption	32,906	9,349	94,258	143,914	91,187	23,410	397,381
Ratio of imports to apparent consumption	28.0	28.8	46.4	41.2	24.9	16.6	36.2

1/ Official statistics of the U.S. Department of Commerce broken down by sizes of ball bearings were not available for years prior to 1969.

2/ Estimated by the U.S. Tariff Commission.

3/ Not available.

4/ Imports from Canada of 651 thousand units in 1969, 612 thousand units in 1970, 1,144 thousand units in 1971, and 2,357 thousand units in 1972 are included in the total, but not included in the columns by types or sizes since they are not segregated in official statistics.

Note.--Apparent U.S. consumption may be slightly overstated since some of the domestic producers included in their domestic shipments ball bearings which they had imported. The ratios of imports to apparent consumption excluding captive shipments are considerably larger than those shown.

Table 3.--Ball bearings: U.S. exports of domestic merchandise, by principal markets, 1955-72 1/

(In thousands of dollars)

Year	Canada	Mexico	United Kingdom	France	Nether-lands	Brazil	West Germany	Japan	Rep. of Korea	Italy	Aus-tralia	Belgium-Luxembourg	Rep. of South Africa	Argen-tina	India	All other	Total
1955	4,716	764	316	390	129	378	26	51	2	108	1,056	114	469	185	277	3,194	12,175
1956	5,565	1,086	652	788	207	589	58	160	3	327	1,463	196	490	595	425	4,168	16,772
1957	5,397	927	503	891	279	1,029	65	348	9	397	1,527	210	578	375	382	4,780	17,697
1958	4,745	947	498	867	300	574	279	155	21	262	1,514	174	407	322	249	4,323	15,637
1959	6,289	1,082	667	774	320	338	260	164	44	211	1,283	171	346	401	131	4,247	16,728
1960	6,092	1,136	1,366	1,265	580	468	535	315	16	385	2,042	208	421	128	-	5,028	19,985
1961	6,205	1,231	1,457	1,904	350	415	880	307	10	547	930	-	474	115	9	5,949	20,783
1962	7,034	1,409	1,834	2,167	220	690	825	298	14	670	1,428	593	369	198	168	5,230	23,147
1963	7,806	1,397	2,052	1,993	216	853	606	345	9	762	1,482	588	433	257	546	5,220	24,565
1964	9,529	1,800	2,722	1,964	310	623	687	490	18	1,013	2,075	603	432	439	617	5,340	28,662
1965	6,918	2,233	2,025	1,657	363	582	574	540	47	928	1,691	567	504	465	852	5,166	25,112
1966	8,512	2,448	2,257	1,815	623	1,136	697	1,118	54	1,180	1,092	462	437	514	350	5,767	28,462
1967	10,460	2,379	2,628	2,017	521	564	713	820	98	981	1,422	495	498	363	490	4,750	29,199
1968	9,493	2,580	2,875	1,605	403	759	948	696	130	1,307	1,825	672	440	242	362	5,658	29,995
1969	9,532	2,737	2,656	1,802	576	1,019	682	940	125	1,057	1,559	761	438	456	223	6,240	30,803
1970	8,804	2,911	3,231	2,790	698	919	1,065	983	400	920	1,326	619	550	395	391	7,233	33,235
1971	8,465	2,715	2,330	2,102	636	800	1,245	702	856	966	1,304	468	558	310	462	6,890	30,809
1972	10,649	2,531	2,447	1,846	1,280	1,235	1,084	1,000	949	926	900	629	380	274	257	7,263	33,650

1/ Includes parts, 1955-64.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Ball bearings: U.S. imports for consumption, by principal sources, 1955-72

(In thousands of dollars)

Year	Japan	Canada	West Germany	United Kingdom	Switzerland	France	Sweden	Austria	Italy	Other	Total
1955	2	807	171	45	123	6	1,151	25	9	7	2,346
1956	3	231	245	56	216	6	269	21	7	3	1,057
1957	16	221	364	71	331	18	119	15	12	7	1,174
1958	17	221	663	113	232	26	156	68	32	1	1,529
1959	1,450	964	1,102	358	333	135	613	124	44	1	5,124
1960	2,314	1,179	1,464	385	522	67	473	211	96	5	6,713
1961	3,172	1,335	1,456	302	503	45	311	153	77	3	7,357
1962	6,257	1,751	2,445	534	641	92	208	305	175	7	12,415
1963	8,571	1,645	2,270	807	478	93	130	253	300	7	14,554
1964	11,563	1,970	2,620	844	455	99	127	257	448	69	18,452
1965	14,668	2,855	3,033	1,311	771	156	165	223	565	20	23,767
1966	22,340	4,559	3,451	2,213	999	102	232	270	760	280	35,206
1967	23,832	5,319	4,351	2,586	1,088	183	1,004	159	350	282	39,153
1968	29,461	5,376	3,965	2,140	939	170	461	198	311	284	43,305
1969	33,956	6,615	2,931	1,827	593	136	147	288	170	232	46,895
1970	37,521	7,547	4,492	2,787	807	240	165	381	143	256	54,339
1971	41,738	8,908	5,253	2,995	593	391	301	352	141	433	61,105
1972	57,121	15,689	8,635	3,492	824	622	456	427	236	279	87,781

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Imports of ball bearings prior to 1955 are known to be minimal.

Table 5.--Ball bearings: U.S. imports for consumption, by types and sizes, 1969-72

Type or size	1969	1970	1971	1972
	Quantity (1,000 units)			
Imports under item 680.36	1/ 651	1/ 612	1,144	2,357
Integral shaft 1/	5,880	8,324	8,719	9,215
Radial:				
Less than 9 mm	2,916	3,985	2,656	2,695
9 mm and over, but not over 30 mm	34,146	38,278	37,925	43,720
Over 30 mm, but not over 52 mm	39,236	44,420	50,894	59,326
Over 52 mm	12,842	12,947	16,911	22,723
All other	2,950	1,442	2,928	3,884
Total	98,621	110,014	121,177	143,920
	Value (1,000 dollars)			
Imports under item 680.36	1/ 1,368	1/ 1,315	2,492	5,088
Integral shaft	3,276	5,014	5,306	5,621
Radial:				
Less than 9 mm	1,762	2,088	1,553	1,627
9 mm and over, but not over 30 mm	12,161	13,058	11,569	16,751
Over 30 mm, but not over 52 mm	13,873	16,200	18,461	23,988
Over 52 mm	11,959	13,649	17,527	28,166
All other	2,496	2,015	4,197	6,550
Total	46,895	54,339	61,105	87,781

1/ Estimated by the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

A-36 through A-45

Tables and Other Information Relating to
The Green Ball Bearing Co.

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