

In the matter of:

# CERTAIN MOLDED GOLF BALLS

Investigation No. 337-TA-35

USITC PUBLICATION 897

JULY 1978



# UNITED STATES INTERNATIONAL TRADE COMMISSION

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Address all communications to  
Office of the Secretary  
United States International Trade Commission  
Washington, D.C. 20436

UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

In the Matter of:  
CERTAIN MOLDED GOLF BALLS

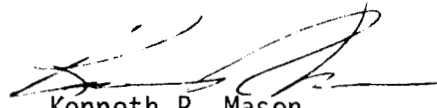
Investigation No. 337-TA-35

NOTICE AND ORDER CONCERNING COMMISSION  
DETERMINATION AND ACTION

The United States International Trade Commission conducted investigation No. 337-TA-35 pursuant to section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), of certain molded golf balls covered by the claims of U.S. Letters Patent 3,313,545. We determine that the following respondents: Seh Bang Prod. Co. Ltd., F.W. Woolworth Co., S.S. Kresge Co., National Sporting Goods, H. M. Enterprises, Inc., Daewoo International Los Angeles Corp., and Tracy International Corp. (Calif.) are in violation of the statute and hereby direct exclusion of unlicensed articles meeting the claims of the patent.

Copies of the Commission Memorandum Opinion in support of the Commission action are available to the public during official working hours at the Office of the Secretary, United States International Trade Commission, 701 E Street NW., Washington, D.C. 20436. Notice of the institution of the investigation was published in the Federal Register on July 6, 1977 (42 F.R. 34558).

By order of the Commission:

  
Kenneth R. Mason  
Secretary

Issued: July 6, 1978



UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D. C.


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In the Matter of )  
CERTAIN MOLDED GOLF BALLS )  
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Investigation No. 337-TA-35

ORDER CANCELLING PREHEARING CONFERENCE AND HEARING

Notice is hereby given that the Prehearing Conference and Hearing in this matter, presently scheduled for January 20 and January 27, 1978, respectively, are cancelled. The Respondents have indicated that they will not attend the hearing, and the Complainant and the Staff have submitted a motion for summary determination as to all issues and all respondents. The Presiding Officer has determined that the motion as filed is sufficient to form the basis of a recommended determination under Rule 210.50(f), and therefore no evidenciary hearing is required.

The Secretary shall serve a copy of this order upon all parties of record and shall publish this order in the Federal Register.

  
\_\_\_\_\_  
Judge Myron R. Renick  
Presiding Officer

Issued January 18, 1978.



UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

[337-TA-35]

CERTAIN MOLDED GOLF BALLS

Notice and Order Concerning Procedure for  
Commission Action

Notice is hereby given that--

On February 10, 1978, the Presiding Officer in investigation No. 337-TA-35 [Certain Molded Golf Balls], an investigation being conducted by the United States International Trade Commission under the authority of section 337 of the Tariff Act of 1930, issued his recommended determination that:

1. The Commission determine that there is a violation of section 337 in the importation or sale in the United States of certain molded golf balls meeting the claims of U.S. Letters Patent 3,313,545; and, further
2. The Commission grant complainant's and the investigative staff's motion for summary determination [Motion Docket No. 35-3] under Commission rule 210.50 on all issues; and, further
3. The Commission dismiss certain enumerated respondents in the investigation for the reason that they have not been shown to be involved in the manufacture, importation or sale of infringing products.

An addendum to the recommended determination removing certain respondents, who had inadvertently been included with other enumerated respondents not shown to be involved in the manufacture, importation or sale of molded golf balls in violation of section 337, was issued by the Presiding Officer on February 23, 1978. The Presiding Officer has certified the evidentiary

record to the Commission for its consideration. Copies of the Presiding Officer's recommended determination and the addendum to the recommended determination may be obtained by interested persons by contacting the Office of the Secretary to the Commission, 701 E Street, N.W., Washington, D.C. 20436, telephone (202) 523-0161.

Requests for oral argument and oral presentation. At present, no oral argument is planned with respect to the recommended determination of the presiding officer concerning whether, in this matter, there is a violation of section 337 of the Tariff Act of 1930. Similarly, no oral presentation is planned with respect to the subject matter of section 210.14(a) of the Commission's Rules of Practice and Procedure [19 C.F.R. § 210.14(a)] concerning relief, bonding and the public interest factors set forth in sections 337(d) and (f) of the Tariff Act of 1930, as amended (19 U.S.C. 1337), which the Commission is to consider in the event it determines that there should be relief. However, the Commission will consider requests for an oral argument or an oral presentation if received by the Secretary of the Commission not later than 30 days after publication of this notice in the Federal Register.

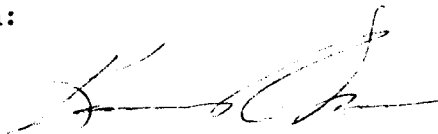
Written submissions from the parties, other interested persons, Government agencies and departments, Governments or the public with respect to the recommended determination and the subject matter of subsections (a)(1), and (a)(2), and (a)(3) of section 210.14 of the Commission's rules of Practice and Procedure [19 C.F.R. § 210.14 (a)(1), (2), and (3)] (i.e., with respect to remedy, bonding, and the public interest) will be considered



by the Commission if received not later than 45 days after publication of this notice in the Federal Register.

Notice of the Commission's institution of the investigation was published in the Federal Register of July 6, 1977 [42 F.R. 34558].

By order of the Commission:

A handwritten signature in black ink, appearing to read 'K. R. Mason', written over a horizontal line.

KENNETH R. MASON  
Secretary

Issued: March 17, 1978



UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

In the Matter of  CERTAIN MOLDED GOLF BALLS	) ) ) ) ) )	Investigation No. 337-TA-35
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NOTICE OF INVESTIGATION

Notice is hereby given that a complaint was filed with the United States International Trade Commission on April 14, 1977, and an amendment filed June 13, 1977, under section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), on behalf of PCR Golf Ball Co., Inc., Rocky Hill, New Jersey, alleging that unfair methods of competition and unfair acts exist in the importation of molded golf balls into the United States, or in their sale, by reason of the alleged coverage of such articles by claims 1-9, 13 and 14 of U.S. Letters Patent 3,313,545. It alleges that the effect or tendency of the unfair methods of competition and unfair acts is to destroy or substantially injure an industry, efficiently and economically operated, in the United States. Complainant requests a permanent exclusion from entry into the United States of the imports in question or, alternatively, a cease and desist order with respect to such imports.

Having considered the complaint, the United States International Trade Commission, on June 30, 1977, ORDERED--

(1) That, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), an investigation be

instituted to determine, under subsection (c), whether, on the basis of the allegations set forth in the complaint, there is a violation of subsection (a) of this section in the unauthorized importation of molded golf balls into the United States, or in their unauthorized sale, by reason of such golf balls allegedly being covered by claims 1-9, 13 and 14 of U.S. Letters Patent 3,313,545, the effect or tendency of which is to destroy or substantially injure an industry, efficiently and economically operated, in the United States;

(2) That, for the purpose of the investigation so instituted, the following persons, alleged to be involved in the unauthorized importation of such articles into the United States, or in their sale, are hereby named as respondents upon which the complaint and this notice are to be served:

Foreign Manufacturers and Exporters

Seibu Polymer  
Chemical Co., Ltd.  
16-15, Minami Ikebukuro  
1 Chome, Toshima-ku  
Tokyo, Japan

Hayakawa Rubber Co., Ltd.  
1-32, Matsuyamacho  
2 Chome, Fukuyama, Japan

Daiwa Seiko, Inc.  
14-16, Maesawa 3 Chome  
Higashi-Kurume, Tokyo, Japan

Far East Honsha Co., Ltd.  
26, Bingocho 3 Chome  
Higashi-ku, Osaka, Japan

Daewoo Industrial Co., Ltd.  
CPO Box 2810  
Seoul, Korea

Seh-Bang Prod. Co. Ltd.  
CPO Box 3469  
Seoul, Korea

Dong Sung Chemical  
Ind. Co. Ltd.  
CPO Box 5117  
Seoul, Korea

Eagle Enterprises Co. Ltd.  
1st Floor, Kuang Lung Bldg.  
3-1, Chen, Chiang Street  
Taipei, Taiwan, Republic of China

Li and Fung  
615-8, 9th Floor  
Lin Shen North Road  
Taipei, Taiwan, Republic of China

Seoul Chemical Company  
24-23 1-Ku Chungmuro Chung-Ku  
Seoul, Korea

Kimpo Chemical Company  
Seoul, Korea

Importers

Putt-R-Golf Incorporated  
3914 W. Market Street  
Akron, Ohio 44313

S & Y Enterprises  
5205 W. Ottawa Avenue  
Littleton, Colorado 80123

Tracy International Corp.  
3549 Haven Avenue  
Menlo Park, California 94025

John A. Elliott  
c/o Shambrock Golf Co.  
1748 21 Street  
Santa Monica, California 90404

Imperial Golf Sales Co.  
124 E. Hunter  
Santa Ana, California 92711

Western Golf Supply  
1831 Colorado  
Santa Monica, California 90406

Exim Co.  
145-20 39 Avenue  
Flushing, New York 11354

Seh Bang America  
9060 Palisades Avenue  
North Bergen, New Jersey 07047

Tracy International  
344 Main Street  
Hackensack, New Jersey 07601

Fred Akel Co.  
13301 Beach Boulevard  
Jacksonville, Florida 32216

Chugai Boyeki America Corp.  
51 Madison Avenue  
New York, New York 10010

Dae Woo International America Corp.  
350 Fifth Avenue  
New York, New York 10001

Dae Woo International Los Angeles  
Corporation  
150 Carob Street  
Compton, California 90220

Dunbar Customs Services  
P. O. Box 91474  
Los Angeles, California 90009

F.W. Woolworth Company  
233 Broadway  
New York, New York 10007

Gambles Import Corporation  
North 2777 Ontario Street  
Burbank, California 91504

H.M. Enterprise Incorporated  
39 W. 32nd Street  
New York, New York 10001

Kumbo U.S.A. Incorporated  
4032 Wilshire Boulevard  
Los Angeles, California 90010



Douglas Ltd.  
2800 Juniper Street  
Fairfax, Virginia 23669

S.S. Kresge Company  
3100 W. Big Beaver Road  
Troy, Michigan 48084

Ajay Sports  
Division of Fuqua Industries  
Delavan, Wisconsin 53115

Marlot Color & Chemical Company Inc.  
P.O. Box 13  
Hawthorne, New Jersey 05707

Sportsotron, Inc.  
Hauppauge, New York 11787

Midland International Corp.  
1900 Johnson Drive  
Shawnee Mission, Kansas 66205

National Sporting Goods Co.  
1107 Broadway  
New York, New York 10010

(3) That, for the purpose of the investigation so instituted, Judge Myron R. Renick, United States International Trade Commission, 701 E Street, N.W., Washington, D.C. 20436 is hereby appointed as presiding officer; and

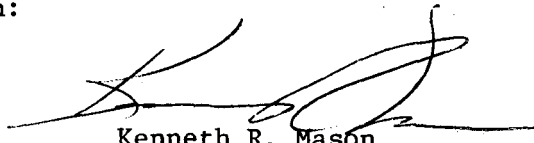
(4) That, for the purpose of the investigation so instituted, Charles F. Schill, United States International Trade Commission, 701 E Street, N.W., Washington, D.C. 20436, is hereby named as Commission investigative attorney.

Responses must be submitted by the parties in accordance with section 210.21 of the Commission's Rules of Practice and Procedure, as amended (41 F.R. 17710, April 27, 1976). Pursuant to sections 210.16(d) and 210.21(a) of the Rules, such responses will be considered by the Commission if received not later than 20 days after the date of service of the complaint. Extensions of time for submitting a response will not be granted unless good and sufficient cause therefor is shown.

Failure of a respondent to file a timely response to each allegation in the complaint and in this notice may be deemed to constitute a waiver of the right to appear and contest the allegations of the complaint and of this notice, and will authorize the presiding officer and the Commission, without further notice to the respondent, to find the facts to be as alleged in the complaint and this notice and to enter both a recommended determination and a final determination, respectively, containing such findings.

The complaint, with the exception of confidential information referred to therein, is available for inspection by interested persons at the Office of the Secretary, United States International Trade Commission Building, Washington, D.C., and in the New York City office of the Commission, 6 World Trade Center.

By order of the Commission:



Kenneth R. Mason  
Secretary

Issued: June 30, 1977

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U.S. INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

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In the Matter of }  
CERTAIN MOLDED GOLF BALLS }  
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Investigation No. 337-TA-35


OFFICE OF THE SECRETARY  
U.S. INTL. TRADE COMMISSION

NOTICE OF PREHEARING CONFERENCE AND HEARING

Notice is hereby given that a Prehearing Conference will be held in connection with the above styled investigation at 10:00 a.m. on January 10, 1978, in the Hearing Room of the Administrative Law Judge, Room 610 Bicentennial Building, 600 E Street, N.W., Washington, D.C. On or before January 6, 1978, the parties will have completed service of Prehearing Conference Statements by order of the Presiding Officer. The purpose of this Prehearing Conference is to review such statements, complete the exchange of exhibits, and resolve any other necessary matters in preparation for the hearing.

Notice is also given that the hearing in this proceeding will commence at 10:00 a.m. on January 17, 1978, in the Hearing Room of the Administrative Law Judge, Room 610 Bicentennial Building, 600 E Street, N.W., Washington, D.C., and will continue daily until completed.

The Secretary shall serve a copy of this Notice upon all parties of record, and shall publish this Notice in the Federal Register.

  
\_\_\_\_\_  
Judge Myron R. Renick  
Presiding Officer

Issued December 7, 1977





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UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

OFFICE OF THE SECRETARY  
U.S. INTL. TRADE COMMISSION

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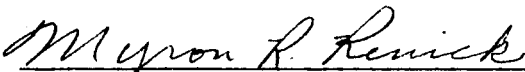
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In the Matter )  
CERTAIN MOLDED GOLF BALLS )  
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Investigation No. 337-TA-35

NOTICE OF CONTINUANCE

Notice is hereby given that the prehearing conference and hearing in this matter are continued for ten (10) days until January 20 and January 27, 1978, respectively, pending the Presiding Officer's consideration of the motion for summary determination. Notice of this investigation was published in the Federal Register on July 6, 1977 (42 F.R. 34558).

The Secretary shall serve a copy of this notice upon all parties of record and shall publish it in the Federal Register.

  
\_\_\_\_\_  
Judge Myron R. Renick  
Presiding Officer

Issued January 9, 1978.



UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

In the Matter of:            )  
                                  )  
CERTAIN MOLDED GOLF BALLS)

Investigation No. 337-TA-35

COMMISSION DETERMINATION AND ACTION

The United States International Trade Commission conducted investigation No. 337-TA-35 pursuant to section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), of certain molded golf balls covered by the claims of U.S. Letters Patent 3,313,545. We determine that the following respondents: Seh Bang Prod. Co. Ltd., F.W. Woolworth Co., S.S. Kresge Co., National Sporting Goods, H. M. Enterprises, Inc., Daewoo International Los Angeles Corp., and Tracy International Corp. (Calif.) are in violation of the statute and hereby direct exclusion of unlicensed articles meeting the claims of the patent.

Procedural History

On April 14, 1977, a complaint was filed with the United States International Trade Commission and an amendment was filed June 13, 1977, under section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), on behalf of PCR Golf Ball Company, Inc., of Rocky Hill, New Jersey (hereinafter complainant), alleging that unfair methods of competition and unfair acts exist in the importation of molded golf balls into the United States, or in

their sale, by reason of the coverage of such articles by claims 1-9, 13 and 14 of U.S. Letters Patent 3,313,545, the effect or tendency of such unlicensed importation being to destroy or substantially injure an industry, efficiently and economically operated, in the United States. Accordingly, complainant sought an order of exclusion against the imports in question. On June 30, 1977, the Commission instituted an investigation thereof and published a notice of investigation in the Federal Register of July 6, 1977 (42 F.R. 34558).

Copies of the complaint, the amendment to the complaint, and notice of investigation were served upon eleven foreign manufacturers and exporters, and 25 domestic importers named as respondents. 1/ Nine respondents filed formal answers required by section 210.21 of the Commission's Rules of Practice and Procedure (19 C.F.R. section 210.21) and 12 respondents submitted letters. Fifteen responded not at all. On August 18, 1977, the presiding officer issued a notice of preliminary conference for August 31, 1977, but no respondent attended the conference.

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1/ Seibu Polymer Chemical Co., Ltd.; Hayakawa Rubber Co., Ltd.; Daiwa Seiko, Inc.; Far East Honsha Co., Ltd.; Daewoo Industrial Co., Ltd.; Seh-Bang Prod. Co. Ltd.; Dong Sun Chemical Ind. Co. Ltd.; Eagle Enterprises Co. Ltd.; Li and Fung; Seoul Chemical Company; Kimpo Chemical Company; Putt-R-Golf Incorporated; S & Y Enterprises; Tracy International Corp. (California); John A. Elliott (Shamrock Golf Co.); Imperial Golf Sales Co.; Western Golf Supply; Exim Co.; Seh Bang America; Tracy International (New Jersey); Fred Akel Co.; Chugai Boyeki America Corp.; Daewoo International America Corp.; Daewoo International Los Angeles Corp.; Dunbar Customs Services; F. W. Woolworth Company; Gambles Import Corporation; H.M. Enterprise Incorporated; Kumho U.S.A. Incorporated; Douglas Ltd.; Ajay Sports, Division of Fuqua Industries; Sportsotron, Inc.; National Sporting Goods Co.; S. S. Kresge Company; Marlot Color & Chemical Company, Inc.; and Midland International Corp.

The presiding officer on October 4, 1977, ordered 27 respondents 1/ to answer certain of complainant's first set of interrogatories which had been served on July 25, 1977. Complainant filed a motion on December 12, 1977, for an order imposing sanctions against 21 of the respondents who had been ordered to respond. 2/ The presiding officer acting under the authority conferred in section 210.36(b)(4) of the Commission's Rules (19 C.F.R. section 210.36(b)(4)) ordered on December 23, 1977, that the 21 respondents would not be permitted to object to the introduction and use of secondary evidence to show what their withheld testimony, documents, or other evidence would have shown.

On January 6, 1978, complainant and the Commission investigative staff filed a joint motion for summary determination under section 210.50 of the Commission's Rules (19 C.F.R. section 210.50) against 25 respondents. 3/

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1/ National Sporting Goods Co.; Marlot Color & Chemical Co.; Sportsotron, Inc.; Hayakawa Rubber Co., Ltd.; Daiwa Seiko, Inc.; Dong Sung Chemical Ind. Co., Ltd.; Li and Fung; Putt-R-Golf, Inc.; Tracy International Corp.; Exim Co.; Tracy International; Gambles Import Corp.; H. M. Enterprise, Inc.; Douglas, Ltd.; Daewoo Industrial Co., Ltd.; Eagle Enterprises Co., Ltd.; Seoul Chemical Co.; Kimpo Chemical Co.; S & Y Enterprises; John A. Elliott; Seh Bang America; Fred Akel Co.; Dae Woo International Los Angeles Corp.; F. W. Woolworth Co.; Dae Woo International America Corp.; Kumho U.S.A., Inc.; and Seh-Bang Prod. Co., Ltd.

2/ Dae Woo International America Corp. (Calif.); Kumho U.S.A., Inc.; Hayakawa Rubber Co., Ltd.; Daiwa Seiko, Inc.; Dae Woo International America Corp. (New York); Seh-Bang Prod. Co., Ltd.; Tracy International Corp. (Calif.); John A. Elliott; Exim Co.; Seh Bang America; Tracy International (New Jersey); Dong Sun Chemical Co., Ltd.; Eagle Enterprises Co., Ltd.; Li and Fung; Seoul Chemical Company; Kimpo Chemical Company; Putt-R-Golf, Inc.; S & Y Enterprises; Dae Woo Industrial Co., Ltd. (Seoul); Dougall, Ltd.; Marlot Color & Chemical Co., Inc.

3/ Daiwa Seiko, Inc.; Seh-Bang Prod., Co., Ltd.; Dong Sung Chemical; Seoul Chemical Co.; Kimpo Chemical Co.; Putt-R-Golf, Inc.; S & Y Enterprises; Tracy International Corp. (Calif.); Exim Co.; Seh Bang America; Tracy International (New Jersey); Chugai Boyeki America Corp.; Daewoo International America Corp.; Daewoo International Los Angeles Corp.; Dunbar Customs Services; F. W. Woolworth Co.; Gambles Import Corp.; H. M. Enterprises, Inc.; Kumho U.S.A., Inc.; Ajay Sports; Sportsotron Inc.; National Sporting Goods Co.; S. S. Kresge Co.; Marlot Color & Chemical Co., Inc.; and Midland International Corp.



The motion for summary determination was supported by affidavits from the president of complainant, a Commission commodity-industry analyst, and a research chemist who analyzed the results of the analysis by an independent research laboratory of the sample molded golf balls. The presiding officer cancelled the scheduled prehearing conference and hearing by an order issued on January 18, 1978. The order stated that the hearing was cancelled because no respondent indicated an intent to attend the hearing and the presiding officer determined that the joint motion is sufficient to form the basis of a recommended determination, and therefore no evidentiary hearing is required. None of the respondents opposed the joint motion.

Accordingly, on February 10, 1978, the presiding officer issued his recommended determination, under section 210.53 of the Commission's Rules (19 C.F.R. section 210.53) that the Commission:

1. (D)etermine that there is a violation of Section 337 in the importation or sale in the United States of certain molded golf balls meeting the claims of United States Letters Patent 3,313,545 by Respondents Daiwa Seiko, Inc., Seh-Bang Prod., Co., Ltd., Dong Sung Chemical, Seoul Chemical Co., Kimpo Chemical Co., Putt-R-Golf, Inc., S & Y Enterprises, Tracy International Corp. (Calif.), Exim Co., Seh Bang America, Tracy International (New Jersey), Chugai Boyeki America Corp., Daewoo International America Corp., Daewoo International Los Angeles Corp., Dunbar Customs Services, F. W. Woolworth Co., Gambles Import Corp., H. M. Enterprises, Inc., Kumho U.S.A., Inc., Ajay Sports, Sportsotron Inc., National Sporting Goods Co., S. S. Kresge Co., Marlot Color & Chemical Co., Inc., Midland International Corp.; and further,
2. (G)rant Complainant's and Investigative Staff's motion for summary determination under Rule 210.50 on all issues (Motion Docket 35-3) to the extent not inconsistent with this Recommended Determination; and
3. (F)ind Respondents Fred Akel Company, Western Golf Supply, Hayakawa Rubber Co., Ltd., Eagle Enterprises Co., Ltd., John A. Elliot (Shamrock Golf Co.), Imperial Golf Sales Co., Douglas, Ltd., Seibu Polymer Chemical Co., Far East Honsha Co., Ltd., Li and Fung, and Daewoo International Co., Ltd., are not in violation of Section 337.

On February 23, 1978, the presiding officer issued an addendum to the recommended determination removing from conclusion of law number 2 the respondents listed in finding of fact number 33 who were inadvertently included in a list of respondents who had not been shown to be involved in the manufacture, importation or sale of molded golf balls in violation of section 337.

No respondent filed exceptions or alternative findings of fact and conclusions of law to the presiding officer's recommended determination pursuant to section 210.54 of the Commission's Rules (19 C.F.R. section 219.54).

The Commission issued a notice and order on March 17, 1978, concerning the procedure for Commission action on the recommended determination, relief, bonding, and the public interest factors set forth in section 337(d) and (f), which the Commission is to consider in the event it determines that there is a violation of the statute. Parties, other interested persons, government agencies and departments, governments, and the public were given until close of business May 8, 1978, to file written submissions. Pursuant to the notice, requests for oral argument or oral presentations would have been considered if received by April 21, 1978. No request for an oral argument or an oral presentation was received; and written submissions were received only from the complainant and from the Commission investigative staff.

#### Commission Determination

Having reviewed (1) the evidentiary record in this matter, consisting of the motion for summary determination, together with exhibits and affidavits

attached thereto, as certified to the Commission by the presiding officer, (2) the presiding officer's recommended determination and supplemental documents and the addendum to the recommended determination, and (3) the written submissions from the Commission investigative staff filed on April 21, 1978, and from the complainant filed on May 1, 1978, the Commission on June 15, 1978, determined:

1. To dismiss Hayakawa Rubber Co., Ltd., Eagle Enterprises Co., Ltd., John A. Elliot (Shamrock Golf Co.), Imperial Golf Sales Co., Fred Akel Company, Douglas, Ltd., Seibu Polymer Chemical Co., Ltd., Far East Honsha Co., Ltd., Li and Fung, Western Golf Supply, Daewoo International Co., Ltd., Dong Sung Chemical Ind. Co., Ltd., Putt-R-Golf Inc., Exim Co., Gambles Import Corp., Marlot Color & Chemical Co., Inc., Seoul Chemical Company, Kimpo Chemical Company, S & Y Enterprises, Seh Bang America, Daiwa Seiko, Inc., Chugai Boyeki America Corp., Dunbar Customs Service, Kumho U.S.A. Inc., Ajay Sports, Sportsotron Inc., Midland International Corp., Tracy International (New Jersey), and Daewoo International America Corp. as respondents in the investigation because they have not been shown to be involved in the manufacture, importation or sale of molded golf balls in violation of section 337;
2. That the joint motion for summary determination of complainant and the Commission investigative staff should be granted to the extent that it is not inconsistent with this determination for the reasons that there is no genuine issue as to any material fact and that the moving parties are entitled to summary determination as a matter of law (motion docket number 35-3);
3. That there is a violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), by reason of the importation into the United States of certain molded golf balls, or in their sale by the owner, importer, consignee, or agent of either, because such articles infringe claim 1 1/ of United States Letters Patent 3,313,545, thereby constituting an unfair method or unfair act within the meaning of section 337; and the effect or tendency of such unfair method or act is to destroy or substantially injure an industry, efficiently and economically operated, in the United States;

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<sup>1/</sup> The sample golf balls that were tested by an independent testing laboratory are a direct and literal infringement of claim 1, which is the broadest claim of the patent (Recommended Determination, Findings 21, 25, and 30).

On February 23, 1978, the presiding officer issued an addendum to the recommended determination removing from conclusion of law number 2 the respondents listed in finding of fact number 33 who were inadvertently included in a list of respondents who had not been shown to be involved in the manufacture, importation or sale of molded golf balls in violation of section 337.

No respondent filed exceptions or alternative findings of fact and conclusions of law to the presiding officer's recommended determination pursuant to section 210.54 of the Commission's Rules (19 C.F.R. section 219.54).

The Commission issued a notice and order on March 17, 1978, concerning the procedure for Commission action on the recommended determination, relief, bonding, and the public interest factors set forth in section 337(d) and (f), which the Commission is to consider in the event it determines that there is a violation of the statute. Parties, other interested persons, government agencies and departments, governments, and the public were given until close of business May 8, 1978, to file written submissions. Pursuant to the notice, requests for oral argument or oral presentations would have been considered if received by April 21, 1978. No request for an oral argument or an oral presentation was received; and written submissions were received only from the complainant and from the Commission investigative staff.

#### Commission Determination

Having reviewed (1) the evidentiary record in this matter, consisting of the motion for summary determination, together with exhibits and affidavits

attached thereto, as certified to the Commission by the presiding officer, (2) the presiding officer's recommended determination and supplemental documents and the addendum to the recommended determination, and (3) the written submissions from the Commission investigative staff filed on April 21, 1978, and from the complainant filed on May 1, 1978, the Commission on June 15, 1978, determined:

1. To dismiss Hayakawa Rubber Co., Ltd., Eagle Enterprises Co., Ltd., John A. Elliot (Shamrock Golf Co.), Imperial Golf Sales Co., Fred Akel Company, Douglas, Ltd., Seibu Polymer Chemical Co., Ltd., Far East Honsha Co., Ltd., Li and Fung, Western Golf Supply, Daewoo International Co., Ltd., Dong Sung Chemical Ind. Co., Ltd., Putt-R-Golf Inc., Exim Co., Gambles Import Corp., Marlot Color & Chemical Co., Inc., Seoul Chemical Company, Kimpo Chemical Company, S & Y Enterprises, Seh Bang America, Daiwa Seiko, Inc., Chugai Boyeki America Corp., Dunbar Customs Service, Kumho U.S.A. Inc., Ajay Sports, Sportsotron Inc., Midland International Corp., Tracy International (New Jersey), and Daewoo International America Corp. as respondents in the investigation because they have not been shown to be involved in the manufacture, importation or sale of molded golf balls in violation of section 337;
2. That the joint motion for summary determination of complainant and the Commission investigative staff should be granted to the extent that it is not inconsistent with this determination for the reasons that there is no genuine issue as to any material fact and that the moving parties are entitled to summary determination as a matter of law (motion docket number 35-3);
3. That there is a violation of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), by reason of the importation into the United States of certain molded golf balls, or in their sale by the owner, importer, consignee, or agent of either, because such articles infringe claim 1 1/ of United States Letters Patent 3,313,545, thereby constituting an unfair method or unfair act within the meaning of section 337; and the effect or tendency of such unfair method or act is to destroy or substantially injure an industry, efficiently and economically operated, in the United States;

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<sup>1/</sup> The sample golf balls that were tested by an independent testing laboratory are a direct and literal infringement of claim 1, which is the broadest claim of the patent (Recommended Determination, Findings 21, 25, and 30).



4. That the appropriate remedy for such violation is to direct that certain molded golf balls made in accordance with claim 1 of United States Letters Patent 3,313,545 be excluded from entry into the United States for the term of said patent;
5. That, after considering the effect of such exclusion upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, such articles should be excluded from entry; and
6. That the bond provided for in subsection (g)(3) of section 337 of the Tariff act of 1930 (19 U.S.C. 1337(g)(3)) is determined by the Commission to be in the amount of 80 percent of the value of the articles concerned, f.o.b. foreign port.

#### 1. Violation.

Our determination of violation is predicated upon the following bases:

1. The Commission has jurisdiction over the subject matter of the investigation and over the respondents named by the Commission in its notice of investigation (19 U.S.C. 1337).
2. Patent infringement has been held to be an "unfair method of competition and unfair act" for the purposes of section 337 of the Tariff Act of 1930, as amended (See, e.g., In re Northern Pigment Co., et al., 71 F.2d 447 (C.C.P.A. 1934) and In re von Clemm, 229 F.2d 441 (C.C.P.A. 1955)).
3. Complainant is the owner of U.S. Letters Patent 3,313,545 by virtue of an assignment from the inventor, James R. Bartsch, filed with the U.S. Patent Office August 4, 1966, (Recommended Determination, Finding 3). Complainant is therefore a proper party to bring a section 337 proceeding with infringement of said patent as the basis for an "unfair method of competition or unfair act."
4. U.S. Letters Patent 3,313,545 was issued on April 11, 1967. It is a valid and enforceable patent for the purposes of section 337, and presumed valid under 35 U.S.C. 282 (Recommended Determination, Findings 15-16).
5. It is impossible to determine visually whether the imported golf balls infringe the claims of United States Letters Patent 3,313,545, because the invention is in the chemical composition (Recommended Determination, Finding 20). Samples of the accused imported products from Seh Bang Prod. Co., Ltd., F. W. Woolworth Co., S. S. Kresge Co., National Sporting Goods, H. M.

Enterprises, Inc., Daewoo Internatiopnal Los Angeles Corp., and Tracy International Corp. (Calif.) were tested by an independent testing laboratory and directly and literally infringe claim 1 of United States Letters Patent 3,313,545 (Recommended Determination, Findings 25 and 31).

6. Complainant and its licensees constitute a domestic industry for purposes of section 337 by producing and selling in the United States molded golf balls covered by United States Letters Patent 3,313,545 (Recommended Determination, Findings 18-19).
7. The domestic industry has suffered substantial economic injury from the loss of sales and resultant loss of revenue by reason of the importation and sale of articles which infringe the claims of U.S. Letters Patent No. 3,313,545 (Recommended Determination, Findings 68-72).
8. On motion pursuant to section 210.50(b) of the Commission's Rules (19 C.F.R. section 210.50(b)), movant is entitled to summary determination if the pleadings and any depositions, admissions on file, and affidavits show that there is no genuine issue as to any material fact and that the moving party is entitled to a summary determination as a matter of law. Our review of the record certified to us by the presiding officer does not reveal a genuine issue as to any material fact. Furthermore, the facts as found by the presiding officer and adopted in our opinion lead to our conclusion that the moving party is entitled to a summary determination as a matter of law.

During the time that this proceeding was before the presiding officer, it was characterized by virtual nonparticipation by all respondents. The presiding officer concluded in his recommended determination that the 18 respondents named in finding 33, 1/ from whom samples were not obtained and tested, should be included with the seven respondents who are in violation of the statute (Recommended Determination, Conclusion of Law 3). We disagree with the presiding officer's conclusion and have dismissed the 18 respondents

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1/ Dong Sung Chemical Ind. Co., Ltd.; Putt-R-Golf Inc.; Emix Co.; Gambles Import Corp.; Marlot Color & Chemical Co., Inc.; Seoul Chemical Company; Kimpo Chemical Company; S & Y Enterprises; Seh Bang America; Daiwa Seiko, Inc.; Chugai Boyeki America Corp.; Dunbar Customs Service; Kumho U.S.A. Inc.; Ajay Sports; Sportsotron Inc.; Midland International Corp.; Tracy International (New Jersey); and Daewoo International America Corp.

4. That the appropriate remedy for such violation is to direct that certain molded golf balls made in accordance with claim 1 of United States Letters Patent 3,313,545 be excluded from entry into the United States for the term of said patent;
5. That, after considering the effect of such exclusion upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, such articles should be excluded from entry; and
6. That the bond provided for in subsection (g)(3) of section 337 of the Tariff act of 1930 (19 U.S.C. 1337(g)(3)) is determined by the Commission to be in the amount of 80 percent of the value of the articles concerned, f.o.b. foreign port.

#### 1. Violation.

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During the time that this proceeding was before the presiding officer, it was characterized by virtual nonparticipation by all respondents. The presiding officer concluded in his recommended determination that the 18 respondents named in finding 33, 1/ from whom samples were not obtained and tested, should be included with the seven respondents who are in violation of the statute (Recommended Determination, Conclusion of Law 3). We disagree with the presiding officer's conclusion and have dismissed the 18 respondents

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from whom samples were not obtained and tested because complainant has failed to sustain its burden of coming forward with evidence to prove that the imported articles from these respondents infringe the patent in issue. 1/ 2/ We believe that complainant could have obtained samples of these 18 respondents' accused balls. Only testing actual samples proves infringement. (See finding 5 on page 7 of this determination and action). Since complainant failed to sustain its burden of introducing evidence to prove that there was infringement of its patent by these 18 respondents, we are unwilling to find them in violation of the statute. Nevertheless, the exclusion order, which we

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1/ Then Chairman Minchew and Commissioner Moore believe that the 18 respondents from whom samples were not obtained and tested should have been included in the list of respondents who are in violation of the statute. They agree with the presiding officer that the fact that no imported molded golf ball among the physical samples is significantly dissimilar to complainant's ball is persuasive that the respondents unrepresented among the samples were also importing infringing balls. In addition, none of these 18 respondents has contested the joint motion for summary determination or the recommended determination. Their failure to contest indicates acquiescence.

2/ Commissioners Alberger and Ablondi have decided to join Chairman Parker and Commissioner Bedell, and therefore to dismiss, the 18 respondents listed in footnote 1/ on page 8, notwithstanding their position in Welded Stainless Steel Pipe and Tube, USITC Pub. 863 (1978). In that case, a group of respondents contumaciously resisted discovery by leading the complainants and staff to believe that discovery would be forthcoming and then withdrawing from the case at a critical stage. From this conduct, we drew the inference (which was of different scope for each of us) in that case that this program of resisting discovery was so egregious as to indicate it was undertaken to cover up a violation. In this case, in contrast, while discovery has been withheld and that is reprehensible, the withholding has not been nearly so destructive nor was it undertaken, so far as anything in the record shows, with the purpose of destroying this investigation. Under these circumstances, we believe that the sanctions imposed by the presiding officer in this proceeding relating to the introduction of evidence were adequate and that the failure to make what we consider to be an adequate showing of violation even with the benefit of those evidentiary sanctions forces a negative result with respect to these 18 respondents.

have determined is the appropriate remedy in this case, is a remedy that will prevent any person, including the respondents who were dismissed from the investigation, from importing molded golf balls which infringe this patent.

2. The Public Interest and Bonding.

The factual situation in this case is similar to the recent determination in *Certain Display Devices for Photographs and the Like* Investigation No. 337-TA-30, issued January 12, 1978, where then Chairman Minchew and Commissioners Moore and Alberger stated in their opinion at page 11:

The entry of an exclusion order will not adversely affect the public interest. The two most significant interests to be balanced in this case are the protection of a valid U.S. patent as opposed to a possible increase in consumer pricing. . . . Moreover, consumer constraints prevent premium pricing. Plastic display devices are not essentials of life. If one is to abuse the patent monopoly granted one, a reduction in sales is sure to follow.

Similarly, molded golf balls are not essentials of life, and we do not believe that any public policy consideration other than a possible increase in consumer pricing is involved. Therefore, the Commission feels an exclusion order strikes the most appropriate balance between patent protection and consumer interests.

In view of the price difference between the imported infringing article and the domestic products, we determine that a bond in the amount of 80 percent of the value of the imported articles, f.o.b. foreign port, is warranted.

Commission Order

Accordingly, it is hereby ordered:

1. Hayakawa Rubber Co., Ltd., Eagle Enterprises Co., Ltd., John A. Elliot (Shamrock Golf Co.), Imperial Golf Sales Co., Fred Akel Company, Douglas, Ltd., Seibu Polymer Chemical Co., Ltd., Far East Honsha Co., Ltd., Li and Fung, Western Golf Supply, Daewoo International Co., Ltd. Dong Sung Chemical Ind. Co., Ltd., Putt-R-Golf Inc., Exim Co., Gambles Import Corp., Marlot Color & Chemical Co., Inc., Seoul Chemical Company, Kimpo Chemical Company, S & Y Enterprises, Seh Bang America, Daiwa Seiko, Inc., Chugai Boyeki America Corp., Dunbar Customs Service, Kumho U.S.A. Inc., Ajay Sports, Sportsotron Inc., Midland International Corp., Tracy International (New Jersey), and Daewoo International America Corp. are dismissed as respondents in the investigation;
2. That the joint motion for summary determination of complainant and the Commission investigative staff is granted to the extent that it is not inconsistent with the Commission determination (motion docket number 35-3);
3. That certain molded golf balls made in accordance with claim 1 of United States Letters Patent 3,313,545 are excluded from entry into the United States for the term of said patent except (1) as provided in paragraph 4 of this Order, infra, or (2) as such importation is licensed by the owner of U.S. Letters Patent 3,313,545;
4. That the articles ordered to be excluded from entry are entitled to entry into the United States under bond in the amount of 80 percent of the value of the articles, f.o.b. foreign port, from the day after the day this Order is received by the President pursuant to section 337(g) of the Tariff Act of 1930, as amended, until such time as the President notifies the Commission that he approves this action, or the President disapproves this action, but, in any event, not later than sixty (60) days after such day of receipt;
5. That this Order will be published in the Federal Register and served upon each party of record in this investigation and upon the U.S. Department of Health, Education & Welfare, the U.S. Department of Justice, the Federal Trade Commission, and the Secretary of the Treasury; and
6. That the United States International Trade Commission may amend this order at any time.





EXHIBIT A

U. S. DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office

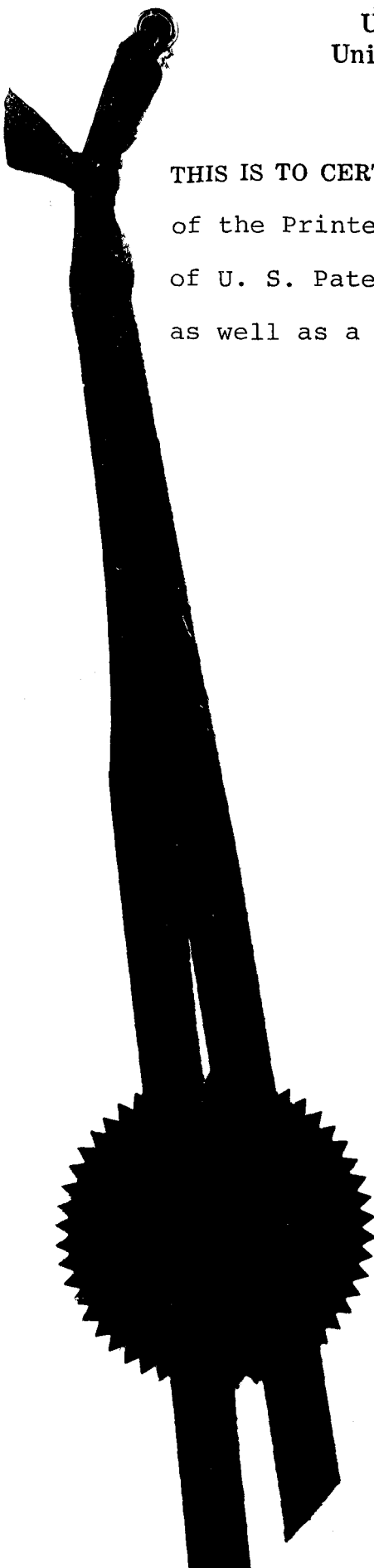
February 28, 1977  
(Date)

THIS IS TO CERTIFY that the annexed is a true copy from the records of this office of the Printed Specification and Drawings, at the time of issue, of U. S. Patent 3,313,545, entitled Unitary Molded Golf Ball, as well as a Certificate of Correction dated October 10, 1967.

By authority of the  
COMMISSIONER OF PATENTS AND TRADEMARKS

*Mary C. Conlon*

*Certifying Officer.*



UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,313,545

April 11, 1967

James R. Bartsch

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 7, line 49, before "silicate" insert -- silica or --; line 50, for "elastomer filler" read -- elastomer of filler --; line 74, for "curring" read -- curing --; column 9, line 22, after "cross-link" insert a hyphen --; line 49, for "320-250" read --230-250 --.

Signed and sealed this 10th day of October 1967.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents

APPENDIX

U.S. Letters Patent 3,313,545



1

2

3,313,545

## UNITARY MOLDED GOLF BALL

James R. Bartsch, Lebanon, N.J., assignor to PCR Patent Development Corporation, Princeton, N.J., a corporation of Delaware

Filed Sept. 12, 1963, Ser. No. 308,360

16 Claims. (Cl. 273-218)

This invention relates to a novel molded golf ball and is a continuation-in-part of my co-pending application Ser. No. 252,588 filed Jan. 21, 1963, and now abandoned. The invention more particularly relates to a molded golf ball having all of the desirable characteristics of the best conventionally wound golf balls while avoiding many of the disadvantages of the wound balls.

Golf balls have evolved from their early form which simply consisted of a stuffed cover to a highly sophisticated article which must have many very precise characteristics in order to satisfy players and be acceptable for tournament use. The only golf balls which have thus far been found acceptable for these purposes are wound balls which are made by winding a tensioned rubber thread about a suitable core, covering the wound article with a tough cover, such as of gutta-percha compounds or the like and finally painting the covered ball.

In order to comply with the rules of the game, as for example as set forth by the United States Golf Association (U.S.G.A.), golf balls must be greater than 1.680" in diameter, must weigh less than 1.620 ounces and cannot have an initial velocity of more than 255 feet per second as measured on a standard U.S.G.A. golf ball testing machine. In addition to these required characteristics, the balls must be as near to round as possible, and retain this roundness even after use, must be well balanced so that they fly and roll true and make a good sharp sound when struck by the golf club, generally referred to as "click" and be able to stand the rigors of play without adverse physical effect.

The characteristics of the wound ball may be controlled by suitable selection and control of the core, the winding tension and the cover. The manufacture of wound balls is, however, relatively expensive involving the fabrication of the core and the precise winding of the thread on the core by means of winding machinery which have limited capacity, the fabrication of the cover, and the application of the cover to the winding. The most expensive premium balls are generally so constructed that they have the highest initial velocity approaching the 255 feet per second limit. For this purpose, however, a very thin cover must be used due to its relatively lesser resilience and the same is very prone to cutting, when hit with the edge of a golf club which may render the ball no longer usable. Even the thicker covers on the sub-premium balls are prone to cutting and damage and are often rendered unsatisfactory for further use due to such cutting or damage.

Throughout the evolution of the golf ball, there have been many attempts and suggestions to produce golf balls by molding as, for example, from elastomers, such as vulcanized rubber. These attempts and suggestions have included completely molded balls and balls having molded interiors and provided with a separate cover. While it can be readily appreciated that a molded golf ball could be produced much more cheaply than a wound golf ball and could eliminate many of the disadvantages of a wound ball, nevertheless, and in spite of constant and continual efforts to produce a satisfactory molded ball, none have been successfully produced, and the only acceptable balls available are of the wound type.

It has never proven feasible nor possible to mold a golf ball from an elastomer which would have the required characteristics as set forth above. Ordinary elas-

tomers, such as rubber or the like, even when vulcanized do not have the characteristics to allow the production of a ball with sufficient hardness, compression, click, and the like. If it is attempted to increase the degree of hardness by increasing the cross-link density, caused by the vulcanization, as for example, with sulfur, the structure becomes too brittle and too inflexible and this cannot be remedied by the use of plasticizers, etc. Furthermore, in order to obtain the desired density, thick fillers and additives have to be used and all in all, it was simply not possible to obtain a ball of the required density which would still have the other necessary characteristics for a successful golf ball.

In accordance with the invention, I have surprisingly discovered that if an elastomer is cured in the presence of a relatively large amount of a monomer which is capable of acting as a cross-linking agent for the elastomer and under conditions which will additionally result in polymerization of the monomer, a structure is formed which consists of the elastomer cross-linked into a three dimensional network with a high density of long, flexible cross-links and that this structure is capable of being produced in the form of a molded golf ball having all of the required golf ball characteristics and yet overcoming the disadvantages of the wound balls.

In the accompanying drawing:

FIG. 1 shows a perspective view partially in section of a golf ball suitable for official play under the U.S.G.A. rules produced in accordance with the invention, and

FIG. 2 shows a perspective view partially in section of a range ball produced in accordance with the invention.

The ball as shown in FIG. 2 differs from that shown in FIG. 1 in that the elastomer of which it is composed contains sufficient white pigment, such as titanium dioxide, so that the ball is uniformly white throughout. With this white pigment the ball may be over weight and may not be as lively as desirable for official play, but is excellently suited for driving range use.

For the production of the homogeneous molded golf balls in accordance with the invention, the elastomer is cured while being molded under heat and pressure in the form of the golf ball in the presence of the monomer, a material promoting polymerization of the monomer, as for example a free radical type polymerization initiator, such as a peroxide catalyst and preferably a filler in order to adjust the ultimate density to the desired value.

As monomers which are capable of acting as cross-linking agents for elastomers will generally polymerize or cure per se into a hard, brittle form, it was completely unexpected that the curing of the monomer within the elastomer would result in a material having the necessary toughness, resilience, etc. for forming a satisfactory molded golf ball.

The elastomer is molded into the form of the golf ball, in intimate mixture with the monomer, and preferably a filler material, in the presence of a polymerization initiator for the monomer and under sufficient heat and pressure to cure the composition.

The elastomer may be any elastomer which is capable of being cross-linked and is preferably a rubber such as a polymer, copolymer, or terpolymer of butadiene, isoprene, or chloroprene. Most preferably the elastomer is a cis-butadiene rubber containing at least 40% cis. Examples of other elastomers include chlorinated and sulfochlorinated polyethylenes, amorphous polyolefins, such as polyethylene and polypropylene copolymers and terpolymers with unsaturated monomers; silicone rubbers; polypropylene oxide elastomers; butyl rubber; polysulfides; acetaldehyde copolymers; urethane elastomers; ethylene-vinyl acetate copolymers; styrene copolymers with acrylic and methacrylic esters of alcohols containing

at least four carbon atoms and the like. The elastomers should initially have a sufficient molecular weight to constitute a solid or at least viscous liquid.

The monomer may be any monomer which is capable of cross-linking the elastomer and undergoing further polymerization. In order to serve as cross-linking agents, the monomers generally must be in the form of difunctional compounds, i.e. compounds having two readily polymerizing groups or sites. The term "monomer" as used herein is used in its broadest sense and is not restricted to monomeric units but includes partial polymers capable of further polymerization. Examples of these monomers which are referred to herein and in the claims as cross-linking monomers include: vinyl, allyl, methallyl, furfuryl, crotyl and cinnamyl esters of the following acids: oxalic, malonic, succinic, glutaric, adipic, pimelic, suberic, azelaic, sebacic, maleic, itaconic, citraconic, mesaconic, fumaric, aconitic, phthalic, isophthalic, terephthalic, naphthalene dicarboxylic, mellitic, pyromellitic, trimesic, acrylic, methacrylic, cinnamic, and crotonic. Also suitable are polyamine amides and imides of the following acids: maleic, itaconic, acrylic, methacrylic, crotonic, citraconic, aconitic and cinnamic; polyol esters and anhydrides of acrylic, methacrylic, crotonic and cinnamic acids. Other suitable materials include di- and triallyl cyanurate; di- and triallyl melamine, divinyl benzene; diallyl benzene; diallyl amine; allyl ether; allyl glycolates; di-, tri and tetra vinyl and allyl silanes. Still further suitable materials are low molecular weight reactive polymers such as polymers of butadiene, isoprene, chloroprene and epoxidized derivatives of these materials. The diacrylates and dimethacrylates, as for example butylene glycol dimethacrylate, have proven preferable though divinyl compounds, such as divinyl benzene have also proven highly suitable.

In order to vary the density so that the finished ball will have the desired weight and will not exceed the maximum allowable weight, a filler may be required which may also serve to reinforce the composition. Any known or conventional filler may be used which should be in finely divided form, as for example in a form between about +20 and -325 and preferably +60 and -325 mesh U.S. Standard screen size. Most preferably the filler material is in the form of a silica or silicate as fillers in this form actually act as an adjunct to the cross-linking and thus aid the same and become a more integral part of the composition additionally and a minor amount of cork should preferably be used. In addition to the silica and silicate fillers, such as finely divided porous  $\text{SiO}_2$ , alkali metal silicates, such as calcium silicate, and the like, and other fillers in addition or in place of the silica, or silicates, such as carbon black, cork, titania, cotton flock, cellulose flock, leather fibre, plastic fibre, plastic flour, leather flour, fibrous fillers, such as asbestos, glass, and synthetic fibers, metal oxides, carbonates, and talc can be used.

The polymerization initiator may be any known or conventional initiator capable of causing the cross-linking monomer to further polymerize and cross-link. Generally, these initiators are of the free radical type, such as a peroxide, persulfate, azo compounds hydrozines, amine oxides, ionizing radiation and the like. Peroxides, such as dicumyl peroxide and other commercially available peroxides conventionally used as polymerization catalysts may be most conveniently used.

The amount of the cross-linking monomer must be at least 25% by weight of the elastomer in order to obtain the necessary degree of cross-linking to form the required three dimensional molecular network and to give the ball its characteristics. Amounts of the cross-linking polymer, as high as 90% by weight of the elastomer, may be used but amounts between about 40 and 75% by weight of the elastomer are preferred.

The amount of the filler material is dictated by its type and the type of the other constituents in order to obtain the required density and may vary between about

20 and 90% by weight of the elastomer, and preferably 30 and 70% of the elastomer.

The polymerization initiator need only be present in the catalytic amount required for this function and may be in general used in the amounts that the particular agent is generally used as a polymerization catalyst. In connection with peroxides, the same, for example, may be used in amounts of about 0.2-10% by weight of the elastomer.

When using the preferred components, the best results are obtained with compositions having 100 parts by weight of the cis-butadiene rubber and approximately 40-70 parts by weight of the methacrylate ester and 20-60 parts by weight fillers.

For the production of the golf balls, the ingredients should initially be intimately mixed using, for example, the usual rubber mixing rolls or a Banbury mixer until the composition is reasonably uniform. The mixing is basically done in a manner which is common in the elastomer art and there is practically no danger of over-mixing. The temperature of the mixing is not critical but should, of course, be below curing temperature, and the same is generally effected at room temperature though through friction the ingredients may be slightly warmed. This again follows rubber milling practice and involves no new technique, the heating up being relatively low.

The molding is effected in mating precision hemisphere molds or dies whose molding surface is covered with multiple regular projections to give the molded ball conventional dimpled or waffled surface appearance in order to improve its aero-dynamic characteristics. The molding is a simple, straight-forward operation effected in the conventional manner used in precision molding. The material, after being thoroughly mixed may be formed into slugs in the customary manner and the slugs which may be cylindrical or any other desired shape which will facilitate the insertion in the mold should be proportioned so that the mold is fully filled. The mating halves of the mold are then closed so that the mold cavity is entirely filled. The mold halves may be held together with pressures between about 100 and 3,000 p.s.i. preferably 1000 to 2000 p.s.i. The actual pressure actually exerted on the material being molded during the molding is probably between about 50 and 1,000 and preferably 100 and 500 p.s.i. Molding temperatures may vary depending on the particular composition used and may, for example, vary between 200-400° F. When utilizing the preferred compositions, the temperature preferably should not be below about 290° F. Optimum results are obtained in the neighborhood of 300° F. with a molding time of about 10 minutes. The molding should be effected until the composition is substantially completely cured, and there is no real upper limitation on the length of the curing time except as is dictated by practical considerations. In general, curing times between about 1 and 60 minutes, and preferably 4 and 30 minutes will generally suffice. Higher temperatures may be used up to about 400° F., but a problem arises. For optimum properties, the molded ball must be homogeneously cured, that is to say the heat must have reached the center of the ball before the outside layers become completely cured. With a cold mold, this presents no problem and temperatures may reach an end point as high as 400° F. However, normally in successive molding operations the mold is warm or hot when the next batch is molded, and in such cases, there is a tendency to over-cure the outer layers before the center of the ball is satisfactorily cured. As a practical matter, therefore, it is very difficult to mold optimum balls at temperatures above 320° F. Since, however, there is no advantage in high temperatures, it is preferred to operate at or near 300° F. with a molding time of approximately ten minutes at this temperature. The time is not critical but nothing is gained in longer times after the curing is complete.

After the molding, the balls are removed from the mold and any mold mark where the molds mate may be removed, as for example, by buffing, and the ball painted and marked, is then ready for marketing and use. Painting may be effected in the conventional manner using the conventional paints used for golf balls, as for example, enamel, polyurethane, epoxy, acrylic, or vinyl paints.

The size of the mold should be such that the finished balls have a diameter greater than 1.680" and is preferably between 1.680 and 1.685" in diameter. With this size the weight of the ball may be controlled so that it is less than 1.620 ounces and preferably between 1.600 and 1.620 ounces. The ball may be molded and will retain a roundness within .01" and preferably within .001". The density of the painted ball will be less than 1.13 and will be preferably between 1.11 and 1.12. The hardness of the ball as measured on a Shore hardness test will be greater than 75b and less than 99c, and will preferably be between 90-100b. The compression, as measured on a standard golf ball compression test machine will be between 40 and 150 points and preferably between 70 and 120 points. The balls will preferably bounce between about 60 and 75% of the height from which they are dropped in accordance with the Standard Bounce test,

The initial velocity of the balls, as tested on a standard U.S.G.A. test machine will be between 200 feet per second and 255 feet per second and preferably between about 230 and 250 feet per second. In actual play, however, due to internal dampening, the balls will appear livelier and may be driven further than conventionally wound balls which show a similar initial velocity.

The balls have all the desirable play characteristics of the best conventionally wound balls, have good click, excellent feel, and as contrasted to the covered wound balls, are so highly resistant to cutting that the same may practically be considered cut-proof, and indestructible in play. Furthermore, the balls will have a perfect center of gravity, excellent aerodynamic properties, superior roll, and even when severely distorted will return to round.

As contrasted to the conventionally covered wound balls, balls in accordance with the invention may be marked by simply stamping with a flat die, and are heat-resistant, solvent-resistant, abrasive-resistant, have an excellent shelf-life, will not water-log and have a superior texture and appearance. If the paint on the ball becomes worn or damaged, the balls may be very readily reclaimed by removing the old paint cover with grit-blasting, such as sand-blasting and repainting the same. In contrast, thereto, the conventional balls seldom last long enough to allow repainting.

The golf balls in accordance with the invention may be manufactured much more easily and cheaply than the conventional wound balls, and the required raw materials are readily available and relatively inexpensive.

Critical for the desired characteristics is the combination of the elastomer with the relatively large amount of the cross-linking monomer which polymerizes as it cross-links the elastomer forming the three dimensional network with the long, flexible cross-links. The combination of the elastomer with this monomer produces a synergistic effect since it yields a tough impact-resistant material having the desired and necessary characteristics, whereas either of these materials cured alone will not produce such a material.

The long, flexible cross-links thus formed will generally have a length of at least 10 carbon atoms and normally the length of the cross-links will be substantially in excess of this. Thus, for example, when using butylene-1,3-dimethacrylate a cross-link of 11 atoms minimum length is obtained, and the average length is a multiple of this value.

The following examples are given by way of illustration and not limitation:

### Example 1

A composition of 100 parts of predominantly cis butadiene polymer (62.5 parts of butyleneglycol dimethacrylate, 62.5 parts of a fine silica filler sold under the trade name of "Hysil," and 3.13 parts of dicumyl peroxide, are thoroughly mixed on rubber rolls at approximately room temperature, until the resulting material is completely homogeneous. The material is made up into cylindrical slugs of suitable weight, for example by extruding and cutting, which are filled into molds on a multiple molding press. Molding is effected at pressures from 125 to 300 p.s.i. at a mold temperature of 300° F. with a molding time of about 10 minutes.

The balls are removed from the mold, the thin fin or flash from the mold is buffed off, and the ball is then painted and marked.

The balls have the following characteristics:

Size	-----inches in diameter	1.680
Roundness	-----inches	.002
Hardness	-----	96b
Compression	-----	125
Initial velocity	-----	238±2

Their play characteristics may be considered at least equivalent to the conventional premium-quality wound balls, and they have excellent click and other playing characteristics. The balls are practically cut-free and indestructible and their resistance to extreme stresses is shown by clamping the ball and a premium-wound ball in a vise and applying pressure until the wound ball explodes and removing the molded golf ball. It is slightly out of shape but in a few moments resumes its normal round shape.

### Example 2

A composition of 100 parts of cis butadiene, 62.5 parts of divinyl benzene, 62.5 parts of fine silica of a particle size between .01 and 0.1 micron and 3.13 parts of dicumyl peroxide, are thoroughly mixed on rubber rolls at approximately room temperature until the composition is completely homogeneous. The material is made up into cylindrical slugs and placed in molds. Molding is effected at pressures from 125 to 130 p.s.i. at a mold temperature of 300° F. with a molding time of about 10 minutes. The balls are removed from the mold, the thin fin is buffed off and the balls are then painted white. The golf balls produced were of excellent quality, having the following characteristics:

Size	-----inches in diameter	1.681
Weight	-----oz.	1.610
Roundness	-----inches	.002
Density	-----	1.12
Hardness	-----	94b
Compression	-----	103
Initial velocity	-----	238±2

### Example 3

A composition of 100 parts by weight of cis polybutadiene, 56.2 parts by weight of butylene glycol dimethacrylate, 37.5 parts by weight of fine silica sold under the trade name "Hysil," 6.2 parts by weight of cork having a particle size below 60 mesh, and 3.13 parts by weight of dicumyl peroxide, are thoroughly mixed on rubber rolls at approximately room temperature until the resulting mixture is homogeneous. The material is made up into cylindrical slugs and molded, in the identical manner described in Example 1, into golf balls. The balls produced have the following characteristics:

Size	-----inches in diameter	1.680
Weight	-----oz.	1.58
Compression	-----	85
Hardness	-----	93b
Initial velocity	-----	238±2

If the balls are made up in the identical manner except,

however, using 12.5 parts of the cork, then the compression increases to 95 and the hardness to 95b.

#### Example 4

The examples may be repeated using cis polyisoprene, SBR rubber, butadiene-acrylonitrile copolymer, butyl rubber, ethylene-propylene-diene terpolymer, in place of the cis butadiene; divinyl adipate, methylene-bis-acrylamide, dialkyl phthalate, ethylene glycol-diacrylate, divinyl terephthalate in place of the polybutylene glycol dimethacrylate or divinyl benzene; calcium silicate, aluminum silicate, calcium carbonate, carbon black in place of the silica; and t-butyl peroxide, cumene hydroperoxide, benzoyl peroxide, perbenzoic acid, azo bis-isobutyronitrile, t-butyl perbenzoate, in place of the dicumyl peroxide, and in each case golf balls of excellent quality, meeting the requirements of the U.S.G.A. will be produced.

I have furthermore discovered that if the procedure described above is followed, but if a white pigment is incorporated in the mixture prior to molding, a golf ball is obtained which is excellently suited for use by golf driving ranges, i.e. practice ranges. The ball is heavier and is generally officially over-weight and is generally not as lively and does not have the initial velocity usually desired by players in ordinary and tournament play. Both these characteristics, however, enhance its desirability for driving range use. Furthermore, and of prime importance, the ball is perfectly white throughout and does not have to be painted. While it does not have as high a gloss as does a painted golf ball, its whiteness is permanent and its appearance is entirely adequate and the elimination of the need for painting further reduces driving range operational costs.

As a white pigment titanium dioxide is preferred but other white pigments, such as barium sulfate, zinc sulfide, barium carbonate, lithopone, titanium with barium base, titanium with calcium base, titanium with aluminum silicate, white lead, calcium carbonate, aluminum oxide may be used.

The amount of the white pigment should be sufficient to give the molded ball the desired white appearance, and in general amounts of 2 to 40% and preferably 5 to 10% of the total ball should be used.

The white pigment may be used in place of part or all of the filler material, such as the silica or silicate but is most preferably used in addition to a filler, such as the silicate. The ball should preferably contain about 25 to 75% by weight of the elastomer filler of which 4 to 100% and preferably 12 to 50% is in the form of the white pigments, such as the titanium dioxide.

In all other respects the driving range balls are produced in the identical manner as described for the golf balls above and have the same rugged and durable characteristics.

The following examples are given by way of illustration and not limitation of the driving range golf balls:

#### Example 5

A mixture is prepared with 2.5 pounds of a mixture of 50% cis butadiene and 50% butadiene-styrene copolymer, 8 ounces of the dimethacrylate of Example 1, 4 ounces of titanium dioxide and 8 ounces of the "Hysil" silica filler powder. The amount of dicumyl peroxide curing agent was 2 ounces. When molded, the ball was white with a hardness of about 80b. It is not satisfactory for tournament play, but is a useful ball for driving range use with a good click and a good feel.

#### Example 6

A mixture was made up of 16 ounce parts of cis butadiene polymer, 8.5 ounce parts of butyleneglycol dimethacrylate 8.5 ounce parts of "Hysil" silica, 1.5 ounce parts of titanium dioxide and 0.5 ounce parts of dicumyl peroxide curing agent. Molding was effected at 300° F. for about 10 minutes under a pressure of 185 p.s.i. A white

ball was produced having good bounce and good click, excellently suited for driving range use.

#### Example 7

The procedure of Example 6 was followed, but the amount of titanium dioxide was reduced to 1 part. Molding was at 195 p.s.i. under the same conditions and balls were obtained with good bounce and click, having a hardness of 100 and a compression of 90.

All of the balls made in Examples 5 to 7 were white and could be used for driving range purposes without painting. The balls from all examples exhibit a slight sweetish odor, which to many people is not unpleasant and which is practically unnoticeable with painted balls. However, if it is desired a small amount of an odorant such as isobornyl acetate can be added.

While the invention has been described in detail with reference to certain specific embodiments, various changes and modifications which fall within the spirit of the invention and scope of the appended claims will become apparent to the skilled artisan. The invention, therefore, is only intended to be limited by the claims or their equivalents wherein I have endeavored to claim all inherent novelty.

What is claimed is:

1. A homogeneous molded golf ball of high durability and good click having the following specifications:

Weight	-----oz.	1.500-1.620
Specific gravity	-----	1.04-1.12
Hardness (Shore)	-----	75-99c
Compression	-----	40-150
Initial velocity (U.S.G.A.)	-----ft./sec.	200-250
Size:	sphere of 1.68-1.69" in diameter.	

predominately composed of a filled elastomer highly cross-linked into a three dimension network with long, flexible cross links formed from a polymerized cross-linking monomer, said elastomer being one capable of being so cross-linked by said cross-linking monomer.

2. A golf ball of size, spherical shape and weight to comply with the standard rules for golfing, having a maximum diameter of about 1.69" predominately composed of a filled elastomer highly cross-linked into a three dimensional network with long, flexible cross links formed from about 25-90% by weight based on the elastomer of a polymerized cross-linking monomer, said elastomer being one capable of being so cross-linked by said cross-linking monomer, said filler being present in amount ranging between about 20 and 90% by weight of said elastomer.

3. A golf ball of size, spherical shape and weight to comply with the standard rules for golfing, having a maximum diameter of about 1.69" predominately composed of a filled rubber elastomer highly cross-linked by about 40-75% by weight of a cross-linking monomer into a three dimensional network with long, flexible cross-links of a length of at least 10 atoms, said elastomer being one capable of being so cross-linked by said cross-linking monomer, said filler being present in amount ranging between about 20 and 90% by weight of said elastomer.

4. A homogeneous molded golf ball of high durability and good click acceptable for official play under the U.S.G.A. rules and having the following specifications:

Weight	-----oz.	1.600-1.620
Specific gravity	-----	1.11-1.12
Hardness (Shore)	-----	90-100b
Compression range	-----	70-120
Initial velocity (U.S.G.A.)	-----ft./sec.	230-250
Size:	sphere of 1.680-1.685" in diameter.	

and predominately composed of a filled elastomer highly cross-linked into a three-dimensional network with long, flexible cross-links having a size of at least 10 carbon atoms formed from a polymerized cross-linking monomer, said elastomer being one capable of being so cross-linked by said cross-linking monomer.



5. A golf ball of spherical shape having a maximum diameter of about 1.69", of high durability and good click predominately composed of a filled diene-rubber cross-linked with about 25-90% by weight of a cross-linking monomer for said rubber into a three dimensional network with long, flexible cross-links having a length of at least 10 carbon atoms, said diene-rubber being one capable of being so cross-linked by said cross-linking monomer, said filler being present in amount ranging between about 20 and 90% by weight of said rubber.

6. A golf ball according to claim 5 in which the diene-rubber is cross-linked with a cross-linking monomer selected from the group consisting of dimethacrylate esters and divinyl compounds.

7. A golf ball according to claim 6 containing a filler which is a member selected from the group consisting of silica and silicates.

8. A homogeneous molded golf ball of high durability and good click having a standard spherical shape of a maximum diameter of about 1.69" predominately composed of a diene elastomer highly cross-linked with about 25-90% by weight of a dimethacrylate ester cross-linking monomer into a three dimensional network with long, flexible cross links and filled with about 25-90% by weight of a finely divided filler, the principal constituent of which is finely divided silica, said elastomer being one capable of being so cross-linked by said cross-linking monomer.

9. A golf ball according to claim 8 in which the said dimethacrylate ester is a glycol dimethacrylate.

10. A golf ball according to claim 9 in which said glycol dimethacrylate is butylene glycol dimethacrylate.

11. A homogeneous molded golf ball of high durability and good click having a standard spherical shape of maximum diameter of about 1.69" predominately composed of a cis butadiene elastomer highly cross-linked into a three dimensional network with long, flexible cross links by 25-90% by weight of a member selected from the group consisting of butylene glycol dimethacrylate and divinyl benzene and containing about 50-70 parts by weight of finely divided silica filler.

12. A homogeneous molded golf ball of high durability and good click acceptable for official play under the U.S.G.A. rules and having the following specifications:

Weight	oz.	1.600-1.620
Specific gravity		1.11-1.12
Hardness (Shore)		90-100b
Compression range		40-120
Initial velocity (U.S.G.A.)	ft. sec.	320-250
Size: sphere of 1.680-1.685" in diameter.		

and predominately composed of cis butadiene rubber highly cross linked into a three dimensional network with long, flexible cross links by about 56% by weight of butylene glycol dimethacrylate and filled with 37% by weight of finely divided silica and about 6 to 12% of cork.

13. A homogeneous molded golf ball for driving range

use comprising a molded sphere of the size and shape of a golf ball predominately composed of a filled elastomer highly cross-linked into a three dimensional network with long, flexible cross links formed from about 25 to 90% by weight based on said elastomer of a polymerized cross-linking monomer, said filler being present in amount ranging between about 20-90% by weight of said elastomer, said elastomer being one capable of being so cross-linked by said cross-linking monomer and containing sufficient white pigment so that the ball is uniformly white throughout.

14. A golf ball for driving range use according to claim 13 in which said elastomer is a diene elastomer cross-linked into said three dimensional network with about 40-90% by weight of a cross-linking agent selected from the group consisting of dimethacrylate esters, and divinyl compound.

15. A golf ball for driving range use according to claim 13 in which said pigment is titanium dioxide present in amount of 2 to 40% by weight.

16. A highly durable homogeneous molded golf ball for driving range use comprising a molded sphere of the size and shape of a golf ball predominately composed of a silica filled butadiene elastomer highly cross-linked into a three dimensional network with long, flexible cross-links by about 25-90% by weight of a cross-linking monomer selected from the group consisting of dimethacrylate esters and divinyl compounds, and containing from 5 to 10% by weight of titanium dioxide to give the same a uniform white color throughout, said elastomer containing a total amount of filler and titanium dioxide of about 20-90% by weight.

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MORRIS IEBMAN, Primary Examiner.

DELBERT B. LOWE, Examiner.

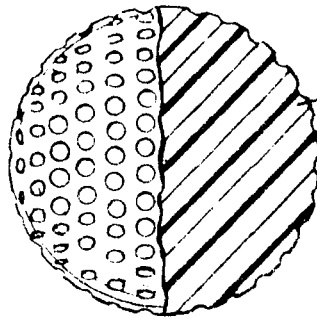
G. J. MARIO, A. LIEBERMAN, Assistant Examiners.

April 11, 1967

J. R. BARTSCH  
UNITARY MOLDED GOLF BALL  
Filed Sept. 12, 1963

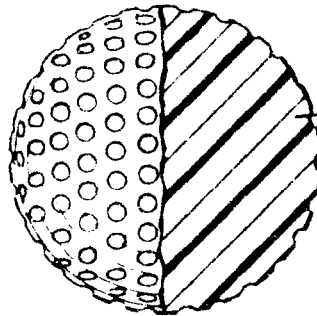
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FIG. 1.



HOMOGENEOUS MOLDED GOLF  
BALL SUITABLE FOR OFFICIAL  
PLAY.

FIG. 2.



RANGE BALL  
(WHITE THROUGHOUT)

INVENTOR  
JAMES R. BARTSCH  
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ATTORNEYS.

Library Cataloging Data

U.S. International Trade Commission

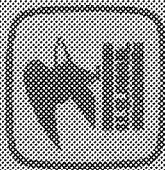
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