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Attorneys for Plaintiff

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

AMERICAN SAFETY RAZOR CO., 240 Cedar Knolls Road, Cedar Knolls, New Jersey 07927, Plaintiff, v. SORENSEN RESEARCH & DEVELOPMENT TRUST, 9930 Mesa Rim Road, Suite 200, San Diego, California 92121, Defendant.	Case No. _____ COMPLAINT FOR DECLARATORY JUDGMENT & DEMAND FOR JURY TRIAL

Plaintiff AMERICAN SAFETY RAZOR CO., ("American Safety Razor"), for its Complaint against Defendant SORENSEN RESEARCH & DEVELOPMENT TRUST ("Sorensen"), alleges as follows:

NATURE OF ACTION

1. This is an action for Declaratory Judgment and other relief brought under the Federal Declaratory Judgment Act, 28 U.S.C. §§ 2201–02.

PARTIES

2. American Safety Razor is a corporation organized and existing under the laws of the State of Delaware, having a principal place of business at 240 Cedar Knolls Road Cedar Knolls, New Jersey 07927 and is doing business in this District.

3. On information and belief, Sorensen is a trust entity organized, administered, and existing under the laws of California, having a principal place of business at the offices of its attorneys, 9930 Mesa Rim Road, Suite 200, San Diego, California 92121.

4. On information and belief, Sorensen is in the business of acquiring and holding patents on inventions, including those purportedly invented by Mr. Jens O. Sorensen, and seeking licenses for such patents.

JURISDICTION AND VENUE

5. This Court has jurisdiction over the subject matter of this action on the following grounds:

(a) 28 U.S.C. § 1331, this being a civil action arising under the laws of the United States;

(b) 28 U.S.C. § 1337(a), this being a civil action arising under an Act of Congress regulating commerce and protecting trade and commerce;

(c) 28 U.S.C. § 1338(a), this being a civil action arising under an Act of Congress relating to alleged patent rights; and

(d) 28 U.S.C. § 1332, this being a civil action between citizens of different states in which the alleged amount in controversy exceeds seventy-five thousand dollars ($75,000.00) exclusive of interest and costs.

6. This Court may declare the rights and other legal relations of the parties in this case under 28 U.S.C. § 2201 and Federal Rule of Civil Procedure 57 because an actual and justiciable controversy exists concerning the rights of, and legal relations between, American Safety Razor and Sorensen.

7. This Court has personal jurisdiction over Sorensen consistent with the principles underlying the U.S. Constitution and the District of Columbia long-arm statute because, among other things, any injury caused to American Safety Razor occurred in the District of Columbia as a result of Sorensen's actions.

8. Sorensen sent letters threatening American Safety Razor with possible litigation, thus creating a reasonable apprehension of suit by Sorensen against American Safety Razor.

9. Sorensen is doing business in this District for a number of reasons, including but not limited to conducting its business of seeking patent licenses with entities (including with American Safety Razor through repeated correspondence and negotiations with counsel for American Safety Razor based in Washington, D.C. spanning multiple years) relating to U.S. Patent No. 4,935,184 ("the '184 patent"); commencing and engaging in litigation in courts and tribunals in this District relating to the '184 patent; appearing in the District with respect to litigation in this District relating to the '184 patent; entering into contracts with those in the District in furtherance of litigation relating to the '184 patent; relying upon affidavits signed and notarized in this District in furtherance of litigation relating to the '184 patent.

10. On or about December 1, 2003 Sorensen instituted an action as a complainant before the United States International Trade Commission, Investigation No. 337-TA-502 relating to the '184 patent ("ITC Action").

11. During the ITC Action, Sorensen had three attorneys appear on its behalf—Boris Zelkind, Patricia Shackelford, and Michael Kaler.

12. In the ITC Action, J. Ole Sorensen and Jens E. Sorensen also entered personal appearances.

13. The ITC Action resulted in a finding of no infringement of the '184 patent.

14. Sorensen appealed the finding of no infringement in the ITC Action to the United States Court of Appeals for the Federal Circuit ("Federal Circuit Appeal").

15. Upon information and belief, representatives of Sorensen (Jens E. Sorensen, J. Ole Sorensen, Boris Zelkind, Patricia Shackelford, and/or Michael Kaler) appeared in this District in relation to the Federal Circuit Appeal.

16. Upon information and belief, representatives of Sorensen (Jens E. Sorensen, J. Ole Sorensen, Boris Zelkind, Patricia Shackelford, and/or Michael Kaler) were present in this District in or around August 4, 2005 in relation to oral argument related to the Federal Circuit Appeal.

17. Sorensen has litigated the '184 patent in the District of New Jersey ("New Jersey Action").

18. The New Jersey Action involved Sorensen's allegations of patent infringement relating to the '184 patent.

19. In the New Jersey Action, Sorensen filed with the court the declaration of Herman-Josef Hartman ("Hartman Declaration") in support of its motion for summary judgment of infringement of the '184 patent.

20. The Hartman Declaration was filed with the court in both German and English.

21. Lauren Crank, based at 1001 Pennsylvania Ave., NW, Washington, D.C. 20004, performed the German to English translation of the Hartman Declaration.

22. Lauren Crank submitted an "Affidavit of Accuracy" relating to the Hartman Declaration, which was notarized by Lisa Sherfinski, Notary Public, District of Columbia on November 17, 2003.

23. In the New Jersey Action, Sorensen filed with the court the declaration of Gerhard Dollinger ("Dollinger Declaration") in support of its motion for summary judgment of infringement of the '184 patent.

24. The Dollinger Declaration was filed with the court in both German and English.

25. Lauren Crank, based at 1001 Pennsylvania Ave., NW, Washington, D.C. 20004, performed the German to English translation of the Dollinger Declaration.

26. Lauren Crank submitted an "Affidavit of Accuracy" relating to the Dollinger Declaration, which was notarized by Lisa Sherfinski, Notary Public, District of Columbia on November 14, 2003.

27. Venue is proper in this Court under the provisions of 28 U.S.C. §§ 1391 and/or 1400 because, among other things, (a) this is an action arising out of allegations of patent infringement, (b) American Safety Razor, through its counsel, is present in this District, (c) a substantial part of the events giving rise to American Safety Razor's claims occurred in this

District, and (d) on information and believe, Sorensen is subject to personal jurisdiction in this District.

FACTUAL ALLEGATIONS

28. American Safety Razor incorporates by reference paragraphs 1 through 27 above as if set forth fully herein.

29. Sorensen has alleged that it owns whatever rights may exist the '184 patent, entitled "Stabilized Injection Molding When Using a Common Mold Part With Separate Complementary Mold Parts", which issued on June 19, 1990. A copy of the '184 patent is attached hereto as Exhibit 1.

30. In a letter dated April 16, 2005 ("the April 16 letter") addressed to the Chief Executive Officer of American Safety Razor Company in Cedar Knolls, New Jersey, Sorensen alleged that a number of American Safety Razor's products infringed the '184 Patent because they were "substantially likely to have been fabricated utilizing a process that infringes the ['184 patent] ....."

31. In the April 16 letter, Sorensen specifically alleged the "Personna Tri-Flexxx For Women" ("the Accused Product") infringed the '184 Patent.

32. In the April 16 letter, Sorensen further stated that American Safety Razor "must obtain a license under the '184 patent in order to continue importing into, manufacturing, offering for sale and/or selling" the Accused Product within the United States.

33. In a letter dated June 8, 2005, and after a diligent and reasonable investigation into Sorensen's allegations, counsel for American Safety Razor located in Washington, D.C. responded to the allegations of infringement set forth in Sorensen's April 16 letter, explaining why the Accused Product did not infringe the '184 patent.

34. Alongside the June 15, 2005 letter, counsel for American Safety Razor forwarded pictures to Sorensen in a sealed envelope (attaching a Non-Disclosure Agreement) supporting its position that the Accused Product did not infringe the '184 patent.

35. In a letter dated June 27, 2005 sent to counsel for American Safety Razor based in Washington, D.C., Sorensen stated that it was not signing the Non-Disclosure Agreement and was returning the sealed envelop without opening it.

36. In a letter dated July 28, 2005, counsel for American Safety Razor set forth that it was enclosing, again, photographs in a sealed envelope as evidence of noninfringement, and again requested that Sorensen sign the attached Non-Disclosure Agreement.

37. In a letter dated August 11, 2005 to counsel for American Safety Razor based in Washington, D.C., Sorensen stated that it was, again, refusing to open the envelope containing American Safety Razor's photographs and refusing to sign the Non-Disclosure Agreement.

38. In its August 11, 2005 letter Sorensen requested American Safety Razor to provide additional information for "why we [Sorensen] should not immediately institute legal proceedings for infringement".

39. In a letter dated June 19, 2006 to counsel for American Safety Razor based in Washington, D.C., Sorensen continued to assert that the Accused Product infringed the '184 patent.

40. In its June 19, 2006 letter, Sorensen explained that it was attaching a declaration that was "intentionally broader in scope than the claims of the '184 patent".

41. In its June 19, 2006 letter, Sorensen demanded that an officer of American Safety Razor sign the declaration.

42. In its June 19, 2006 letter, Sorensen explained that it was also enclosing its standard licensing agreement.

43. In a letter dated December 20, 2006, counsel for American Safety Razor again refuted Sorensen's allegations of infringement and explained why the photographs of the actual molds used to fabricate the Accused Product support the veracity of American Safety Razor's statements related to the noninfringement of the Accused Product.

44. In a letter dated December 27, 2006 to counsel for American Safety Razor based in Washington, D.C., Sorensen again asserted its contentions of infringement and requested confirmation that counsel for American Safety Razor was "authorized to accept service of process on behalf of American Safety Razor."

45. In a letter dated April 4, 2007 to counsel for American Safety Razor based in Washington, D.C., Sorensen again stated it was providing a "**FINAL NOTICE**" (emphases in original) of infringement.

46. In its April 4, 2007 letter Sorenson asserted that "American Safety Razor's unlicensed usage of Sorensen Research & Development's intellectual property cannot be allowed to continue…."

47. In its April 4, 2007 letter Sorensen stated it "will begin preparing a Complaint".

48. In its April 4, 2007 letter Sorensen stated that unless American Safety Razor complied by "April 20", "American Safety Razor will find itself in litigation with Sorensen Research and Development."

49. American Safety Razor is entitled to a judgment declaring its rights as requested herein.

COUNT ONE

DECLARATORY JUDGMENT REGARDING
ALLEGATIONS OF PATENT INFRINGEMENT

50. American Safety Razor incorporates by reference paragraphs 1 through 49 above as if set forth fully herein.

51. There is an actual, substantial, and justiciable controversy between American Safety Razor and Sorensen concerning Sorensen's allegations that American Safety Razor has infringed the '184 patent.

52. Sorensen's allegations place a cloud over American Safety Razor's business activities and will cause uncertainty among customers, prospective customers, suppliers, and others in the marketplace, likely leading American Safety Razor to lose revenues and/or business opportunities.

53. The Accused Product and the fabrication process therefor do not infringe any rights of Sorensen in the '184 patent.

54. The Accused Product and the fabrication process therefor do not infringe any rights of Sorensen in the '184 patent because, *inter alia*, in the fabrication process for the Accused Product, there are no common mold parts used in the process.

55. American Safety Razor is entitled to a judgment declaring that the Accused Product and the fabrication process therefor do not infringe any rights of Sorensen in the '184 patent.

56. American Safety Razor is entitled to a judgment declaring that any and all making, using, selling, offering for sale, and/or importing into the United States of the Accused Product or any product made by the process used to fabricate the Accused Product, is and has

been lawful, and otherwise declaring that American Safety Razor has not infringed whatever rights, if any, Sorensen may hold in the '184 patent.

57. As a direct and proximate result of Sorensen's allegations of patent infringement, American Safety Razor is suffering irreparable harm to its reputation and goodwill in an amount that cannot presently be ascertained and cannot be compensated adequately by monetary relief alone.

WHEREFORE, American Safety Razor Industries, Inc., prays that this Court enter judgment:

(a) Declaring that American Safety Razor has not infringed any purported patent rights of Sorensen in the '184 patent, or otherwise violated any provision of the patent laws of the United States, in connection with the Accused Product, the fabrication process therefor, or any other product made using the fabrication process for the Accused Product that is made, used, imported, sold, and/or offered for sale by American Safety Razor, including but not limited to the Accused Product;

(b) Permanently enjoining Sorensen, its successors, assigns, and any other related persons and/or entities from asserting the '184 patent against American Safety Razor in connection with the Accused Product, the fabrication process therefor, or any other product made with the process used to fabricate the Accused Product that is made, used, imported, sold, and/or offered for sale by American Safety Razor or its related companies, including but not limited to the Accused Product;

(c) Finding in favor of American Safety Razor and declaring this case to be exceptional pursuant to 35 U.S.C. § 285;

(d) Awarding American Safety Razor its attorneys' fees and other costs and expenses;

(e) Awarding interest to American Safety Razor to the extent permitted by law; and

JURY DEMAND

American Safety Razor respectfully requests a trial by jury on all issues so triable.



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Facsimile: (202) 756-8087

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CIVIL COVER SHEET

JS-44
(Rev.1/05 DC)

I (a) PLAINTIFFS
American Safety Razor Company
88888

(b) COUNTY OF RESIDENCE OF FIRST LISTED PLAINTIFF (EXCEPT IN U.S. PLAINTIFF CASES) 88888

DEFENDANTS
Sorensen Research & Development Trust

COUNTY OF RESIDENCE OF FIRST LISTED DEFENDANT (IN U.S. PLAINTIFF CASES ONLY) 88888
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE TRACT OF LAND INVOLVED

(c) ATTORNEYS (FIRM NAME, ADDRESS, AND TELEPHONE NUMBER)
McDermott Will & Emery LLP
600 13th Street NW
Washington, DC 20005

JURY ACTION

Case: 1:07-cv-00730
Assigned To : Kennedy, Henry H.
Assign. Date : 4/20/2007
Description: AM. SAFETY RAZOR CO. V SORENSEN RESEARCH

II. BASIS OF JURISDICTION
(PLACE AN x IN ONE BOX ONLY)

- ○ 1 U.S. Government Plaintiff
- ◉ 3 Federal Question (U.S. Government Not a Party)
- ○ 2 U.S. Government Defendant
- ○ 4 Diversity (Indicate Citizenship of Parties in item III)

III CITIZENSHIP OF PRINCIPAL PARTIES (PLACE AN x IN ONE BOX FOR PLAINTIFF AND ONE BOX FOR DEFENDANT) FOR DIVERSITY CASES ONLY!

	PTF	DFT		PTF	DFT
Citizen of this State	○ 1	○ 1	Incorporated or Principal Place of Business in This State	○ 4	○ 4
Citizen of Another State	○ 2	○ 2	Incorporated and Principal Place of Business in Another State	○ 5	○ 5
Citizen or Subject of a Foreign Country	○ 3	○ 3	Foreign Nation	○ 6	○ 6

IV. CASE ASSIGNMENT AND NATURE OF SUIT
(Place a X in one category, A-N, that best represents your cause of action and one in a corresponding Nature of Suit)

○ A. *Antitrust*
- ☐ 410 Antitrust

○ B. *Personal Injury/ Malpractice*
- ☐ 310 Airplane
- ☐ 315 Airplane Product Liability
- ☐ 320 Assault, Libel & Slander
- ☐ 330 Federal Employers Liability
- ☐ 340 Marine
- ☐ 345 Marine Product Liability
- ☐ 350 Motor Vehicle
- ☐ 355 Motor Vehicle Product Liability
- ☐ 360 Other Personal Injury
- ☐ 362 Medical Malpractice
- ☐ 365 Product Liability
- ☐ 368 Asbestos Product Liability

○ C. *Administrative Agency Review*
- ☐ 151 Medicare Act

Social Security:
- ☐ 861 HIA ((1395ff)
- ☐ 862 Black Lung (923)
- ☐ 863 DIWC/DIWW (405(g)
- ☐ 864 SSID Title XVI
- ☐ 865 RSI (405(g)

Other Statutes
- ☐ 891 Agricultural Acts
- ☐ 892 Economic Stabilization Act
- ☐ 893 Environmental Matters
- ☐ 894 Energy Allocation Act
- ☐ 890 Other Statutory Actions (If Administrative Agency is Involved)

○ D. *Temporary Restraining Order/Preliminary Injunction*

Any nature of suit from any category may be selected for this category of case assignment.

(If Antitrust, then A governs)

◉ E. *General Civil (Other)* OR **○ F. *Pro Se General Civil***

Real Property
- ☐ 210 Land Condemnation
- ☐ 220 Foreclosure
- ☐ 230 Rent, Lease & Ejectment
- ☐ 240 Torts to Land
- ☐ 245 Tort Product Liability
- ☐ 290 All Other Real Property

Personal Property
- ☐ 370 Other Fraud
- ☐ 371 Truth in Lending
- ☐ 380 Other Personal Property Damage
- ☐ 385 Property Damage Product Liability

Bankruptcy
- ☐ 422 Appeal 28 USC 158
- ☐ 423 Withdrawal 28 USC 157

Prisoner Petitions
- ☐ 535 Death Penalty
- ☐ 540 Mandamus & Other
- ☐ 550 Civil Rights
- ☐ 555 Prison Condition

Property Rights
- ☐ 820 Copyrights
- ☒ 830 Patent
- ☐ 840 Trademark

Federal Tax Suits
- ☐ 870 Taxes (US plaintiff or defendant
- ☐ 871 IRS-Third Party 26 USC 7609

Forfeiture/Penalty
- ☐ 610 Agriculture
- ☐ 620 Other Food &Drug
- ☐ 625 Drug Related Seizure of Property 21 USC 881
- ☐ 630 Liquor Laws
- ☐ 640 RR & Truck
- ☐ 650 Airline Regs
- ☐ 660 Occupational Safety/Health
- ☐ 690 Other

Other Statutes
- ☐ 400 State Reapportionment
- ☐ 430 Banks & Banking
- ☐ 450 Commerce/ICC Rates/etc.
- ☐ 460 Deportation
- ☐ 470 Racketeer Influenced & Corrupt Organizations
- ☐ 480 Consumer Credit
- ☐ 490 Cable/Satellite TV
- ☐ 810 Selective Service
- ☐ 850 Securities/Commodities/ Exchange
- ☐ 875 Customer Challenge 12 USC 3410
- ☐ 900 Appeal of fee determination under equal access to Justice
- ☐ 950 Constitutionality of State Statutes
- ☐ 890 Other Statutory Actions (if not administrative agency review or Privacy Act

— 0 —

○ G. *Habeas Corpus/ 2255* ☐ 530 Habeas Corpus-General ☐ 510 Motion/Vacate Sentence	○ H. *Employment Discrimination* ☐ 442 Civil Rights-Employment (criteria: race, gender/sex, national origin, discrimination, disability age, religion, retaliation) *(If pro se, select this deck)*	○ I. *FOIA/PRIVACY ACT* ☐ 895 Freedom of Information Act ☐ 890 Other Statutory Actions (if Privacy Act) *(If pro se, select this deck)*	○ J. *Student Loan* ☐ 152 Recovery of Defaulted Student Loans (excluding veterans)
○ K. *Labor/ERISA (non-employment)* ☐ 710 Fair Labor Standards Act ☐ 720 Labor/Mgmt. Relations ☐ 730 Labor/Mgmt. Reporting & Disclosure Act ☐ 740 Labor Railway Act ☐ 790 Other Labor Litigation ☐ 791 Empl. Ret. Inc. Security Act	○ L. *Other Civil Rights (non-employment)* ☐ 441 Voting (if not Voting Rights Act) ☐ 443 Housing/Accommodations ☐ 444 Welfare ☐ 440 Other Civil Rights ☐ 445 American w/Disabilities-Employment ☐ 446 Americans w/Disabilities-Other	○ M. *Contract* ☐ 110 Insurance ☐ 120 Marine ☐ 130 Miller Act ☐ 140 Negotiable Instrument ☐ 150 Recovery of Overpayment & Enforcement of Judgment ☐ 153 Recovery of Overpayment of Veteran's Benefits ☐ 160 Stockholder's Suits ☐ 190 Other Contracts ☐ 195 Contract Product Liability ☐ 196 Franchise	○ N. *Three-Judge Court* ☐ 441 Civil Rights-Voting (if Voting Rights Act)

V. ORIGIN
(1) Original Proceeding ○ 2 Removed from State Court ○ 3 Remanded from Appellate Court ○ 4 Reinstated or Reopened ○ 5 Transferred from another district (specify) ○ 6 Multi district Litigation ○ 7 Appeal to District Judge from Mag. Judge

VI. CAUSE OF ACTION (CITE THE U.S. CIVIL STATUTE UNDER WHICH YOU ARE FILING AND WRITE A BRIEF STATEMENT OF CAUSE.)
28 U.S.C. §§1338(a), 2201: Declaratory judgment action (under 28 U.S.C. § 2201) of non-infringement of patent (under 28 U.S.C. §1338(a))

VII. REQUESTED IN COMPLAINT ☐ CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23 **DEMAND $** _____ Check YES only if demanded in complaint **JURY DEMAND:** YES [X] NO ☐

VIII. RELATED CASE(S) IF ANY (See instruction) YES ☐ NO [X] If yes, please complete related case form.

DATE April 20, 2007 **SIGNATURE OF ATTORNEY OF RECORD** EPule #490141

INSTRUCTIONS FOR COMPLETING CIVIL COVER SHEET JS-44
Authority for Civil Cover Sheet

The **JS-44** civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. Consequently a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed. Listed below are tips for completing the civil cover sheet. These tips coincide with the Roman Numerals on the Cover Sheet.

I. COUNTY OF RESIDENCE OF FIRST LISTED PLAINTIFF/DEFENDANT (b) County of residence: Use 11001 to indicate plaintiff is resident of Washington, D.C.; 88888 if plaintiff is resident of the United States but not of Washington, D.C., and 99999 if plaintiff is outside the United States.

III. CITIZENSHIP OF PRINCIPAL PARTIES: This section is completed only if diversity of citizenship was selected as the Basis of Jurisdiction under Section II.

IV. CASE ASSIGNMENT AND NATURE OF SUIT: The assignment of a judge to your case will depend on the category you select that best represents the primary cause of action found in your complaint. You may select only one category. You must also select one corresponding nature of suit found under the category of case.

VI. CAUSE OF ACTION: Cite the US Civil Statute under which you are filing and write a brief statement of the primary cause.

VIII. RELATED CASES, IF ANY: If you indicated that there is a related case, you must complete a related case form, which may be obtained from the Clerk's Office.

Because of the need for accurate and complete information, you should ensure the accuracy of the information provided prior to signing the form.

United States Patent [19]
Sorensen

[11] **Patent Number: 4,935,184**
[45] **Date of Patent: Jun. 19, 1990**

[54] **STABILIZED INJECTION MOLDING WHEN USING A COMMON MOLD PART WITH SEPARATE COMPLIMENTARY MOLD PARTS**

[75] Inventor: **Jens O. Sorensen**, Rancho Santa Fe, Calif.

[73] Assignee: **Primtec**, Rancho Santa Fe, Calif.

[21] Appl. No.: **386,012**

[22] Filed: **Jul. 27, 1989**

Related U.S. Application Data

[63] Continuation of Ser. No. 152,670, Feb. 5, 1988, abandoned.

[51] **Int. Cl.**[5] **B29C 45/16**
[52] **U.S. Cl.** **264/246**; 264/255; 264/328.8; 425/129.1
[58] **Field of Search** 264/245, 246, 255, 328.1, 264/328.8, 328.11, 328.12; 425/127, 129.1, 130

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,543,338	12/1970	Cooper	264/246
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3,832,110	8/1974	Hehl	425/130
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4,422,995	12/1983	Schad	425/129.1
4,459,256	7/1984	Ziegler	264/242
4,508,676	4/1985	Sorensen	264/328.8

FOREIGN PATENT DOCUMENTS

17577	1/1972	Australia .	

OTHER PUBLICATIONS

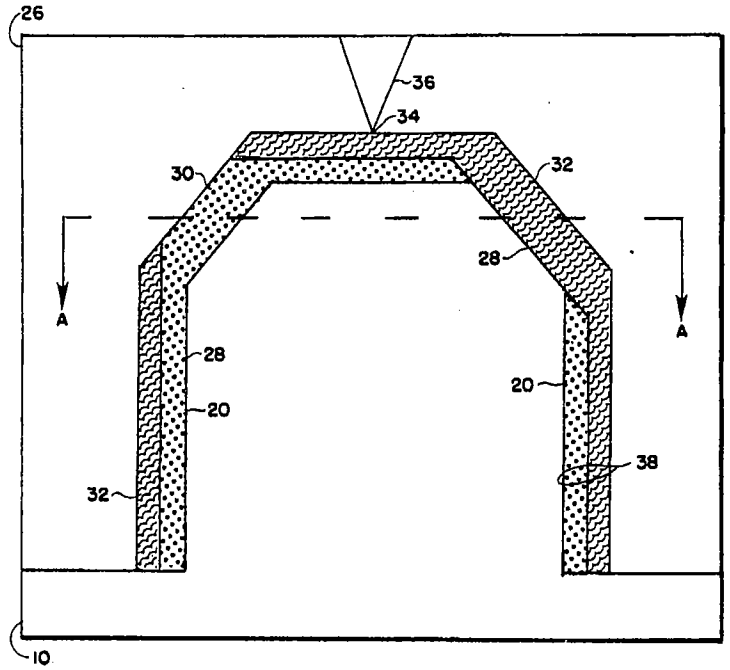
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Primary Examiner—Jill L. Heitbrink
Attorney, Agent, or Firm—Edward W. Callan

[57] **ABSTRACT**

A process for injection molding plastic products having a closed end and an open end with laminated walls terminating in a rim at the open end. A first common mold part is combined with a first complementary mold part to assemble a first mold cavity in which the first plastic material is injected until it reaches the portion of the first mold cavity that defines the rim of the product. Portions of the first complementary mold part contact portions of the first common mold part to rigidly secure the mold parts in position in relation to each other in order to impede movement of the mold parts in relation to each other during injection of a first plastic material into the first mold cavity. The first plastic material is shaped such that when it is contained after solidification in a second mold cavity it provides one or more stabilizing regions that rigidly secure the first common mold part in position in relation to the second complementary mold part in order to impede movement of such mold parts in relation to each other during the injection of a second plastic material into the second mold cavity. A second plastic material having different characteristics than the first plastic material is injected until it reaches the portion of the second mold cavity that defines the rim of the product to form a laminated wall.

10 Claims, 5 Drawing Sheets



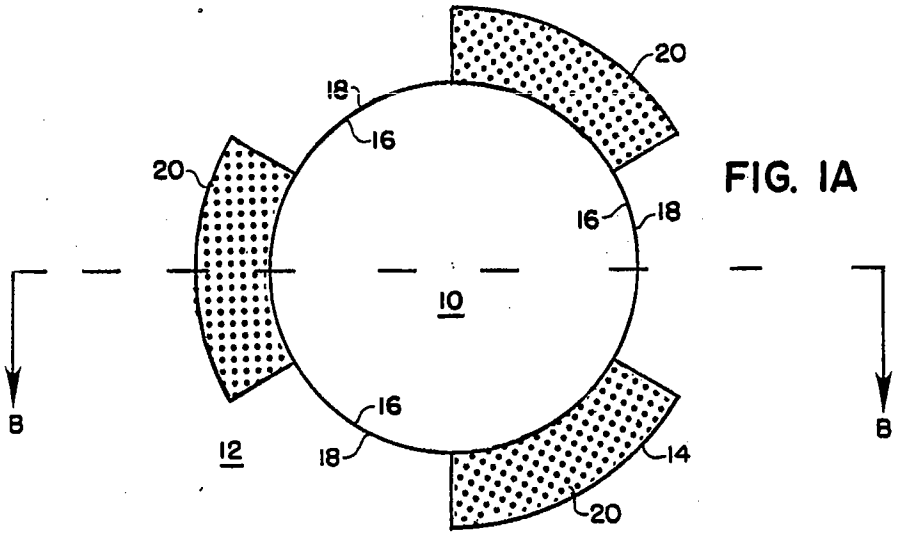
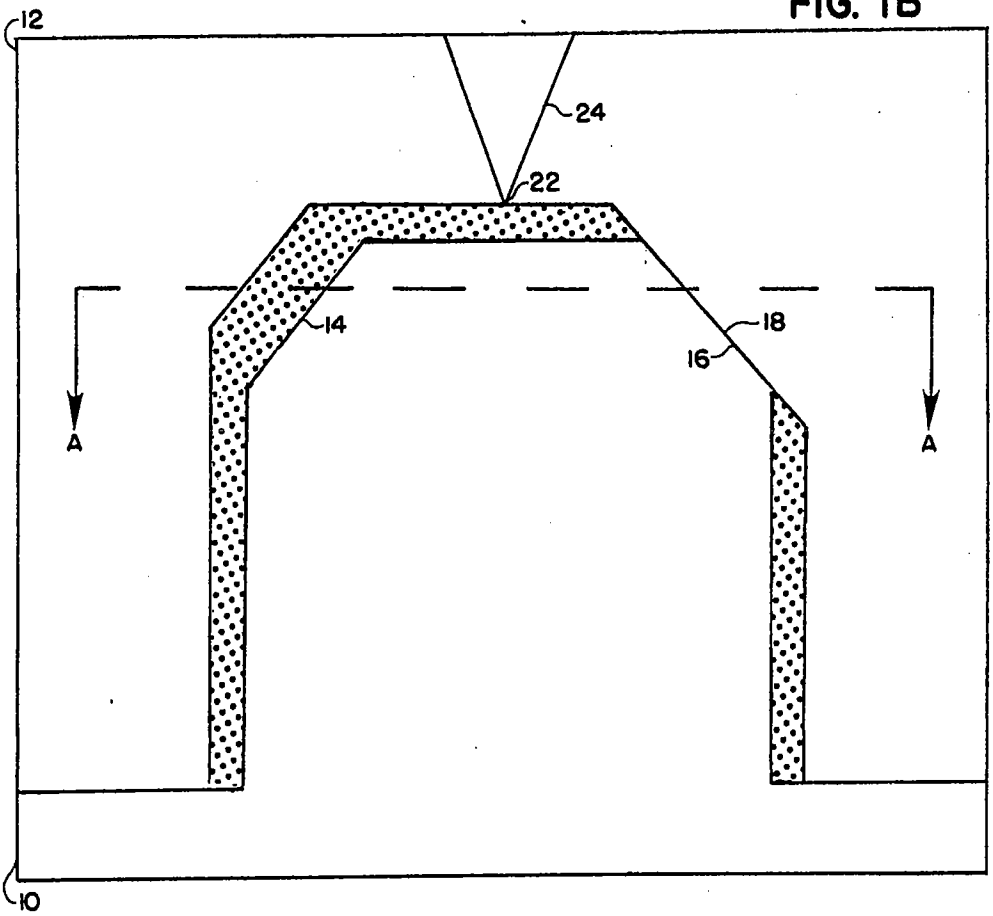


FIG. 1A

FIG. 1B



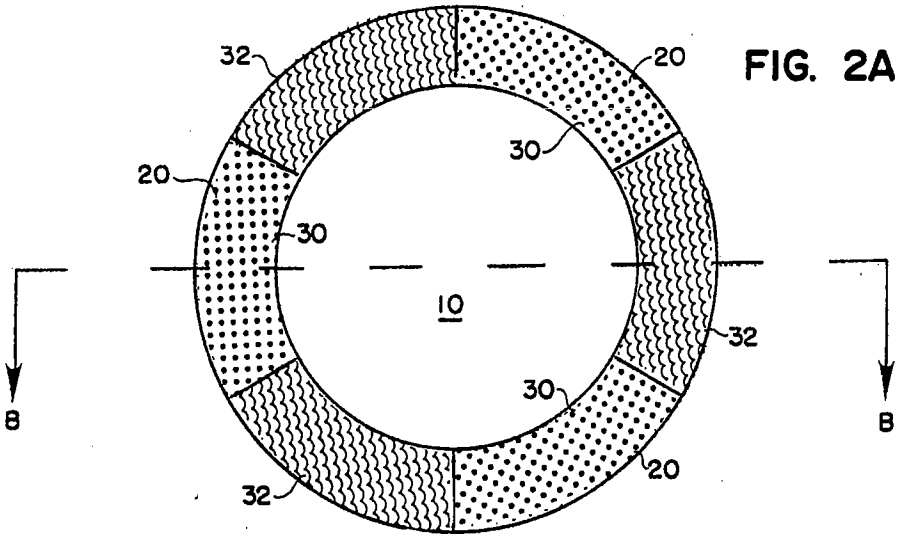


FIG. 2A

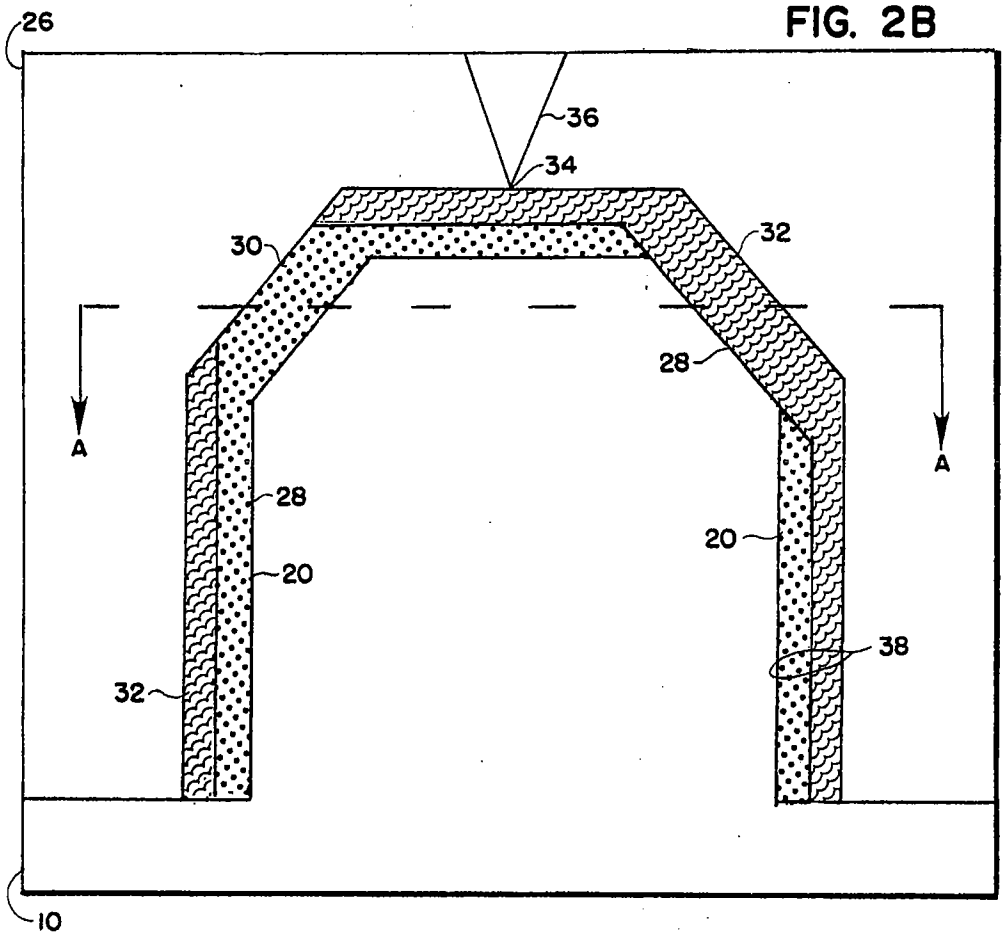


FIG. 2B

FIG. 3B

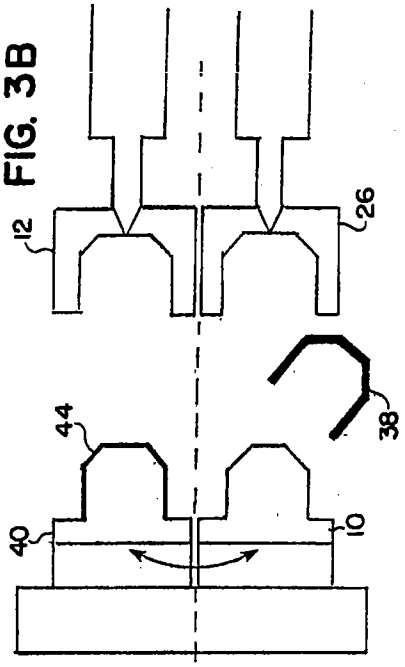


FIG. 3D

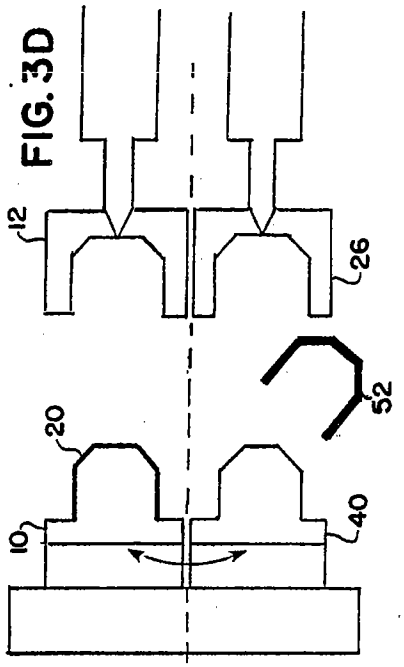


FIG. 3A

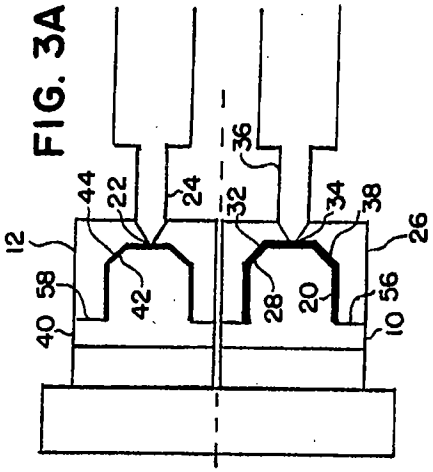


FIG. 3C

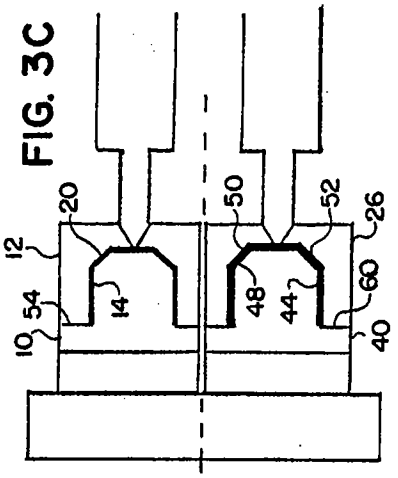


FIG. 4

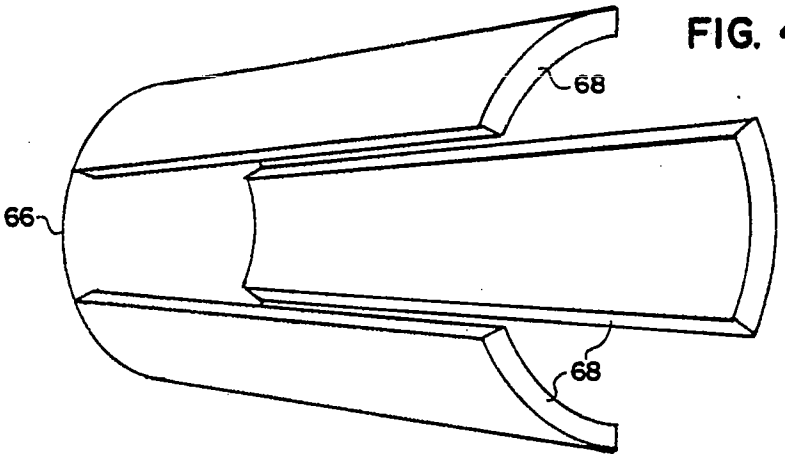


FIG. 5

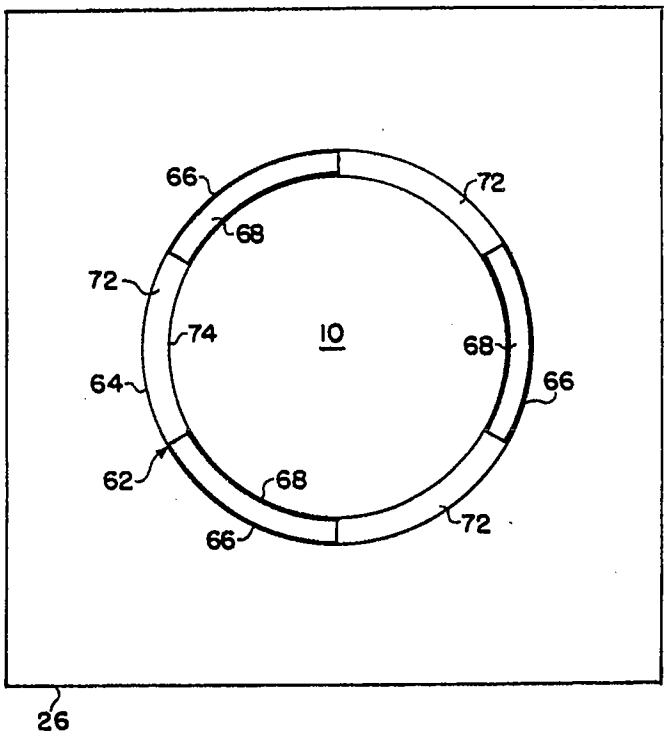


FIG. 6

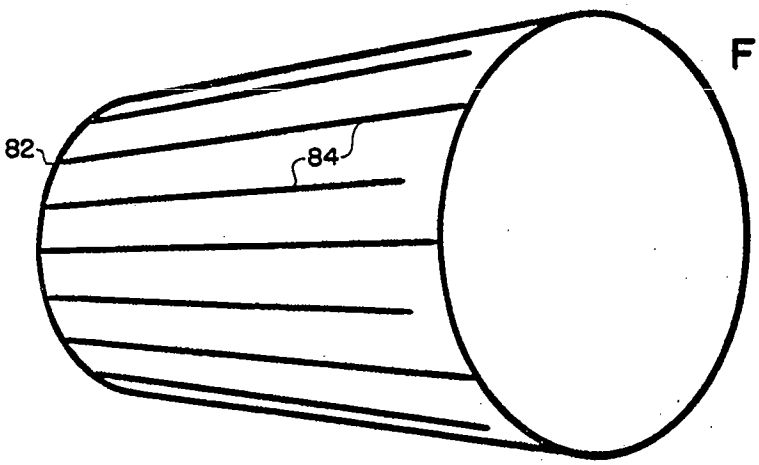
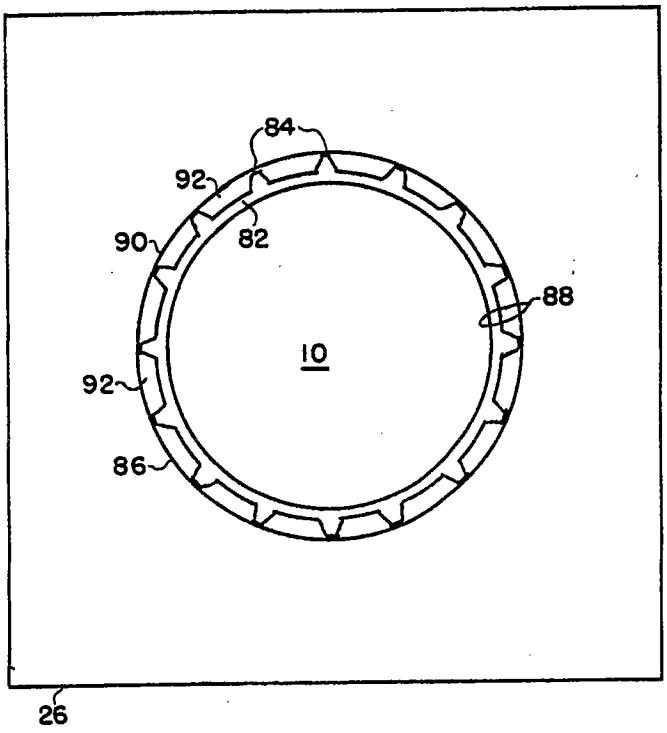


FIG. 7



STABILIZED INJECTION MOLDING WHEN USING A COMMON MOLD PART WITH SEPARATE COMPLIMENTARY MOLD PARTS

This is a continuation of co-pending application Ser. No. 07/152,670 filed on Feb. 5, 1988 now abandoned.

BACKGROUND OF THE INVENTION

The present invention generally pertains to injection molding of plastic products and is particularly directed to stabilizing the dimensions of mold cavities during the injection steps when using a common mold part and at least two complementary mold parts to assemble separate mold cavities for receiving separate injections of plastic materials to produce a thin-walled, hollow plastic product.

The use of a common mold part with at least two complementary mold parts to provide separate mold cavities for receiving separate injections of plastic materials for producing a hollow plastic product is known. In one known prior art method of cyclic injection molding a hollow plastic product, a first mold cavity is defined by a first common mold part and a first complementary mold part; and a second mold cavity is defined by the first common mold part and a second complementary mold part. The method includes the steps of:

(a) combining the first common mold part with the first complementary mold part to assemble the first mold cavity;

(b) injecting a first plastic material into the first mold cavity;

(c) solidifying the injected first plastic material to form a first plastic material component;

(d) combining the first common mold part with the second complementary mold part to assemble the second mold cavity with the first plastic material component attached to the first common mold part so that when the second mold cavity is assembled the first plastic material component is contained within the second mold cavity;

(e) injecting a second plastic material into the second mold cavity while the first plastic material component is contained therein; and

(f) solidifying the injected second plastic material so as to form a second plastic material component that fuses with the first plastic material component to produce a hollow plastic product.

It also is known to expand upon this method by further using a third mold cavity defined by a second common mold part and the first complementary mold part, and a fourth mold cavity defined by the second common mold part and the second complementary mold part. The method further includes the steps of:

(h) during step (d), combining the second common mold part with the first complementary mold part to assemble the third mold cavity;

(i) during step (e), injecting a third plastic material into the third mold cavity;

(j) during step (f), solidifying the injected third plastic material to form a third plastic material component;

(k) during step (a), combining the second common mold part with the second complementary mold part to assemble the fourth mold cavity with the third plastic material attached to the second common mold part so that when the fourth mold cavity is assembled the third plastic material is contained within the fourth mold cavity;

(l) during step (b), injecting the fourth plastic material into the fourth mold cavity while the solidified third plastic material is contained therein; and

(m) during step (c), solidifying the injected fourth plastic material so as to form a fourth plastic material component that fuses with the third plastic material to produce a second said hollow plastic product.

This method has been used for producing hollow plastic products having composite walls of separately injected plastic materials. In performing such method, the first plastic material is injected until it reaches the parting line between the first common mold part and the first complementary mold part; the second plastic material is injected until it reaches the parting line between the first common mold part and the second complementary mold part; the third plastic material is injected until it reaches the parting line between the second common mold part and the first complementary mold part; and the fourth plastic material is injected until it reaches the parting line between the second common mold part and the second complementary mold part.

Typically, all four plastic materials are the same.

SUMMARY OF THE INVENTION

The present invention provides a method and apparatus for injecting molding hollow, thin-walled plastic products, having a closed end and an open end with laminated walls terminating in a rim at the open end, where relative movement between the common mold part and the complementary mold parts is impeded during injection of the plastic materials.

According to the present invention, the first and second plastic materials have different characteristics, and in the injection molding method described above, the step of solidifying the injected first plastic material to form the first plastic material component (step (c)) includes the step of

(g) shaping the first plastic material component such that when the first plastic material component is so contained in the second mold cavity the first plastic material component provides one or more stabilizing regions that rigidly secure the first common mold part in position in relation to the second complementary mold part in order to impede movement of the first common mold part in relation to the second complementary mold part during the injection of the second plastic material into the second mold cavity, to thereby produce a thin-walled plastic product having controlled dimension in that the wall-thickness dimensions of the second mold cavity are stabilized by the stabilizing regions.

The step of injecting the first plastic material into the first mold cavity (step (b)) includes the step of

(h) injecting the first plastic material until it reaches the portion of the first mold cavity that defines the rim of the product; and

the step of injecting the second plastic material into the second mold cavity (step (e)) includes the step of

(i) injecting the second plastic material until it reaches the portion of the second mold cavity that defines the rim of the product.

When the method of the present invention utilizes two common mold cavities, such as described above, the step of solidifying the injected third plastic material to form the third plastic material component (step (j)) includes the step of shaping the third plastic material component such that when the third plastic material

component is so contained in the fourth mold cavity the solidified third plastic material provides one or more stabilizing regions that rigidly secure the second common mold part in position in relation to the second complementary mold part in order to impede movement of the second common mold part in relation to the second complementary mold part during the injection of the fourth plastic material into the fourth mold cavity, to thereby produce a second thin-walled plastic product having controlled dimensions.

The method of the present invention may also be used for molding a product having a side wall including an approximately longitudinal strip that may be transparent to provide a transparent window in the side wall. This feature is particularly advantageous when it is desired to provide a longitudinal window in the side wall in order to monitor the level of a substance, such as a fluid, contained in the plastic product. In one embodiment, the first plastic material component is shaped to provide at least one stabilizing region that is transverse to a parting line between the first common mold part and the first complementary mold part, whereby the longitudinal strip is defined by the transverse stabilizing region. A transparent window is provided in the side wall by injecting a transparent first plastic material into the first mold cavity. A nontransparent second plastic material is injected into the second mold cavity to provide a nontransparent background for printing in the remainder of the side wall. In an alternative embodiment, the first plastic material component is shaped such that when the first plastic material component is contained in the second mold cavity, the second mold cavity defines at least one unfilled cavity region that is transverse to a parting line between the first common mold part and the second complementary mold part, whereby the longitudinal strip is defined by the unfilled transverse cavity region. In this embodiment, a transparent window is provided in the side wall by injecting a transparent second plastic material into the second mold cavity; and a nontransparent first plastic material is injected into the first mold cavity to provide a nontransparent background for printing in the remainder of the side wall.

In another aspect of the method of the present invention, the step of shaping the first plastic material component (step (g)) may further include the step of providing a first complementary mold part that is dimensioned in relation to the first common mold part such that when combined with the first common mold part to assemble the first mold cavity, portions of the first complementary mold part contact portions of the first common mold part to rigidly secure the first common mold part in position in relation to the first complementary mold part in order to impede movement of the first common mold part in relation to the first complementary mold part during the injection of the first plastic material into the first mold cavity.

The present invention further provides apparatus for performing the method of the present invention and hollow, thin-walled plastic products molded according to the method of the present invention.

Additional features of the present invention are described in relation to the description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWING

FIGS. 1A and 1B are sectional views illustrating a first mold cavity assembled by combining a first common mold part with a first complementary mold part. FIG. 1A is a top sectional view taken along lines A—A in FIG. 1B; and FIG. 1B is a side sectional view taken along lines B—B in FIG. 1A. FIGS. 1A and 1B further show the first plastic material injected into the first mold cavity.

FIGS. 2A and 2B are sectional views illustrating a second mold cavity assembled by combining the first common mold part of FIGS. 1A and 1B with a second complementary mold part. FIG. 2A is a top sectional view taken along lines A—A in FIG. 2B; and FIG. 2B is a side sectional view taken along lines B—B in FIG. 2A. FIGS. 2A and 2B further show the first plastic material component contained in the second mold cavity and the second plastic material injected into the second mold cavity.

FIGS. 3A through 3D illustrate a series of steps in the performance of a preferred embodiment of the method of the present invention.

FIG. 4 illustrates a first plastic material component formed in an alternative embodiment of the method of the present invention.

FIG. 5 is a sectional view illustrating a second mold cavity containing the first plastic material component of FIG. 4. FIG. 5 also is a sectional view illustrating a product molded according to such alternative embodiment of the method of the present invention.

FIG. 6 illustrates a first plastic material component formed in a further alternative embodiment of the method of the present invention.

FIG. 7 is a sectional view illustrating a second mold cavity containing the first plastic material component of FIG. 6. FIG. 7 also provides a sectional view of a product molded according to such further alternative embodiment of the method of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1A and 1B the apparatus of a preferred embodiment of the present invention includes a first common mold part **10** and first complementary mold part **12**. The first common mold part **10** is combined with the first complementary mold part **12** to assemble a first mold cavity **14**. The first complementary mold part **12** is dimensioned in relation to the first common mold part **10** such that when so combined with the first common mold part **10** to assemble the first mold cavity **14**, portions **16** of the first complementary mold part **12** contact portions **18** of the first common mold part **10** to rigidly secure the first common mold part **10** in position in relation to the first complementary mold part **12** in order to impede movement of the first common mold part **10** in relation to the first complementary mold part **12** during injection of the first plastic material **20** into the first mold cavity **14**. The first plastic material **20** is injected into the mold cavity **14** through a gate **22** and a runner **24** in the first complementary mold part **12**.

The injected first plastic material **20** is solidified to form a first plastic material component **20** by cooling the injected first plastic material in the first mold cavity **14**, whereby the first plastic material component **20** is shaped in accordance with the dimensions of the first mold cavity **14**. In an alternative embodiment, the first plastic material component may be further shaped following removal of the first complementary mold part **12**.

Referring to FIGS. 2A and 2B the apparatus of a preferred embodiment of the present invention includes a second complementary mold part **26**. The first common mold part **10** is combined with the second complementary mold part **26** to assemble a second mold cavity **28** with the first plastic material component **20** attached to the first common mold part **10**, so that when the second mold cavity **28** is assembled, the first plastic material component **20** is contained within the second mold cavity **28**.

The first plastic material component **20** is shaped such that when the first plastic material component **20** is so contained in the second mold cavity **28** the first plastic material component **20** provides one or more stabilizing regions **30** that rigidly secure the first common mold part **10** in position in relation to the second complementary mold part **26** in order to impede movement of the first common mold part **10** in relation to the second complementary mold part **26** during the insertion of a second plastic material **32** into the second mold cavity **28**.

The second plastic material **32** is injected into the second mold cavity **28** through a gate **34** and a runner **36** in the second complementary mold part **26** while the first plastic material component **20** is contained in the second mold cavity **28**.

The injected second plastic material **32** is solidified by cooling in the second mold cavity **28** so as to form a second plastic material component **32** that fuses with the first plastic material component **20** to produce thin-walled hollow plastic product **38** having controlled dimensions.

A preferred embodiment of a method of cyclic injection molding of hollow, thin-walled plastic products according to the present invention, utilizing two common mold parts and two complementary mold parts to provide four mold cavities is described with reference to FIGS. 3A through 3D.

Referring to FIG. 3A, a second common mold part **40** is combined with the first complementary mold part **12** to assemble a third mold cavity **42**; while at the same time the first common mold part **10** is combined with the second complementary mold part **26** to assemble a second mold cavity **28**, with the first plastic material component **18** attached to the first common mold part **10**, so that when the second mold cavity **28** is assembled, the first plastic material component **20** is contained within the second mold cavity **28**. The formation of the first plastic material component **20** is discussed above in relation to FIGS. 1A and 1B.

A third plastic material **44**, which may be the same as the first plastic material **20**, is injected into the third mold cavity **42** through the gate **22** and the runner system **24** contained in the first complementary mold part **12**; while at the same time, the second plastic material **32** is injected into the second mold cavity **28** through the gate **34** and a runner system **36** contained in the second complementary mold part **26**.

The injected third plastic material **44** is solidified by cooling in the third mold cavity **42** to form a third plastic material component **44**; while at the same time the injected second plastic material **32** is solidified by cooling in the second mold cavity **28** so as to form the second plastic material component **28** that fuses with the first plastic material component **20** to produce the hollow, thin-walled plastic product **38**.

Referring to FIG. 3B, the first common mold part **10** and the second common mold part **40** are separated from the second complementary mold part **26** and the first complementary mold part **12** respectively; and the molded hollow, thin-walled plastic product **38** is ejected from first common mold part **10**, while the third plastic material component **44** is retained on the third common mold part **40**. The positions of the first common mold part **10** and the second common mold part **40** are then interchanged from those shown in FIG. **3B** to those shown in FIG. **3C**.

Referring to FIG. **3C**, the first common mold part **10** is combined with the first complementary mold part **12** to assemble the first mold cavity **14**; while at the same time the second common mold part **40** is combined with the second complementary mold part **26** to assemble a fourth mold cavity **48**, with the first plastic material component **44** attached to the third common mold part **40**, so that when the fourth mold cavity **48** is assembled, the third plastic material component **44** is contained within the fourth mold cavity **48**. The formation of the third plastic material component **44** is discussed above in relation to FIG. **3A**.

The first plastic material **20**, which may be the same as the third plastic material **44**, is injected into the first mold cavity **14** through the gate **22** and the runner system **24** contained in the first complementary mold part **12**; while at the same time, a fourth plastic material **50**, which may be identical to the second plastic material **32**, is injected into the fourth mold cavity **48** through the gate **34** and a runner system **36** contained in the second complementary mold part **26**.

The injected first plastic material **20** is solidified by cooling in the first mold cavity **14** to form another first plastic material component **20**; while at the same time the injected fourth plastic material **50** is solidified by cooling in the fourth mold cavity **48** so as to form the second plastic material component **48** that fuses with the third plastic material component **44** to produce a second hollow, thin-walled plastic product **52**.

Referring to FIG. **3D**, the first common mold part **10** and the second common mold part **40** are separated from the first complementary mold part **12** and the second complementary mold part **26** respectively; and the second molded hollow, thin-walled plastic product **52** is ejected from second common mold part **40**, while the first plastic material component **20** is retained on the first common mold part **10**. The positions of the first common mold part **10** and the second common mold part **40** are then interchanged from those shown in FIG. **3D** to those shown in FIG. **3A**, and the cycle is repeated.

As described above, the first plastic material component **20** is shaped such that when the first plastic material component **20** is contained in the second mold cavity **28**, the first plastic material component **20** provides one or more stabilizing regions **30** that rigidly secure the first common mold part **20** in position in relation to the second complementary mold part **26** in order to impede movement of the first common mold part **10** in relation to the second complementary mold part **26** during injection of the second plastic material **32** into the second mold cavity **28**.

Likewise, the third plastic material component **44** is shaped such that when the third plastic material component **44** is contained in the fourth mold cavity **48**, the third plastic material component **44** provides one or more stabilizing regions that rigidly secure the second common mold part **40** in position in relation to the second complementary mold part **26** in order to impede

movement of the second common mold part **40** in relation to the second complementary mold part **26** during injection of the fourth plastic material **50** into the fourth mold cavity **48**.

The method described above with reference to FIGS. **3A** through **3D** may be used for producing hollow, thin-walled plastic products having laminated walls of different plastic materials. In performing such method, the first plastic material **20** is injected until it reaches a parting line **54** between the first common mold part **10** and the first complementary mold part **12** (FIG. **3C**); and the second plastic material **32** is injected until it reaches a parting line **56** between the first common mold part **10** and the second complementary mold part **26** (FIG. **3A**). Likewise, the third plastic material **44** is injected until it reaches a parting line **58** between the second common mold part **40** and the first complementary mold part (FIG. **3A**); and the fourth plastic material **50** is injected until it reaches a parting line **60** between the second common mold part **40** and the second complementary mold part **26**.

Referring to FIGS. **4** and **5**, the method of the present invention also may be used for molding a product **62** having a side wall **64** including at least one approximately longitudinal strip that may be transparent to thereby provide a transparent window in the side wall **64**.

In one embodiment, the first plastic material component **66** is shaped to provide at least one stabilizing region **68** that is transverse to a parting line **54** (FIG. **3C**) between the first common mold part **10** and the first complementary mold part **12**, whereby each longitudinal strip is defined by a transverse stabilizing region **68**. The stabilizing regions **68** need not extend all the way to the parting line **54**. A transparent window is provided in the side wall **64** by injecting a transparent first plastic material into the first mold cavity to provide the first plastic material component **66**. A nontransparent second plastic material **72** is injected into the second mold cavity **74** to provide a nontransparent background for printing in the remainder of the side wall **64**.

In an alternative embodiment, the first plastic material component **66** is shaped such that when the first plastic material component **66** is contained in the second mold cavity **74**, the second mold cavity **74** defines at least one unfilled cavity region **72** that is transverse to a parting line **56** (FIG. **3A**) between the first common mold part **10** and the second complementary mold part **26**, whereby longitudinal strips may be provided in the unfilled transverse cavity regions **72**. The unfilled transverse cavity regions **72** need not extend all the way to the parting line **56**. In this embodiment, transparent windows are defined in the side wall **64** by injecting a transparent second plastic material into the second mold cavity **74** to fill the transverse cavity regions **72**. Prior thereto, a nontransparent first plastic material is injected into the first mold cavity to form the first plastic material component **66** and thereby provide a nontransparent background for printing in the remainder of the side wall **64**.

Referring to FIGS. **6** and **7**, in a further preferred embodiment, the first plastic material component **82** that is shaped as shown in FIG. **6** to include a plurality of symmetrically disposed stabilizing regions **84**, which extend approximately longitudinally over a portion of the side wall **86** of the molded product **88**. The first plastic material component **82** is molded in a first mold cavity in accordance with the teaching of applicant's U.S. Pat. application No. 7,463, filed Jan. 26, 1987 and in accordance of the above description to the extent that such description is compatible with the teaching of application Ser. No. 7,463. After the first plastic material component **82** is formed in a first mold cavity, which is assembled by combining a first complementary mold part **12** and a first common mold part **10**, the first plastic component **82** is retained on the first common mold part **10** while the first common mold part **10** is combined with a second complementary mold part **26** to assemble a second mold cavity **90**, as shown in FIG. **7**.

Referring to FIG. **7**, the first plastic material component **82** is shaped such that when the first plastic material component **82** is contained in the second mold cavity **90**, the first plastic material component **82** provides one or more stabilizing regions **84** that rigidly secure the first common mold part **10** in position in relation to the second complementary mold part **26** in order to impede movement of the first common mold part **10** in relation to the second complementary mold part **26** during injection of the second plastic material **92** into the second mold cavity **90**.

The injected second plastic material **92** is solidified by cooling in the second mold cavity **90** to form a second plastic material component **92** that fuses with the first plastic material component **82** to produce the hollow, thin-walled, plastic product **88**. The side wall **86** of the molded product **88** thus includes two layers of plastic **82, 92**. The molded product **88** has controlled dimensions, is generally shaped as shown in FIG. **6**, and has a lateral cross section as shown in FIG. **7**. The side wall **86** of the molded product thus includes two layers of plastic **82, 92**.

The stabilizing regions **84** have a wall thickness equal to the thickness of the side wall **86** and are transverse to the parting line **56** (FIG. **3A**) between the first common mold part **10** and the second complementary mold part **26** to thereby provide longitudinal transparent windows **84** in the side wall **86**. The stabilizing regions **84** need not extend all the way to the parting line **56**. In a preferred embodiment of this product, the other side-wall layer **90** is nontransparent and extends throughout the majority of the side wall **86**.

The present invention may be modified from the embodiments illustrated and described above. The common mold parts may be cavity mold parts instead of core mold parts, as illustrated and described herein. In addition, injections of plastic material into any given mold cavity may be made through more than one gate. Also, injections of plastic materials may be made into more than two mold cavities simultaneously, whereby the number of mold cavities included in the mold may be a multiple of the number of separate mold cavities required to produce a single product. For example, when using the method described and illustrated herein for producing a product composed of two plastic material components formed following injection of plastic material into two separate mold cavities, the number of mold cavities included in the mold may be any multiple of two, i.e. 2, 4, 6, etc.

The present invention also can be used to mold products including more than two plastic material components formed following injection of plastic material into more than two separate mold cavities. In an embodiment requiring three separate mold cavities, a third complementary mold part is used, and the fused first and second plastic material components are retained on

the first common mold part when the first common mold part is combined with the third complementary mold part to assemble the third mold cavity, with the fused first and second mold parts being shaped to stabilize the common mold in relation to the third complementary mold part during injection of a third plastic material into the third mold cavity.

The core-stabilization techniques described in applicant's U.S. Pat. Nos. 4,381,275 and 4,508,676; U.S. Pat. No. 3,737,272 to Stegmuller; and in Australian Patent Specification 17,577/70 filed by Ryles and published Jan. 20, 1972 may be used to stabilize the common mold part in relation to the first complementary mold part during the injection of the first plastic material in lieu of the technique described above with relation to FIGS. 1A and 1B.

The first and second plastic materials may be either the same material or different materials. It is sometimes advantageous to use first and second plastic materials having different physical characteristics. For example, the present invention is ideally suited for molding a hollow, thin-walled plastic product in which the side wall must provide both a moisture barrier and a gas (such as Oxygen) barrier. To mold such a product, a plastic material having a desirable moisture-barrier characteristic is selected as one of the injected plastic materials; and a plastic material having a desirable gas-barrier characteristic is selected as the other injected plastic material.

I claim:

1. A method of cyclic injection molding a thin-walled hollow, plastic product having a closed end and an open end with laminated walls terminating in a rim at the open end, utilizing a first mold cavity and a second mold cavity, the first mold cavity being defined by a first common mold part and a first complementary mold part, and the second mold cavity being defined by the first common mold part and a second complementary mold part, the method comprising the steps of

(a) combining the first common mold part with the first complementary mold part to assemble the first mold cavity;

(b) injecting a first plastic material into the first mold cavity;

(c) solidifying the injected first plastic material to form a first plastic material component;

(d) combining the first common mold part with the second complementary mold part to assemble the second mold cavity with the first plastic material component attached to the first common mold part so that when the second mold cavity is assembled the first plastic material component is contained within the second mold cavity;

(e) injecting a second plastic material having different characteristics than the first plastic material into the second mold cavity while the first plastic material component is contained therein; and

(f) solidifying the injected second plastic material so as to form a second plastic material component that fuses with the first plastic material component to produce a hollow plastic product;

wherein step (c) comprises the step of

(g) shaping the first plastic material component such that when the first plastic material component is so contained in the second mold cavity the first plastic material component provides one or more stabilizing regions that rigidly secure the first common mold part in position in relation to the second complementary mold part in order to impede movement of the first common mold part in relation to the second complementary mold part during step (e), to thereby produce a thin-walled plastic product having controlled dimensions;

wherein step (b) comprises the step of

(h) injecting the first plastic material until it reaches the portion of the first mold cavity that defines the rim of the product; and

wherein step (e) comprises the step of

(i) injecting the second plastic material until it reaches the portion of the second mold cavity that defines the rim of the product.

2. A method according to claim 1 for molding a product having a side wall including an approximately longitudinal strip, wherein step (g) comprises shaping the first plastic material component to provide at least one said stabilizing region that is transverse to a parting line between the first common mold part and the first complementary mold part, whereby said longitudinal strip is defined by said transverse stabilizing region.

3. A method according to claim 2,

wherein step (b) comprises injecting a said first plastic material that is transparent, whereby said strip defines a transparent window in the side wall; and

wherein step (e) comprises injecting a said second plastic material that is nontransparent.

4. A method according to claim 1 for molding a product having a side wall including an approximately longitudinal strip, wherein step (g) comprises shaping the first plastic material component such that when the first plastic material component is contained in the second mold cavity, the second mold cavity defines at least one unfilled cavity region that is transverse to a parting line between the first common mold part and the second complementary mold part, whereby said longitudinal strip is defined by said unfilled transverse cavity region.

5. A method according to claim 4,

wherein step (b) comprises injecting a said first plastic material that is nontransparent; and

wherein step (e) comprises injecting a said second plastic material that is transparent, whereby said strip defines a transparent window in the side wall.

6. A method according to claim 1, for cyclic injection molding a plurality of thin-walled, hollow, plastic products, further utilizing a third mold cavity and a fourth mold cavity, the third mold cavity being defined by a second common mold part and the first complementary mold part, and the fourth mold cavity being defined by the second common mold part and the second complementary mold part, the method further comprising the steps of:

(h) during step (d), combining the second common mold part with the first complementary mold part to assemble the third mold cavity;

(i) during step (e), injecting a third plastic material into the third mold cavity;

(j) during step (f), solidifying the injected third plastic material to form a third plastic material component;

(k) during step (a), combining the second common mold part with the second complementary mold part to assemble the fourth mold cavity with the third plastic material attached to the second common mold part so that when the fourth mold cavity is assembled the third plastic material is contained within the fourth mold cavity;

(l) during step (b), injecting the fourth plastic material into the fourth mold cavity while the solidified third plastic material is contained therein; and

(m) during step (c), solidifying the injected fourth plastic material so as to form a fourth plastic material component that fuses with the third plastic material to produce a second hollow plastic product;

wherein step (j) comprises the step of

(n) shaping the third plastic material component such that when the third plastic material component is so contained in the fourth mold cavity the third plastic material component provides one or more stabilizing regions that rigidly secure the second common mold part in position in relation to the second complementary mold part in order to impede movement of the second common mold part in relation to the second complementary mold part during step (l), to thereby produce a second thin-walled plastic product having controlled dimensions.

7. A method according to claim 6, for producing said products having laminated walls,

wherein step (b) comprises the step of

(o) injecting the first plastic material until it reaches the parting line between the first common mold part and the first complementary mold part;

wherein step (e) comprises the step of

(p) injecting the second plastic material until it reaches the parting line between the first common mold part and the second complementary mold part;

wherein step (i) comprises the step of

(q) injecting the third plastic material until it reaches the parting line between the second common mold part and the first complementary mold part; and

wherein step (l) comprises the step of

(r) injecting the fourth plastic material until it reaches the parting line between the second common mold part and the second complementary mold part.

8. A method according to claim 6, wherein the first plastic material is the same as the third plastic material and the second plastic material is the same as the fourth plastic material.

9. A method according to claim 1, wherein step (g) further comprises providing a said first complementary mold part that is dimensioned in relation to the first common mold part such that when so combined with the first common mold part to assemble the first mold cavity, portions of the first complementary mold part contact portions of the first common mold part to rigidly secure the first common mold part in position in relation to the first complementary mold part in order to impede movement of the first common mold part in relation to the first complementary mold part during step (b).

10. A method according to claim 1, further comprising the step of

(j) between steps (c) and (d), separating said first common mold part with the first plastic material component attached thereto from said first complementary mold part without dividing that portion of said first complementary mold part that defines the rim of the product.

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