In the Matter of

CERTAIN MOLDED-IN SANDWICH PANEL INSERTS AND METHODS FOR THEIR INSTALLATION

Investigation No. 337-TA-99
(Modification Proceeding)

USITC PUBLICATION 1297

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United States International Trade Commission / Washington, D.C. 20436

UNITED STATES INTERNATIONAL TRADE COMMISSION

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of CERTAIN MOLDED-IN SANDWICH PANEL INSERTS AND METHODS FOR THEIR INSTALLATION	Investigation No. 337-TA-99

COMMISSION ACTION AND ORDER

Introduction

The Commission, pursuant to section 211.57(a) of its Rules of Practice and Procedure, voted on July 27, 1982, to consider modification of the findings on remedy, public interest, and bonding made at the conclusion of investigation No. 337-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation. This action followed Presidential disapproval on June 28, 1982, of the Commission action and order in this investigation. 47 F.R. 29919 (1981). Upon review of the record developed in this investigation, including all comments received on the question of modification, the Commission determined on September 8, 1982, that the Commission finding on remedy should be modified 1/ to provide for--

(1) A general exclusion order prohibiting the importation of infringing inserts for the remaining life of U.S. Letters Patent 3,282,015; and

1/ Commissioner Stern found that the Commission did not have the authority to modify its determination after disapproval by the President. She, therefore, reiterated her original finding that the most appropriate remedy is a general exclusion order and a cease and desist order directed to The Young Engineers, Inc.

(2) A cease and desist order directed to The Young Engineers, Inc., prohibiting it from selling imported inserts acquired subsequent to institution of the investigation where such sales would contribute to or induce infringement of U.S. Letters Patent Nos. 3,271,498 and/or 3,392,225.

Action

Having reviewed the record developed in this investigation, including all comments received concerning the question of modification, the Commission on September 8, 1982, determined that--

1. It is appropriate, pursuant to section 211.57 of the Commission's Rules of Practice and Procedure, to modify its finding on remedy in investigation No. 337-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation;

2. The Commission action in investigation No. 337-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation, should be modified to provide for a general exclusion order issued pursuant to section 337(d) (19 U.S.C. § 1337(d)) and a cease and desist order issued pursuant to section 337(f) (19 U.S.C. § 1337(f));

3. The public-interest factors enumerated in section 337(d) and (f) do not preclude the issuance of the orders referred to in paragraph 2 above; and

4. The bond provided for in section 337(g)(3) (19 U.S.C. § 1337(g)(3)) should be in the amount of 173 percent of the entered value of the molded-in sandwich panel inserts in question.

Order

Accordingly, it is hereby ORDERED THAT--

1. Molded-in sandwich panel inserts that infringe U.S. Letters Patent 3,282,015 are excluded from entry into the United States for the term of said patent, except where such importation is licensed by the owner of said patent;

2. The Young Engineers, Inc., cease and desist from contributing to or inducing the infringement of U.S. Letters Patents Nos. 3,271,498 and/or 3,392,225, as provided in the cease and desist order attached hereto;

3. The public-interest factors enumerated in section 337(d) and (f) do not preclude issuance of the orders referred to in paragraphs 1 and 2 above;

4. The articles ordered to be excluded from entry into the United States pursuant to paragraph 1 above are entitled to entry under bond in the amount of 173 percent of the entered value of said articles during the Presidential review period provided for in section 337(g)(2) (19 U.S.C. § 1337(g)(2));

5. Notice of this Action and Order be published in the Federal Register;

6. Copies of this Action and Order and the opinions issued in connection therewith be served upon each party of record to this investigation and upon the Department of Health and Human Services, the Department of Justice, the Federal Trade Commission, and the Secretary of the Treasury;

7. Copies of the cease and desist order be served upon the complainant, respondent The Young Engineers, Inc., and the Commission investigative attorney; and

8. The Commission may amend this Order in accordance with the procedure described in section 211.57 of the Commission's Rules of Practice and Procedure (46 F.R. 17533, Mar. 18, 1981; to be codified at 19 C.F.R. § 211.57).

By order of the Commission.

Kenneth R. Mason
Secretary

Issued: September 17, 1982

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN MOLDED-IN SANDWICH PANEL INSERTS AND METHODS FOR THEIR INSTALLATION	Investigation No. 337-TA-99

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT The Young Engineers, Inc., 23151 Alcalde Drive, Suite B-5, Laguna Hills, California 92653, cease and desist from violating section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) by inducing or contributing to infringement of U.S. Letters Patents Nos. 3,271,498 and/or 3,392,225.

I

(Definitions)

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "TYE" shall mean The Young Engineers, Inc., 23151 Alcalde Drive, Suite B-5, Laguna Hills, California 92653.

(C) "United States" shall mean the 50 States, the District of Columbia, and Puerto Rico.

II

(Applicability)

The provisions of this Order shall apply to TYE and to its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and/or majority-owned business entities, successors, and assignees, all those persons acting in concert with them, and to each of them, and to all other persons who receive actual notice of this Order by service in accordance with section VI hereof.

III

(Conduct Prohibited)

TYE shall not induce or contribute to the practice within the United States of any method for the installation of imported molded-in sandwich panel inserts into sandwich panels, where such method infringes U.S. Letters Patents Nos. 3,271,498 and/or 3,392,225, except as such installation may be licensed by the owner or owners of said patents. The prohibited conduct includes, but is not limited to, the use, in connection with the sale of imported inserts, of brochures, pamphlets, leaflets, advertisements, or other sales literature which advocates, explains, describes, or illustrates any method of installation covered by the claims of U.S. Letters Patents Nos. 3,271,498 and/or 3,392,225; oral or written instructions to direct or indirect vendees, whether in connection with the sale of inserts or in the course of a customer service call, which advise said vendees in the practice of any method covered by U.S. Letters Patents Nos. 3,271,498 and/or 3,392,225, where it is apparent that such method is or will be used in the installation of inserts imported and sold by TYE.

This Order is effective with respect to imported molded-in sandwich panel inserts acquired by TYE subsequent to April 29, 1981, and until September 6, 1983, with respect to U.S. Letters Patent 3,271,498, and until July 9, 1985, with respect to U.S. Letters Patent 3,392,225.

IV

(Reporting)

Within 10 days after the last day of each reporting period specified below, TYE shall report to the Commision--

(A) Its importations, if any, during the reporting period in question, of molded-in sandwich panel inserts;

(B) Its sales in the United States, during the reporting period in question, of imported molded-in sandwich panel inserts acquired subsequent to April 29, 1981; and

(C) All contracts, whether written or oral, entered into during the reporting period in question, to sell imported molded-in sandwich panel inserts acquired subsequent to April 29, 1981.

In connection with the importations and sales of molded-in sandwich panel inserts referred to in paragraphs A and B above, TYE shall provide the Commission with two copies of all invoices, delivery orders, bills of lading, and other documents concerning the importation or sale in question. Such copies shall be attached to the reports required by paragraphs A and B above.

In connection with the sales of imported molded-in sandwich panel inserts referred to in paragraph B above, TYE shall provide to the Commission two copies of each brochure, pamphlet, leaflet, instruction sheet, or other item of sales or technical literature distributed to one or more direct or indirect

vendees where such brochure, pamphlet, leaflet, instruction sheet, or other item of sales or technical literature advocates, describes, explains, illustrates, or refers to any method for the installation of inserts into sandwich panels. For each brochure, pamphlet, leaflet, instruction sheet, or other item of sales or technical literature, TYE shall indicate to which vendee(s) or prospective vendee(s) such document was distributed. The required copies shall be attached to the reports required by paragraph B above.

In connection with the sales of imported molded-in sandwich panel inserts referred to in paragraph B above, TYE shall provide the Commission with two copies of each advertisement or announcement published subsequent to the date of issuance of this Order. For each advertisement or announcement furnished, TYE shall indicate when and where (i.e., in which publication) such advertisement or announcement was published. The required copies shall be attached to the reports required by paragraph B above.

The first report required under this section shall cover the period commencing on April 29, 1981, and ending on September 30, 1982. The second report shall cover the period October 1, 1982, through September 30, 1983. The third report shall cover the period October 1, 1983, through September 30, 1984. The fourth and last report shall cover the period October 1, 1984, through June 30, 1985.

Failure to report as required by this section shall constitute a violation of this Order.

V

(Compliance and Inspection)

TYE shall furnish or otherwise make available to the Commission or its authorized representatives, upon written request by the Commission mailed to

TYE's principal office in the United States, all books, ledgers, accounts, correspondence, memorandums, financial reports, and other records or documents in its possession or control for the purpose of verifying any matter or statement contained in the reports required under section IV of this Order.

VI

(Service of Order)

TYE is ordered and directed to--

(A) Serve, within 30 days after the date of issuance of this Order, a copy of the Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the marketing, distribution, or sale of imported sandwich panel inserts in the United States.

(B) Serve, within 30 days after the succession of any of the persons referred to in paragraph A above, a copy of this Order upon each successor.

(C) Maintain such records as will show the name, title, and address of each such officer, director, managing agent, agent, and employee upon whom the Order has been served, together with the date on which service was made.

(D) The obligations set forth in paragraphs B and C above shall remain in effect until July 9, 1985.

VII

(Confidentiality)

Information obtained by the means provided in sections IV and V of this Order will be made available only to the Commission and its authorized

representatives, will be entitled to confidential treatment, and will not be divulged by any authorized representative of the Commission to any person other than another duly authorized representative of the Commission, except as may be required in the course of securing compliance with this Order, or as otherwise required by law. Disclosure hereunder will not be made by the Commission without 10 days' prior notice to TYE by service of such notice on TYE's principal office in the United States.

VIII

(Enforcement)

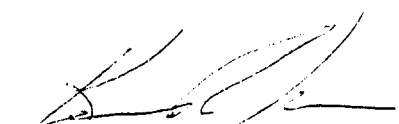
Violation of this Order may result in an action for civil penalties in accordance with the provisions of section 337(f) of the Tariff Act of 1930 (19 U.S.C. § 1337(f)) and such other action as the Commission may deem appropriate. In determining whether TYE is in violation of this Order, the Commission may infer facts adverse to TYE if TYE fails to provide adequate or timely information as required by this Order.

IX

(Modification)

This Order may be modified by the Commission on its own motion or upon motion by any person pursuant to section 211.57 of the Commission's Rules of Practice and Procedure. (46 F.R. 17533, Mar. 18, 1981; to be codified at 19 C.F.R. § 211.57.)

By order of the Commission.



Kenneth R. Mason
Secretary

Issued: September 17, 1982

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of CERTAIN MOLDED-IN SANDWICH PANEL INSERTS AND METHODS FOR THEIR INSTALLATION	Investigation No. 337-TA-99

COMMISSION OPINION

Introduction and Summary

Following Presidential disapproval of the Commission action and order in Investigation No. 33-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation, the Commission, on July 27, 1982, voted to consider modification of the Commission finding on remedy, pursuant to section 211.57 of the Commisson Rules of Practice and Procedure. The Commission on September 8, 1982, voted to modify 1/ its findings on remedy, the public interest, and bonding for the following reasons.

A determination on violation and the action taken thereunder, disapproved by the President, is a "final Commission action" within the meaning of Rule 211.57. This interpretation of "final Commission action" in Rule 211.57 is consistent with the provisions of section 337(g)(2) of the Tariff Act of 1930, which addresses the effect that Presidential disapproval has on a Commission determination and action. Section 337(g)(2) states that the President's disapproval of a determination of the Commission results in such determination and action having "no force or effect." "No force or effect" in section 337(g)(2), viewed in the context of the statute as a whole, means that the

1/ Commissioner Stern dissented on the vote on whether to modify.

Commission determination and action, upon disapproval by the President, remain valid but will not be enforced. This is the only interpretation which comports with the allocation of responsibility for the administration of section 337 found in the statute and the legislative history. The Commission's interpretation of the statute is consistent with the intent of Congress that the President's authority to intervene and disapprove a Commission determination would be for policy reasons only, not for the purpose of reversing a Commission finding of a violation of section 337. This was recognized by the President in his disapproval of the Commission's determination wherein he stated that his decision was "based on narrow grounds and does not mean that the petitioner in the case is left without legal remedies."

Inasmuch as the Commission determination remains valid, it can be modified when the Commission finds such action to be appropriate. In the instant investigation, the Commission believes that the circumstances warrant modification of the determination.

Upon review of the record developed in this investigation, including all comments received on the question of modification, the Commission determined on September 8, 1982, that the Commission finding on remedy should be modified to provide for--

> (1) A general exclusion order prohibiting the importation of infringing inserts for the remaining life of U.S. Letters Patent 3,282,015; and
>
> (2) A cease and desist order directed to The Young Engineers, Inc., prohibiting it from selling imported inserts acquired subsequent to institution of the investigation where such sales would contribute to or induce infringement of U.S. Letters Patent Nos. 3,271,498 and/or 3,392,225.

Procedural History

On March 18, 1982, the Commission 2/ unanimously determined that there is a violation of section 337 in the importation and sale of certain molded-in sandwich panel inserts, which infringe and contribute to or induce the infringement of certain claims of U.S. Letters Patents Nos. 3,282,015 (the '015 patent), 3,271,498 (the '498 patent), and 3,392,225 (the '225 patent), the effect or tendency of which is to substantially injure an industry, efficiently and economically operated, 3/ in the United States. Accordingly, the Commission issued (1) a general exclusion order prohibiting the importation of infringing inserts for the remaining life of the'015 (product) patent; (2) a cease and desist order prohibiting The Young Engineers, Inc. (TYE, the importer) from selling imported inserts acquired subsequent to institution of the investigation where such sales would contribute to or induce infringement of the '225 and/or the'498 (method) patents; and (3) three cease and desist orders prohibiting Weber Aircraft, Hitco, and UOP Aerospace (domestic users of the subject inserts) from using imported inserts acquired subsequent to issuance of the orders so as to infringe the '225 and/or the '498 patents. 4/

On June 28, 1982, the President disapproved the Commission's determination pursuant to section 337(g)(2) of the Tariff Act of 1930, which authorizes the

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2/ Commissioner Haggart was not a member of the Commission at that time.

3/ Commissioner Stern found only tendency. See Certain Molded-In Sanwich Panel Inserts and Methods for Their Installation, Inv. No. 337-TA-99, USITC Pub. No. 1246, n.12 at 9.

4/ Commissioner Stern determined that the appropriate remedy for the violation found was a general exclusion order and a cease and desist order directed to the importer (TYE). She did not find that the appropriate remedy included the three cease and desist orders directed to domestic users.

Presdident to disapprove Commission determinations for domestic and foreign policy reasons. The disapproval was based solely on the President's objection to the three cease and desist orders directed to the domestic purchasers/users of the imported products under investigation. 5/ The President found the general exclusion order and the cease and desist order directed to the importer appropriate. However, as section 337 does not permit the President to partially disapprove or revise a Commission remedy, he was constrained to disapprove all of the relief issued. The President stated--

> The discriminatory effect upon imported products of the three orders directed to the users of those products forms the basis of my decision to disapprove in this case.
>
> My decision is based upon narrow grounds and does not mean that the petitioner in this case is left without legal remedies. It can pursue its rights both through the courts and the USITC. Denial of the USITC determination here does not imply there would be a rejection of another remedy which would fully protect the legitimate patent rights of the petitioner without unnecessarily discriminating against imported products. 6/

In light of the notification of disapproval, Shur-Lok Corporation (Shur-Lok), the complainant in the original Commission investigation, submitted a letter on July 1, 1982, requesting that--(1) the Commission on its own motion institute a new investigation on the basis of the unfair acts and unfair methods of competition alleged and proven in Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation, Inv. No. 337-TA-99 (Sandwich

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5/ The rationale for the President's disapproval was that the orders may result in less favorable treatment being accorded imported products than that given to domestic products.

6/ Presidential Disapproval of the Determination of the U.S. International Trade Commission in Investigation No. 337-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation (Panel Inserts Notification of Disapproval), 47 F.R. 29919 (July 9, 1982). A copy of this document is attached as appendix A.

Panel Inserts); and (2) the Commission reissue the general exclusion order and the cease and desist order directed to TYE that it issued originally.

The Commission on July 27, 1982, denied Shur-Lok's motion requesting that the Commission self-initiate a new investigation. 7/ The Commission voted instead to consider modification of its finding on remedy, pursuant to section 211.57 of the Commission Rules of Practice and Procedure (rule 211.57). On August 9, 1982, the Commission published a notice in the Federal Register seeking written comments from the parties and interested members of the public on "whether and, if so, how the Commission action . . . should be modified in light of the President's disapproval." 47 F.R. 34473 (1982). Comments were filed by complainant Shur-Lok, the President of TYE, and counsel for TYE. The Commission on September 8, 1982, voted to modify its findings on remedy, the public interest, and bonding.

Modification of a Disapproved Opinion Commission Determination 8/

Rule 211.57 provides in relevant part:

> (a) Whenever any person believes that changed conditions of fact or law, or the public interest, require that a final Commission action be modified or set aside, in whole or in part, such person may file with the Commission a motion requesting such relief. The Commission may also on its own initiative consider such action.
>
> . . . .

7/ Shur-Lok cited the Commission action in Certain Headboxes and Papermaking Machine Forming Sections for the Continuous Production of Paper, and Components Thereof, Inv. Nos. 337-TA-82 and 337-TA-82A, in support of its request. Shur-Lok noted that it did not wish to raise any new issues or violations, and requested that the matter be handled as expeditiously as possible.

8/ Commissioner Stern did not find authority for the Commission to modify in this situation and does not concur in this section of the opinion. See Additional Views of Commissioner Paula Stern at 21.

> (b) . . . After consideration of the motion, any responses thereto, or any information placed on the record at a public hearing or otherwise, the Commission shall take such action as it deems appropriate. . . . 19 C.F.R. § 211.57 (emphasis added).

An affirmative determination on violation and the action taken thereunder, disapproved by the President, is a "final Commission action" within the meaning of rule 211.57. 9/ The term "Commission action" usually refers to the Commission's findings on the appropriate remedy, public interest and bonding, and the action and order that is issued to effectuate those findings. A Commission violation determination 10/ and the action and order forwarded

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9/ Chairman Eckes and Commissioners Frank and Haggart note that, finding no language in rule 211.57 that precludes modification of a disapproved Commission determination under that rule, Commissioner Stern resorts to reading limitations into rule 211.57 from other Commission rules. Thus, Commissioner Stern finds that rule 211.56(d) and (e) prohibit the consideration of modification of disapproved Commission action under rule 211.57.

There is a difference between reading the provisions of a statute or a rule together so that a statutory scheme is administered consistently, and grafting the specific limitations of one provision onto another. Rules 210.56(d) and (e) deal only with Commission action that has been expressly or tacitly approved by the President. The fact that rule 210.56(d) defines when Commission action becomes final under certain circumstances does not prevent Commisson action from becoming final under all other circumstances. If Commissioner Stern's construction of the rules were correct, then negative Commission action would never become final, as such actions are not reviewed by the President. Yet, negative Commission action clearly becomes final, and is subject to judicial review, just as is approved affirmative action. Similarly, the fact that approved Commission action is modifiable under rule 211.57 does not prevent disapproved Commission action from being modified under the same rule.

10/ A Commission decision in a section 337 investigation where a violation is found is comprised of a determination on violation, and findings on remedy, bonding and the public interest. Section 337(g) distinguishes between the Commission determination on violation and the Commission finding on remedy. Section 337(g) provides in relevant part:

(Footnote continued)

to the President at the conclusion of a section 337 investigation represent final, not tentative, Commission action. The issuance of the Commission determination and action concludes the investigation. See 19 U.S.C. § 1337(b).

The interpretation of "final Commission action" in rule 211.57 to include an affirmative Commission determination disapproved by the President is consistent with the provisions of section 337(g)(2), 19 U.S.C. § 1337(g)(2) (1976). That section provides:

(Footnote continued)

> (g)(1) If the Commission determines that there is a violation of this section, or that, for purposes of subsection (e) of this section, there is reason to believe that there is such a violation, it shall--
>
> (A) publish such determination in the Federal Register, and
>
> (B) transmit to the President a copy of such determination and the action taken under subsection (d), (e), or (f) of this section, with respect thereto, together with the record upon which such determination is based.
>
> (2) If, before the close of the 60-day period beginning on the day after the day on which he receives a copy of such determination, the President, for policy reasons, disapproves such determination and notifies the Commission of his disapproval, then, effective on the date of such notice, such determination and the action taken under subsection (d), (e), or (f) of this section with respect thereto shall have no force or effect. 19 U.S.C. § 1337(g)(1), (2) (Supp. IV 1980) (emphasis added).

The adjective "such," when used as above, means "having a quality already or just specified--used to avoid repetition of a descriptive term . . . of the sort or degree previously indicated . . . . " Webster's Third New International Dictionary (unabridged ed. 1965). The reference to which "such determination" refers to in subsection 337(g) is clearly the Commission determination of violation. See 19 U.C.C. § 337(g)(1). If "such determination" as used in subsection 337(g) referred to the entire Commission decision in a section 337 investigation, including the Commission's finding on remedy, there would be no need for the separate references found in subsection 337(g) to the Commission "action taken under subsections (d), (e), or (f)." Subsections (d), (e) and (f) of section 337 are the subsections which authorize the Commission to find and issue the appropriate remedy. It should not be presumed that language in a statute is unnecessary or superfluous.

Other subsections of section 337 also distinguish between the Commission determination of violation and the Commission findings on remedy, public interest and bonding. See text accompanying n. 26, infra (discussing 19 U.S.C. § 1337(c)).

> If, before the close of the 60-day period beginning on the day after the day on which he receives a copy of such determination, the President, for policy reasons, disapproves such determination and notifies the Commission of his disapproval, then, effective on the date of such notice, such determination and the action taken under subsection (d), (e), or (f) of this section shall have no force or effect. 19 U.S.C. § 1337(g)(2) (emphasis added).

Section 337(g)(2) addresses the effect that Presidential disapproval has on a Commission determination and action. If "no force or effect" were intended to mean that the Commission determination and action is totally nullified and invalidated upon Presidential disapproval, then arguably there is no Commission action to modify. We do not believe that the "no force or effect" language was intended to invalidate totally the Commission determination and action. Such an interpretation is contrary to the allocation of responsibility set forth in the statute and the legislative history. We believe that the language "no force or effect" in section 337(g)(2), viewed in the context of section 337 as a whole, was intended to mean that a Commission determination, upon disapproval by the President, remains valid but will not be enforced.

An examination of U.S. statutes where the phrase "no force or effect" is used as a legal term of art, and of cases interpreting the language, shows that a plain meaning of this term does not exist. The term has widely varying uses, ranging from establishing priority between conflicting statutes or other legal instruments, 11/ to determining the effective date of a statutory provision. 12/

11/ E.g., 28 U.S.C. § 2076; 42 U.S.C. § 2151.
12/ E.g., 28 U.S.C. § 2076; 43 U.S.C. § 991.

The intended effect of the language "no force or effect" can only be determined when viewed in the context of the statutory scheme in which it is used. Accordingly, the courts have applied statutes containing the phrase consistently with the purpose of the particular statute involved. 13/

The majority's interpretation of "no force or effect" in section 337(g) comports with the intended allocation of responsibility for the administration of section 337, as set forth in the statute and the legislative history. The Senate Finance Committee Report explaining section 337(g) states:

> It is recognized by the Committee that the granting of relief against imports could have a very direct and substantial impact on United States foreign relations, economic and political. Further, the President would often be able to best see the impact which the relief ordered by the Commission may have 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. 14/
>
> Therefore, it was deemed appropriate by the Committee to permit the President to intervene before such determination and relief become final, 15/ when he determines that policy reasons require it. The President's power to intervene would not be for the purpose of reversing a Commission finding of a violation of section 337; such finding is determined solely by the Commission, subject to judicial review. S. Rep. No. 1298, 93d Cong., 2d Sess. 199 (1974) (emphasis added).

In administering his responsibilities under section 337, the President has acknowledged his limited role. In the Panel Inserts Notification of

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13/ Legislative intent has provided the touchstone for statutory interpretation. See e.g., Huff v. Metropolitan Life Ins. Co., 675 F.2d 119, 121-22 (6th Cir. 1982) (Congress intended to eliminate the "manifest intent" tests adopted in cases); Sadlowski v. United Steelworkers of America, 645 F.2d 1114 (D.C. Cir. 1981) (in enacting the Labor-Management Reporting and Disclosure Act of 1959, Congress intended to protect union members' first amendment rights); Mallick v. International Broth. of Elec. Workers, 644 F.2d 228 (2d Cir. 1981) (same).

14/ These are the same public interest considerations that the Commission is required to consider before issuing any remedy. See 19 U.S.C. §§ 1337(d)-(f).

15/ The issue of whether an affirmative Commission determination is final for purposes of rule 211.57 prior to the end of Presidential review is not presented by this case.

Disapproval, the President states, "The President is authorized by Section 337(g) to disapprove USITC determinations for policy reasons." 16/ The President has also indicated that his disapprovals were not intended to reflect on the violation determinations of the Commission. 17/

Section 337(g) makes no distinction between the effect of Presidential disapproval on a Commission determination on violation and the Commission action, i.e., the Commission findings on remedy, the public interest, and bonding. As the statute is written, Presidential disapproval has the same effect on both. As indicated above, the President does not have the authority to reverse a Commission determination on violation. If "no force or effect" were interpreted as invalidating the Commission determination and action, then the President would indeed be reversing the Commission determination on violation as well as disapproving the Commission's remedy. Such an interpretation would in effect give the President the same power of review as the U.S. Court of Customs and Patent Appeals. This allocation of authority would be contrary to the intent of Congress that the finding on violation "is determined solely by the Commission, subject to judicial review." 18/

The role of the President in reviewing Commission determinations is limited to assessing the impact of the relief on foreign policy or the public interest considerations enumerated above. The President has no authority to review the legal or factual accuracy of the Commission determination of

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16/ 47 F.R. 29919 (July 9, 1982) (emphasis added). See also Presidential Disapproval of Determination of U.S. International Trade Commission in Investigation No. 337-TA-82, Certain Multi-ply Headboxes (Headboxes Notification of Disapproval), 46 F.R. 32361 (June 22, 1981).

17/ Id.

18/ S. Rep. No. 1298, 93d Cong., 2d Sess. 199 (1974).

violation. Indeed, the President has no authority to review any portion of the Commission determination for purposes other than those specifically enumerated in subsection 337(g).

If the Commission determination and action were totally invalidated by Presidential disapproval, it would make the determination and action little more than the recommendation to the President that it was prior to the passage of the Trade Act of 1974. 19/ Such an allocation of authority under section 337 would contravene one of the most significant changes Congress made in the administration of section 337 when it enacted the Trade Act of 1974. Congress transfered to the Commission "the final authority to determine, subject to judicial review, whether section 337 has been violated," 20/ and the authority to order the appropriate remedy. The President's role under the Trade Act of 1974 is limited to "intervention" where policy considerations require it. S. Rep. No. 1298, 93d Cong., 2d Sess. 193-194 (1974).

Assuming arguendo that the language "no force or effect" did have a "plain meaning" that the relevant action or provision is rendered invalid,

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19/ We note that Commissioner Stern's primary concern appears to be the preservation of the independence of Commission determinations. It is interesting to note that her interpretation of "no force or effect," to the contrary, would undermine the independence of the Commission as well as its final authority to make a determination on violation. Commissioner Stern interprets "no force or effect" to mean that the Commission violation determination and action are nullified and invalidated upon Presidential disapproval. Under Commissioner Stern's interpretation, the "political considerations" about which she is so concerned would control Commission determinations on violation. Our interpretation of the allocation of statutory responsibility between the Commission and the President insures to the greatest degree possible that political factors do not undermine the independent factual and legal determinations made by the Commisson on the issue of violation. We disagree with Commissioner Stern that the Commission loses the ability to make an independent, objective determination after Presidential disapproval.

20/ S. Rep. No. 1298, 93d Cong., 2d Sess. 193 (1974).

that meaning would strongly conflict with the statutory scheme for administration of section 337. The Supreme Court has repeatedly found that the plain meaning of a statute is not controlling if it leads to an interpretation which is contrary to the policy underlying the statute. The Supreme Court stated in United States v. American Trucking Associations, 310 U.S. 534 (1939):

> There is, of course, no more persuasive evidence of the purpose of a statute than the words by which the legislature undertook to give expression to its wishes. Often these words are sufficient in and of themselves to determine the purpose of the legislation. In such cases we have followed their plain meaning. When that meaning has led to absurd or futile results, however, this court has looked beyond the words to the purpose of the act. Frequently, however, even when the plain meaning did not produce absurd results but merely an unreasonable one "plainly at variance with the policy of the legislation as a whole" this Court has followed that purpose, rather than the literal words. . . . Emphasis should be laid, too, upon the necessity for appraisal of the purposes as a whole of Congress in analyzing the meaning of clauses or sections of general acts. Id. at 543-544 (emphasis added).

A few years later in Harrison v. Northern Trust Co., Justice Murphy wrote the often-cited passage on the use of the plain meaning rule in statutory construction:

> But words are inexact tools at best, and for that reason there is wisely no rule of law forbidding resort to explanatory legislative history no matter how "clear the words may appear on 'superficial examination.'" United States v. American Trucking Assns., 310 U.S. 534, 543-44. See also United States v. Dickerson, 310 U.S. 554, 562.

Harrison v. Northern Trust Co., 317 U.S. 476, 479 (1942) (emphasis added).

The principles of statutory construction laid out in American Trucking and Harrison remain as valid today as they did at the time of those decisions. See e.g., Train v. Colorado Public Interest Research Group, 426

U.S. 1, 9-10; (1975); Reed v. The Yaka, 373 U.S. 410, 414-415 (1962). (espousing the same principles).

The principles above have also been consistently espoused by the federal circuit courts. 21/ Judge Learned Hand cogently explained the necessity of looking beyond the words of a statute in a Second Circuit decision which was affirmed by the United States Supreme Court:

> Of course it is true that the words used, even in their literal sense, are the primary, and ordinarily the most reliable, source of interpreting the meaning of any writing: be it a statute, a contract, or anything else. But it is one of the surest indexes of a mature and developed jurisprudence not to make a fortress out of the dictionary; but to remember that statutes always have some purpose or object to accomplish, whose sympathetic and imaginative discovery is the surest guide to their meaning.

Cabell v. Markham, 148 F.2d 737, 739 (2d Cir.) aff'd, 326 U.S. 404 (1945).

In light of the above, we believe that the only proper interpretation of subsection 337(g)(2) is that upon Presidential disapproval, an affirmative Commission determination, although valid, will not be enforced. As the Commission determination remains valid, it can be modified where the Commission finds such action appropriate. 22/ 23/

21/ E.g., Ambook Enterprises v. Time, Inc., 612 F.2d 604 (2d Cir. 1979); Doyon, Ltd. v. Bristol Bay Native Corp., 569 F.2d 491, 494-495 (9th Cir. 1978); Lange v. United States, 443 F.2d 720, 722-723 (D.C. Cir. 1971); United States v. Cavell, 294 F.2d 12, 15 (3d Cir. 1961); United States v. Ivey, 294 F.2d 799, 803 (5th Cir. 1961).

22/ We note that Commissioner Stern voted against modification because of her belief that the Commission has no authority to modify a disapproved determination. She nonetheless acted pursuant to this authority by participating in the Commission vote on how to modify the remedy in this case.

23/ There are several sources of the Commission's authority to modify its final actions under rule 211.57. The Commission has express statutory authority to modify its cease and desist orders "at any time." 19 U.S.C. § 1337(f)(1) (Supp. IV 1980). Neither the statute nor the legislative history contains any language that qualifies this broad grant of power to the Commission to modify cease and desist orders. The C.C.P.A. in SSIH Equipment

(Footnote continued)

Comments Received in Opposition to Modification

TYE in its comments raised three main objections to Commission modification of the order in this case. First, TYE claims that the Commission is without jurisdiction to make any determination because it is now past the one year deadline for conclusion of the investigation required by section 337(b). The investigation has already been concluded within the one-year deadline. The statutory time limits for the conclusion of an investigation in section 337(b) are not applicable to a review of that determination. The CCPA in SSIH Equipment S.A. v. United States International Trade Commission, 213 U.S.P.Q. 529 (C.C.P.A. 1982), implicitly ruled that the authority to review final Commission action under rule 211.57 is not precluded by the one-year statutory deadline for conclusion of the investigation. The appellants in SSIH Equipment appealed the denial by the Commission of a motion filed under rule 211.57 to reopen the record of Certain Large Video Matrix Display Systems and Components Thereof, Inv. No. 337-TA-75, USITC Pub. No. 1158 (June 1981). At the time of the request for modification, the investigation had been concluded within the statutory deadline and the deadline had expired. In the SSIH Equipment opinion, the Court approved the Commission's authority under rule 211.57 to revoke or modify its determinations. In approving the

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(Footnote continued)
S.A. v. United States International Trade Commission, 213 U.S.P.Q. 529 (C.C.P.A. 1982) found that 19 U.S.C. § 1337(h) provides statutory authority for modification of exclusion orders and cease and desist orders under rule 211.57. The C.C.P.A. in SSIH Equipment further found that "the Commission has the inherent authority to modify its determinations." Id. at n. 6 (emphasis added). See Permian Basin Area Rate Cases, 309 U.S. 747, 784 (1968) (ruling that administrative authorities not only have the right but the responsibility to correct errors or appropriately modify determinations as circumstances require).

Commission's authority to review its determinations under rule 211.57, the Court a fortiori ruled that such review after the conclusion of the investigation and the expiration of the statutory deadline is permissible. In addition, the Court noted--

> Unlike a district court which operates under no statutory limitation as to the length of a trial, by statute the Commission is required to "conclude any such investigation, and make its determination [no later than] 18 months . . . after the date of publication of notice of such investigation." 19 USC 1337(b)(1). The Commission is without authority to extend the time for concluding and/or rendering a determination on the initial investigation. We do agree, however, that the Commission has the inherent authority to review its determinations. SSIH Equipment S.A. v. United States International Trade Commission, 213 U.S.P.Q. 529 (C.C.P.A. 1982).

In arguing that modification is barred by the one-year deadline, TYE alleged that--

> [t]he circumstances have changed in the industry since May, 1981. As of May, 1981, The Young Engineers was importing virtually all of its inserts from Japan. Subsequent to May, 1981, the (sic) Young Engineers increased its domestic procurement of inserts and phased out their importation. No inserts have been imported by The Young Engineers since January 1982.

This does not refute the appropriateness of modifying the Commission action in this case. The facts that TYE submits as changed circumstances occurred during the course of the investigation, and respondent TYE had ample opportunity to present those facts at that time. 24/

24/ TYE chose not to litigate the violation issue at the ALJ level, once it lost on the issue of res judicata. It did, however, appear at the Commission hearing to submit oral and written testimony on the issues of remedy, public interest, and bonding. TYE made this same allegation in the "Conclusion" paragraph of its posthearing brief to the Commission. TYE stated: "TYE began obtaining small numbers of inserts from domestic sources in 1979 and has recently stopped importation in favor of total reliance on domestic sources." TYE Posthearing Brief at 14. It provided no information in support of this allegation, nor did TYE argue this point further to the Commission. Moreover, TYE did not then and does not now allege that TYE has no intention of resuming importations in violation of section 337 if no order were entered.

TYE further alleges that the record is out of date because--

> [t]he commercial jet transportation industry, primarily Boeing, has recently been convulsed by a rush of order cancellations and deferrals which impact on the procurement and use of the inserts in question.

The statement, as submitted, is no more than an unsubstantiated allegation. Moreover, TYE provides no explanation of how this information, if established as a fact, would have materially affected the Commission's determination in this case.

TYE additionally claims that the Commission lacks jurisdiction over the matter because TYE is no longer importing the subject merchandise. As noted above, that occurred during the course of the investigation. The fact that TYE alleges that it is no longer importing the infringing imports does not defeat the Commission's jurisdiction over a section 337 cause of action. Jurisdiction vests at the institution of an investigation. 25/ It does not terminate upon the cessation of the unfair act. Indeed, if that were the case, any respondent could defeat Commission section 337 jurisdiction prior to the conclusion of an investigation by ceasing importation of the subject merchandise, avoid the consequences of the violation, and then begin importing again once the 337 investigation was terminated.

25/ The general rule that, if jurisdictional prerequisites are satisfied when the suit is begun, subsequent events will not work an ouster of jurisdiction is not attributable to any specific statute or any language which confers jurisdiction. Rather, it represents a well-established policy in U.S. jurisprudence that the sufficiency of jurisdiction should be determined once and for all at the threshold and, if found to be present, should continue until final disposition of the action. This approach provides maximum stability and certainty to the viability of the action and minimizes repeated challenges to subject matter jurisdiction. 13 Wright, Miller, & Cooper, Federal Practice and Procedure, § 3608 at 656 (1975); Dery v. Wyer, 265 F.2d 804, 808 (2d Cir. 1959).

TYE's third objection to modification is that the procedure that is being used denies TYE due process. TYE contends that any determination under section 337, including a determination to modify, must be made on the record after notice and opportunity for hearing in conformity with the provisions of subchapter II of chapter 5 of Title 5, pursuant to section 337(c). Section 337(c) provides in relevant part:

> Each determination under subsection (d) or (e) of this section shall be made on the record after notice and opportunity for a hearing in conformity with the provisions of subchapter II of chapter 5 of Title V. 19 U.S.C. § 1337(c).

The only "determination" referred to in subsections 337(d) and (e) are determinations on violation. Congress uses the word "finds" with respect to the Commission decisions on the appropriate remedy and the public interest. 26/ Accordingly, since the enactment of these amendments to section 337 in 1974 (effective Jan. 1, 1975), the Commission has interpreted section 337(c) as requiring a trial-type hearing only for its determination on the violation of section 337. As the Commission has never provided a trial-type hearing for its findings on remedy, there is no reason why it should do so when considering modification of a remedy. Moreover, this is a review of action taken under section 337, not an initial investigation. Thus, the provisions of section 337(c) do not perforce apply.

None of TYE's objections provide a basis for not modifying the order as requested by the complainant.

26/ Cf. 19 U.S.C. § 1337(f)(1). This provision authorizes the Commission to find that a cease and desist order is an appropriate remedy. However, the pertinent language of section 337(c) makes no reference to section 337(f). If TYE's interpretation were correct, section 337(c) would yield the anomalous result of requiring a trial-type hearing where the Commision issues exclusion orders, but not requiring such a hearing for the issuance of a cease and desist order.

Remedy

In light of the factors requiring modification of our determination in Sandwich Panel Inserts, we conclude that the appropriate remedy for the violation existing in this investigation is: 1) a general exclusion order prohibiting importation of articles which infringe the '015 product patent, and 2) a cease and desist order prohibiting TYE from selling imported inserts acquired subsequent to the institution of the investigation where such sales would contribute to or induce infringement of the '225 and/or '498 method patents.

Shur-Lok requested this relief in its motion for a new investigation and in its comments filed on the proposed modification of the order. This remedy will prevent infringement of the product patent by imported inserts and eliminate the source of supply of acticles contributing to or inducing the infringement of the '225 and '498 method patents. Market conditions such as low barriers for entry into the industry and a stable U.S. demand sufficient to induce new foreign entrants warrant a general exclusion order. Furthermore, U.S. firms using inserts could be capable of arranging for the manufacture of the infringing article abroad.

Although a Commission determination that a violation of section 337 exists does not automatically result in the entry of a remedy, see Certain Inclined-Field Acceleration Tubes, Inv. No. 337-TA-67, USITC Pub. No. 1119 (1980); Certain Automatic Crankpin Grinders, Inv. No. 337-TA-60, USITC Pub. No. 1022 (1979), we believe that the complainant should be granted appropriate relief in this case. The Commission has a responsibility under the statute to provide effective relief when a violation of section 337 is found to exist if

an effective remedy that does not contravene the public interest is available. 19 U.S.C. § 1337(d), (f). The relief, as modified, satisfies this mandate.

Public Interest

Public interest considerations have not changed since the initial consideration of the matter. The question of national defense and the domestic industry's ability to supply the U.S. demand remains unchanged. The domestic industry is fully able to satisfy the U.S. demand for inserts. Although the inserts are the most practicable method for installing panels, they are not essential to aircraft construction. Other methods for installing panels are available. Thus, the remedy does not adversly affect the public health and welfare.

Bonding

We find that the bond during the Presidential review period should be set at 173 percent of the entered value of the articles concerned. 27/ 28/ This represents a comparison of the 1981 average cost to Shur-Lok to manufacture its SL 607 series inserts with the average cost to TYE of equivalent inserts.

27/ This new action must be submitted to the President pursuant to 19 U.S.C. § 1337(g)(1)(B). Although the President has had an opportunity to review the Commission's determination on violation for any policy objection, he has not had an opportunity to review the Commission's new finding on remedy and the action and order issued thereunder. 19 U.S.C. § 1337(g)(3) requires that the Commission set a bond under which subject merchandise can enter the United States during the Presidential review period.

28/ Commissioner Stern feels that 19 U.S.C. § 1337(g)(3) is not applicable in a situation where the Commission is modifying a prior determination which has been through the process of referral to the President under 19 U.S.C. § 1337(g)(1) and (2).

This amount is necessary to offset the competitive advantage resulting from the unfair act. S. Rep. No. 1298, 93d Cong., 2d Sess. 198 (1974). It is also the bond originally determined by the Commission in this investigation.

ADDITIONAL VIEWS OF COMMISSIONER PAULA STERN

Reiterating my remedy and public interest votes of March 18, 1982, 1/ now apparently places me in the majority on these issues. However, the procedural context of this decision is a cause of concern to me. The situation faced in this investigation is the same as in Certain Headboxes and Papermaking Machine Forming Sections for the Continuous Production of Paper, and Components Thereof, Inv. No. 337-TA-82A, where the Commission followed a completely different, although equally problematical, procedure. 2/ I pointed out in Headboxes that this problem of the President disapproving the particular remedy selected by the Commission and not a remedy in general is a difficult one. If the solution to this problem requires the contravention of the clear intent of Congress that we make independent and objective determinations, we are prevented from resolving it.

1/ Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation, Inv. No. 337-TA-99, p. 21, n. 33 (May 1982).

2/ Certain Headboxes and Papermaking Machine Forming Sections for the Continuous Production of Paper, and Components Thereof, Dissenting Opinion of Commissioner Paula Stern, Inv. No. 337-TA-82A (November 1981).

Congress has left us with two competing policy objectives. On the one hand, we must vigilantly maintain the integrity of the system by which we reach determinations free from political input. And on the other hand, we are responsible for providing relief to parties who have been or are likely to be substantially injured by an unfair act. This dilemma arises when the President rejects the objective, independent remedy selected by the Commission. In Headboxes, I determined that until Congress directs otherwise, maintaining the integrity of the process took precedence over the equitable claims of a complainant in a particular case. I reach the same conclusion in this investigation. However, there is irony in the fact that the remedy recommended by the President and adopted now by the Commission is exactly the remedy which I originally determined was most appropriate.

In addition to the above policy concerns, I also find the legal basis for the procedure followed by the Commission in this investigation even more tenuous than those advanced by the Commission in Headboxes. I believe that the Commission possesses neither statutory nor inherent authority to modify a determination following Presidential disapproval. Section 337(g)(2) denies any effect whatsoever to a disapproved order, thus precluding such modification under the statute or section 211.57 of the Commission's Rules of Practice and Procedure. 46 F.R. 17533, Mar. 18, 1981; to be codified at 19 C.F.R. 211.57.

Modification of a Disapproved Commission Determination

I am unable to concur in the majority's reasoning regarding authority to modify a disapproved determination. Section 337 is uncharacteristically clear on this issue. The sole express reference to the effect of Presidential disapproval is contained in section 337(g)(2), which provides that upon disapproval "such determination and the action taken under subsection (d), (e), or (f) of this section with respect thereto shall have no force or effect." 19 U.S.C. 1337(g)(2) (Emphasis added.) Thus, the only express reference to disapproved determinations not only fails to provide for modification but states that a disapproved determination shall be given no force or effect.

The phrase "no force or effect" means not only that the determination should not be enforced, but also that the disapproved determination should not be given any effect. The majority correctly points out that this phrase is used within statutes in varying contexts. However, in the statutory situations analogous to section 337, the phrase is consistently used to preclude any prospective effect for statutes or other provisions, such as 337 determinations. 3/ The majority is also correct that there is no consistent meaning for this phrase as a legal term of art.

3/ See, e.g., 28 U.S.C. 2076 (superceded provisions denied future effect; 42 U.S.C. 2151 (provisions of subchapter denied prospective effect if they conflict with international agreements).

However, its plain meaning in the context of section 337 is clear. Thus, the language "no force or effect" in section 337(g)(2) precludes modifications of Commission determinations rejected by the President.

The majority goes on to argue that there is a distinction to be made between the Commission determination as to violation and the determination on relief, the public interest, and bonding. However, even if such a distinction existed for the analysis of this situation, both the statute and the legislative history are clear that both portions of our determination are covered by the "no force or effect" language. The Senate Finance Committee states:

> The President would then notify the Commission of his disapproval, and on the date of such notice, the determination and the action taken with respect to it would have no force or effect. (Emphasis added.) 4/

In addition to the absence of express authority to modify a disapproved determination, implied authority to modify such a determination is also precluded when section 337 is considered in its entirety. The various provisions of section 337 should be read in conjunction with each other and not in isolation. Thus, section 337(g)(2) must color the interpretation of other provisions of the statute. For example, section 337(f) provides that the Commission "may at any time . . . modify or revoke" a cease and desist order. This provision contains no express limits upon the Commission's authority to modify these orders. However, reading this provision in conjunction with section 337(g)(2) it seems clear that subsection (f) applies to approved determinations which are in effect.

4/ S. Rep. No. 93-1298, 93d Cong., 2d Sess., 198-99 (1974).

The majority seems to think that giving "no force or effect" to a disapproved determination is in someway contradictory to the Commission's "final authority to determine, subject to judicial review, whether section 337 has been violated." 5/ However, the President is prohibited from disapproving determinations based on violation issues. This prohibition continues in effect. Thus, the 1974 Congressional intent that the Commission have the final say on violation is left undisturbed by my reading of the law.

The Commission's Rules of Practice and Procedure implement the statute and are an additional indication that modification should not apply to disapproved determinations. The majority argues that rule 211.57 covers the situation we face here. However, rule 211 articulates Commission enforcement procedures and logic dictates that there can be no enforcement of a disapproved determination. Further, we should consider rule 211.57 in conjunction with rule 210.56(d)-(e). 46 F.R. 17531, Mar. 18, 1981; to be codified at 19 C.F.R. 210.56(d)-(e). This is because rule 210.56(e) on the implementation of Commission actions references us to Subpart C of rule 211. Rule 210.56(d)-(e) discusses when an affirmative Commission action becomes final. An affirmative determination becomes final after express approval or after expiration of the sixty-day Presidential review period if no action has been taken by the President. Rule 210.56(d) clearly does not apply if the President disapproves an affirmative Commission determination. Under rule 210.56(e), only final Commission actions are affected by Subpart C of Part 211, specifically rule 211.57. Thus, rule 211.57 explicitly does not apply to Commission orders which have been disapproved by the President.

5/ S. Rep. No. 93-1298, 93d Cong., 2d Sess., 193 (1974).

The Court of Customs and Patent Appeals' recent interpretation of section 337(h) also supports the requirement that there be an approved determination for application of rule 211.57. 6/ Section 337(h), dealing with the duration of Commission orders, provides that exclusion orders and cease and desist orders "shall continue in effect until the Commission finds . . . that the conditions which led to such exclusion from entry or order no longer exist." (Emphasis added.) 19 U.S.C. 1337(h). The C.C.P.A. stated in SSIH that rule 211.57 "essentially implements the requirements of 19 U.S.C. 1337(h)." 7/ The case before the Court involved an approved determination currently in effect. Because determinations disapproved by the President have never become effective, such determinations cannot "continue in effect."

The statutory context of section 337 and Congress's intent in enacting this provision indicate that the Commission should not modify disapproved determinations. Although the Commission may possess inherent authority to modify approved determinations, modification of disapproved

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6/ See SSIH Equipment S.A. v. United States International Trade Commission, 213 U.S.P.Q. 529, 530 n.6 (1982).

7/ Id.

determinations would necessarily inject political considerations into the Commission's decision-making process. This is clearly contrary to Congress's intention in enacting section 337. Congress intended to establish a procedure independent from those pressures exerted by the executive branch of government. Even if the Commission rejected the remedy requested by the President, it would make that decision on the basis of a record that contains political input. Furthermore, modification of determinations undercuts Congress's desire for expeditious final determinations. Continual revision of even disapproved determinations would cloud the certainty of the outcome of any investigation.

The Commission, thus, lacks express statutory authority for modification of a disapproved order. Furthermore, the statutory scheme and the Commission's rules require that the Commission give no effect to these disapproved determinations. This interpretation is consistent with Congress's intent in providing a depoliticized forum for these investigations.

Although I agree with the Commission's modified remedy (it is the remedy that I originally supported) 8/, the Commission, as a body, cannot adopt this remedy and remain consistent with its initial reasoning

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8/ Supra n.1.

in this case. The Commission obviously felt in May of this year that the three cease and desist orders against domestic users were necessary to accord relief to the domestic industry. There has been no change of fact supporting the conclusion that a lesser remedy will provide that relief.

Conclusion

I reiterate my original determination as to relief, the public interest and bonding. The Commission does not have the authority to modify a remedy disapproved by the President. However, I have no reservations in endorsing the remedy the President is willing to accept and which the Commission has now delivered to him as it is the remedy of my original determination.

APPENDIX A

Practice, Internal Revenue Service, until such regulations are amended to reflect this change. Existing provisions in regulations concerning appeals from recommended decisions of the Director of Practice to the Secretary shall remain in full force and effect.

The duties of the Director of Practice performs pursuant to 31 CFR Part 15, Post-Employment Conflict of Interest, remain with the General Counsel. References in that Part to the Director of Practice shall be considered to be references to the General Counsel, or his or her designee, until these regulations are amended.

James I. Owens,

Acting Commissioner.

[FR Doc. 82-18638 Filed 7-8-82; 8:45 am]

BILLING CODE 4830-01-M

Office of the Secretary

[Supp. to Dept. Circular, Public Debt Series—No. 17-82]

Series E-1989 Notes; Interest Rate

July 2, 1982.

The Secretary announced on July 1, 1982, that the interest rate on the notes designated Series E-1989, described in Department Circular—Public Debt Series—No. 17-82 dated June 23, 1982, will be 14½ percent. Interest on the notes will be payable at the rate of 14½ percent per annum.

Paul H. Taylor,

Fiscal Assistant Secretary.

[FR Doc. 82-18537 Filed 7-8-82; 8:45 am]

BILLING CODE 4810-40-M

OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE

Presidential Disapproval of the Determination of the U.S. International Trade Commission In Investigation No. 337-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation

On June 28, 1982, the President notified the Chairman of the United States International Trade Commission of his disapproval of the determination of the Commission in Investigation No. 337-TA-99, Certain Molded-In Sandwich Panel Inserts and Methods for Their Installation. Following is the text of the President's determination.

William E. Brock,

United States Trade Representative.

Disapproval of the Determination of the United States International Trade Commission in the Matter of Certain Molded-In Sandwich Panel Inserts And Methods for Their Installation

The United States International Trade Commission (USITC), following a finding of a violation of Section 337 of the Tariff Act of 1930, as amended, has ordered excluded from entry into the United States imports of molded-in sandwich panel inserts (panel inserts) that were held to infringe U.S. Letters Patent No. 3,182,015, until that patent expires in November of 1983. A cease and desist order was issued to the importer of the panel inserts prohibiting it from contributing to or inducing the infringement of U.S. Letters Patent Nos. 3,392,225 and 3,271,498 which cover processes by which panel inserts are installed. Finally, the USITC issued cease and desist orders to three purchasers of the imported panel inserts directing them not to use imported panel inserts to practice the methods covered by the process patents until the second of those patents expires in July of 1985.

The President is authorized by Section 337(g) to disapprove USITC determinations for domestic or foreign policy reasons. The statute does not authorize partial disapprovals or changes in the remedies. I have notified the USITC today of my decision to disapprove its determination in this case.

The effect of the cease and desist orders directing the three purchasers not to use imported products when practicing a process in the United States that infringes a process patent may not be in compliance with U.S. international obligations. The orders may result in less favorable treatment in requirements affecting purchase and use being accorded imported products than the treatment being accorded domestic products. The three orders do not stop the infringement of the process patents in the U.S. Because of the statutory limits on USITC jurisdiction, those orders can only act as restrictions on the purchase and use of the imported products.

My disapproval of the USITC determination in this case in no way circumscribes the USITC authority to issue cease and desist orders. Cease and desist orders are more flexible remedies than enclusion orders and are appropriate in cases where an importer is the wrongdoer. The discriminatory effect upon imported products of the three orders directed to the users of those products forms the basis of my decision to disapprove in this case.

My decision is based upon narrow grounds and does not mean that the petitioner in this case is left without legal remedies. It can pursue its rights both through the courts and the USITC. Denial of the USITC determination here does not imply there would be a rejection of another remedy which would fully protect the legitimate patent rights of the petitioner without unnecessarily discriminating against imported products.

The exclusion from the U.S. market of products which infringe U.S. patents or the issuance of cease and desist orders preventing the importation, advertising or sale of such infringing products is an entirely appropriate use of Section 337 because of the practical difficulties in achieving workable remedies in our courts. A narrowly drafted cease and desist order such as that issued to the importer in this case also is appropriate. Where, as here, however, adequate remedies are available under U.S. law which do not discriminate between foreign and domestic products in preventing infringement of U.S. process patents, I must defer the American judicial system.

[FR Doc. 82-18542 Filed 7-8-82; 8:45 am]

BILLING CODE 3190-01-M

Implementation of Duty Concessions of Certain Television Receiver Components and Printed Circuit Boards

Correction

In FR Doc. 82-17475 appearing on page 28201 in the issue of Tuesday, June 29, 1982, make the following correction:

In the table at the bottom of page 28201, the TSUS item now reading "658.16" should have read "685.16".

BILLING CODE 1505-01-M

July 9, 1968 C. S. PHELAN 3,392,225

METHOD FOR INSTALLING MOLDED-IN INSERTS IN SANDWICH PANELS

Filed June 21, 1965

FIG. 1.

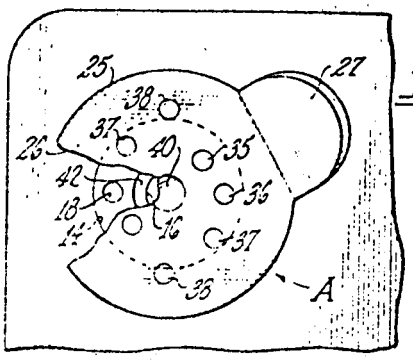


FIG. 2.

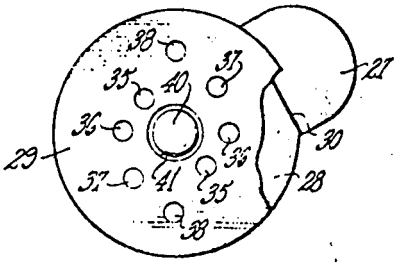


FIG. 3.

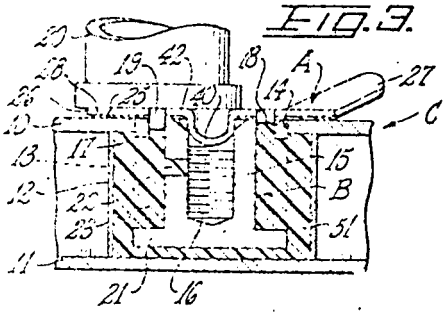


FIG. 4.

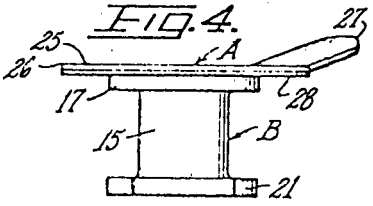


FIG. 6.

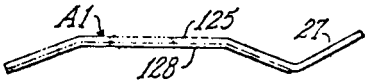


FIG. 8.

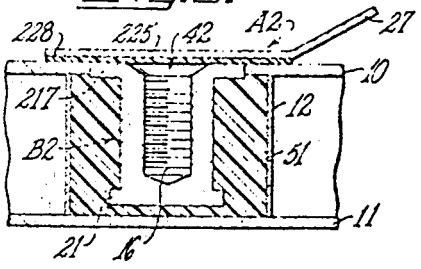


FIG. 7.

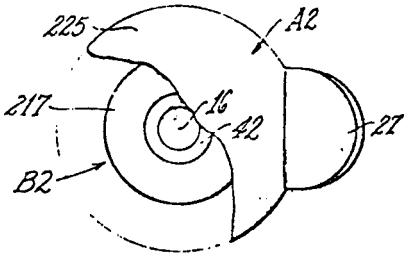


FIG. 9.

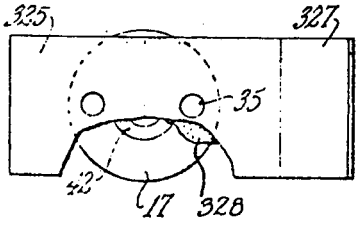
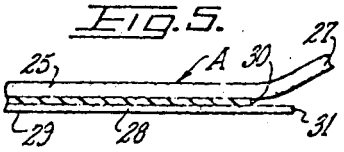


FIG. 5.



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United States Patent Office

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3,392,225

METHOD FOR INSTALLING MOLDED-IN INSERTS IN SANDWICH PANELS

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Filed June 21, 1965, Ser. No. 465,684
4 Claims. (Cl. 264—262)

ABSTRACT OF THE DISCLOSURE

Disclosed herein is a method of installing a fastener insert in a hole in a lightweight sandwich panel, utilizing a holder comprising an adhesive-coated plate which is first adhered to the end of the insert with portions of the holder, including their adhesive-coated faces projecting beyond the sides of the insert; the insert is then placed in the hole with the projecting portions bridging across the mouth of the hole, and the adhesive faces of these projecting portions are adhered to the panel at the margin of the hole so as to hold the insert in position in the hole while uncured potting compound is injected past the holder into the hole and is subsequently hardened into a rigid anchoring body securing the insert in the hole.

This invention relates to the installation of fastener inserts in lightweight sandwich panel structure such as is used in the interior walls of airplane cabins, and has as its general object to provide an improved method for positioning and holding an insert in a bored hole in a sandwich panel during injection of potting compound into the hole and hardening of the compound to provide a secure anchorage for the insert.

Various methods and means for installing molded-in inserts have heretofore been proposed and tried, and some of them have been extensively used, but various problems and difficulties have been found to exist with respect to all of the prior methods. An early method was to inject a measured quantity of potting compound into the panel hole, and to then press the insert into the body of compound, causing it to extrude upwardly around the insert and to fill the hole. Skill and care were required in the use of this method in order to position the outer end face of the insert flush with the outer surface of the panel and with the axis of the insert exactly normal to said outer panel surface. The requirement for positioning the insert axis at right angles to the panel surface is an exacting one, since if the installed insert is tilted with respect to the panel, it will be impossible to insert a fastener bolt in a proper position normal to the plane of the panel.

Subsequent improvement utilized a pair of apertures in the insert head, one for reception of the nozzle of an injection gun and the other for bleeding out of the panel hole the air displaced by the entering compound. In an early use of this method, means was provided to attach the insert to the injection nozzle, and the injection gun was used as a tool to position the insert, but this required holding the gun against the insert until the potting compound was sufficiently set to hold the insert in the position imparted to it by the gun, and thus the method was too slow to be fully satisfactory. A subsequent improvement involved the provision of integral means on the head of the insert to temporarily secure it to the skin sheet of the panel for injection of potting compound and subsequent holding of the insert in the proper position permitting the gun to be immediately withdrawn, and this was found to be a distinct improvement over the prior methods. A general object of the present invention is to obtain equally satisfactory positioning of the insert without the necessity for forming the periphery of the insert head with temporary holding means.

Another method that has been tried is to use a temporary attachment device of plastic material resembling a collar button having a stud portion adapted to be threaded into the insert and a flat radially projecting collar for seating against the outer surface of the panel, but such devices have involved a number of problems, including the time involved in threading the stud into the insert and later unthreading it so as to remove the attachment device; the possibility of twisting off the stud and having it remain as an obstruction in the insert bore; the possibility of error on the part of the workman in failing to screw the fastener stud full depth into the insert so as to bring the locating collar into flush engagement with the end face of the insert, resulting in the insert being installed below the surface of the panel; and the possibility of the exothermic reaction of the potting compound, during hardening, causing the body of compound to expand and to lift the locating collar away from contact with the panel, thus causing the insert to be installed above the surface of the panel.

The principal object of the invention is to provide a method for installing molded inserts, avoiding the various problems and objections characteristic of the earlier methods and devices. Toward the attainment of this general object, the invention provides an attachment device:

(1) Of extremely inexpensive construction, adapted to be discarded after one use thereof;

(2) Adapted to provide a temporary attachment of the insert to the panel with a minimum expenditure of time on the part of the workman;

(3) Providing an attachment such as to avoid the possibility of installing the insert either below or above the surface of the panel;

(4) Providing an attachment which will temporarily secure the insert to the panel against either pulling away from the attachment device into the panel hole or being thrust out of the panel hole by expanding potting compound;

(5) Accommodating the injection of compound and the escape of displaced air through apertures in the insert head during the injection of the compound;

(6) Instantaneously removable after the compound has set around the insert.

Other objects and advantages will become apparent in the ensuing specification and appended drawing in which:

FIG. 1 is a plan view of a temporary installation device embodying the invention and illustrating the use of the same in positioning an insert in the hole of a sandwich panel, a portion of the installation device being broken away to show the insert therebeneath;

FIG. 2 is an inverted plan view of the installation device of FIG. 1 with a portion of the adhesive covering removed to show the adhesive therebeneath;

FIG. 3 is a transverse sectional view of a sandwich panel with an insert being temporarily held in position in a hole therein during injection of potting compound;

FIG. 4 is a side elevational view of an insert with the device of the invention attached thereto preparatory to installation in a sandwich panel;

FIG. 5 is a fragmentary sectional view of the installation device on an enlarged scale;

FIG. 6 is a side elevational view of a modified form of the installation device utilized in positioning an insert in a panel having a surface that is not flat;

FIG. 7 is a plan view of an installation device embodying another modified form of the invention, partially broken away to show an insert attached thereto;

FIG. 8 is a transverse sectional view of the installation device of FIG. 7 illustrating its use in installing an insert in a sandwich panel; and

FIG. 9 is a plan view of an installation device embodying a further modified form of the invention, partially broken away to show an insert attached thereto.

Referring now to FIGS. 1-5 of the drawing in detail, I have shown therein as an example of one form in which the invention may be embodied, an installation device consisting of a holder A adapted for use in positioning an insert B of the type having apertures in its head for the injection of potting compound, into a sandwich panel C of a well known type comprising a pair of skin sheets 10 and 11 secured to the opposite faces of a low-density honeycomb core 12 consisting of a plurality of strips of metal foil or other thin lightweight material which have been formed by bending and then attached together so as to provide a plurality of honeycomb cells extending transversely to the sheets 10 and 11. In preparation for the installation of an insert, a hole 13 is bored or punched through at least one of the skin sheets (e.g. sheet 10 as shown) and through the core 12 and (in most cases) having one end closed by the skin sheet 11 providing a bottom therefor.

The insert B shown in FIG. 3 is of a well known type comprising a tubular body 15 which may have either a threaded, closed bottom bore 16 therein or in, alternatively, a smooth cylindrical bore extending through both ends of the insert so that a bolt may be passed entirely through the panel and through the insert. The insert B has an outer end provided with a radial flange-like head 17 (FIG. 2) contoured to fit snugly within the opening 14 in the skin sheet 10 which constitutes the outer end of the hole 13, and having therein a pair of apertures 18 one of which is adapted to bleed air from the hole 13 while the other one is adapted to receive the nozzle 19 of an injection gun 20 through which potting compound 21 is injected into the hole 13. At this point it may be noted that the hole 13, where it passes through the core 12, is defined by the cut or curled-over edges of the thin honeycomb walls of the core, and that the undisturbed residual portions of the cell walls around the hole will be largely positioned radially outwardly of the cut or bent edges of the cell walls which define the hole, whereby such residual portions of the cells will define pockets extending beyond the diameter of the hole 13 and which become filled with peripheral portions of the body of potting compound which extend beyond the margin of skin sheet aperture 14, thus securely locking the anchoring body within the panel. The insert B further includes an inner end provided with a non-circular head 21 or other equivalent means providing torque-anchorage of the insert in the body of potting compound to resist rotation of the insert when a stud or other threaded device is screwed into the threaded hole 16. The insert may also include a suitable thread-lock device 22 which however has no bearing upon the present invention.

The holder A comprises an attachment body or bridge 25 of thin sheet material which is preferably in the form of a circular disc as shown, conforming to the periphery of the insert head 17 but of greater diameter so as to provide a projecting marginal portion 26; together with an integral tab 27 extending from one side of the bridge 25 and adapted to be grasped between a thumb and finger for manipulating the device. In order to facilitate grasping the tab 27, it is preferably bent at a dihedral angle with reference to attachment body 25 as shown best in FIG. 4, although it is possible to have the tab 27 disposed in the plane of the body 25 in which case it can be lifted by inserting a finger-nail or a knife blade beneath it.

The under surface of the bridge 25 is provided with a coating of pressure-sensitive adhesive 28 of a tenacious character such as to provide an attachment of good holding power. The central area of this adhesive is applied to the end face of the insert head 17, to securely attach the bridge to the insert, and the peripheral area of adhesive covering the marginal portion 26 of the bridge 25 is adapted to provide a strong attachment to the skin sheet 10 of the panel which will resist outward displacement of the insert by exothermic expansion of the body of potting compound 21.

The adhesive coating 28 is covered by a removable cover sheet 29 which is stripped off in preparation for using the device. Adhesive coating 28 is preferably of the same areas as the body 25, having a chordal side 30 where it joins the tab 27. The cover sheet 29 can be fully circular, thus having a small area thereof projecting beyond the chordal margin 30 at 31, so as to make it easy for the thumbnail to be inserted between the projecting portion 31 and the tab 27 to facilitate grasping the edge of the cover sheet 29 for stripping it away from the adhesive coating 28.

A plurality of pairs of apertures 35, 36, 37 and 38 are punched through the bridge 25 and the adhesive coating 28, in positions adapted to register with the apertures 18 of inserts B of varying sizes, the apertures of each pair being spaced equidistantly on opposite sides of the axis of the insert on a diameter thereof, the apertures 35 being of minimum spacing and the apertures 36, 37 and 38 being successively increased in spacing so as to provide for use with inserts in a range of sizes between relatively small and relatively large.

In the particular arrangement shown, the apertures of successively greater spacing are arranged in groups spiraling outwardly from the center of the device, with the apertures of successively greater spacing being arranged in corresponding succession in the groups. Other selected arrangements, without necessarily having the arrangement of increased spacing correspond to the arrangement of successive in a group of apertures, can be employed. The invention contemplates the possibility of utilizing an attachment bridge having a single pair of apertures or having 2, 3, 4 or more pairs, although an arrangement approximately as shown is preferred in order that a single device may be adapted for use with at least four different sizes of inserts. A group of apertures of one range of spacing can be utilized in an installation device and a second installation device, which can be of a different size, can be utilized for a group of apertures having a different range of spacing.

The aperture pattern 35–38 can be either no apertures at all, one, two or a plurality arranged in a manner to provide the optimum number of aperture patterns in a single installation device.

The bridge 25 is preferably provided with a pilot dimple 40 in its center and in centered relation to the groups of apertures 35–38 on respective sides thereof, for locating reception in the outer end of threaded hole 16 (normally having a countersunk thread lead 42) thus centering the bridge in coaxial relation to insert B and making it possible to register the proper pair of apertures 35–38 with the insert apertures by rotating the installation device A around the pivotal connection thus established. Dimple 40 can project through a central opening 41 in the cover sheet 29 (FIG. 2). The dimple will engage the hole 16 or thread lead 42 of the insert and is of a suitable size such as will preclude intimate dragging contact between the insert head and the adhesive surface which would cause interference with the rotational adjustment of the device for aperture alignment, but will yield to pressure forcing it into hole 16 and the bridge 25 into secure adhesive attachment to the insert head. Alternatively, the bridge can be uniformly flat and undimpled, as in the installation device A2 of FIG. 8.

While the attachment bridge 25 is fabricated of relatively thin material within the range of thicknesses commonly designated "sheet," and much thinner than the materials commonly designated as "plate," the area of the body is sufficiently small (corresponding to the relatively small end area of the average insert) so that the body as a whole is relatively rigid and not easily bent. To designate these characteristics in the appended claims, in preference to utilizing the board general term "body" I have used in the appended claims the terms "bridge" and "plate form" to indicate that the attachment body is relatively stiff and resistant to bending and is of substantially uniform

thickness throughout its area and yet has a relatively large face area in comparison to its thickness.

For the common type of insert with a flat outer end face, and where the face of the panel is flat, the bridge 25 of the installation device is flat as shown in FIGS. 1–5. On the other hand, where the insert is to be installed in a curved panel or one having a surface that is not flat, the bridge 125 of an attachment device A1 can be curved or of channel form or otherwise bent as shown in FIG. 6 to conform to the surface contour of the panel, but if the insert that is to be installed in such a panel has a flat end face, the central portion of the bridge 125 will be flat as shown.

Where an insert B2 with a non-apertured head 217 is installed by the method of first injecting a measured quantity of potting compound into the panel hole, the attachment bridge 225 and its coating 228, of installation device A2 can be of plain disc form without apertures, as shown in FIGS. 7 and 8.

Although the circular shape is preferred in order to provide maximum support extending uniformly around the circumference of the insert head, the invention contemplates the possibility of utilizing other shapes such as the rectangular, insert body 325 as shown in FIG. 9, which can consist simply of a measured strip of material having a correspondingly rectangular adhesive coating 328 on its underface as shown in FIG. 9. The tab 327 can be correspondingly rectangular, square, triangular, hexagonal, octagonal, oval or of any other shape suitable for the tab form selected.

My improved method of installing an insert is rapid and effective and substantially foolproof. The covering 29 is stripped off the face of adhesive coating 28 and the insert body is then positioned over the head 17 of the insert with the appropriate pair of apertures 35, 36, 37 or 38 lined up with the apertures 18 of the insert head. If the workman is unable to do this simply by eye-sighting, he can insert a pointed locating rod or fork through the pair of apertures in the attachment device and thence into the apertures 18 of the insert head, thus positively locating the attachment device in the proper position over the head. When the device is properly located, its adhesive coating 28 is pressed firmly against the end face of the insert head 17 so as to attach the device to the insert as shown in FIG. 4. The attachment device can then be used as a holder to project and fit the insert into the hole 13, and as the insert reaches the proper depth in the hole, the adhesive coating 28 will establish contact with the panel skin 10 and the projecting marginal portion 25 of the device is then pressed firmly against the skin 10. Thus the insert is properly positioned with its outer face exactly flush to the outer surface of the skin 10 and with the insert axis normal to said surface.

The injection gun 20 is then applied to insert its nozzle 19 through an aperture in the attachment device A and into a registering aperture 18 of the insert head 17, and the gun can then be immediately operated to inject the potting compound 21 into the hole 13 until it appears in the other aperture 18, thus indicating the filling of the hole. During such injection, it is possible to press the nozzle end of the gun firmly against the attachment device A with the thickness of the attachment device interposed between the gun and the skin sheet 10, without tending to depress the attachment device below its normal flat plane.

As soon as the hole is filled with potting compound, the gun is removed and the operator proceeds immediately to the installation of another insert, leaving the insert B supported by the attachment device A until the potting compound 21 has hardened around the insert. Subsequently, the operator removes the attachment device A by simply grasping the tab 27 and stripping the device A away from the assembly of panel and insert. Any adhesive that may remain adhering to the outer face of the panel can subsequently be readily removed by wiping the surface with a cloth impregnated with a solvent for the adhesive.

I claim:

1. A method of installing a fastener insert having a head, into a hole in a sandwich panel with the insert head filling the outer end of said hole and flush with the outer face of the panel, said method including the following steps: utilizing a plate-like bridge having an area larger than the outer end face of said head and having an adhesive coating on its under face; adhesively attaching said bridge to said head by adhering a central portion of said adhesive coating to said outer end face with portions of the bridge and said adhesive coating projecting beyond the periphery of said head; inserting said insert into said panel hole with said projecting portions bridging across said outer end of the hole; adhesively attaching said projecting portions of the bridge to said panel by adhering the adhesive coating of said projecting portions to the outer surface of said panel, with said outer end surface of the insert flush with the outer face of the panel and with the axis of the insert normal to said outer panel surface; injecting an uncured hardenable potting compound into said hole past said bridge; and utilizing said bridge to hold said insert in place in said hole during injection and hardening of said compound.

2. An insert installation method as defined in claim 1, including the further step of stripping the device away from the panel and insert assembly after said insert is secured as aforesaid.

3. An insert installation method as defined in claim 2, for use in installing an insert having its said head provided with potting compound injection apertures; said method utilizing a bridge having apertures corresponding to said insert head apertures, and including the additional steps of registering said bridge apertures with said insert head apertures during attachment of said bridge to said insert head; and injecting said uncured potting compound into said hole through one registered pair of said apertures while air displaced from the hole by the compound is bled from the other aperture.

4. A method of installing a fastener insert having a head into a hole in a sandwich panel, including the following steps: inserting into said hole a body of uncured potting compound; utlizing as a holder a bridge of plate form having an adhesive coating on one face thereof; adhering a central area of said coating to the outer end face of said insert head with portions of said bridge projecting beyond the periphery of said head and with corresponding portions of said adhesive coating exposed on said projecting portions; inserting said fastener insert into said hole so as to cause said potting compound to fill the hole around the insert; adhesively attaching said projecting portions of the bridge to the outer face of said panel adjacent said hole by adhering said exposed portions of the adhesive coating to said outer panel face; and utilizing said bridge to maintain said insert supported in said hole with said outer end face flush with said outer panel face and with its axis normal to said outer panel face, during setting of said potting compound.

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ROBERT F. WHITE, *Primary Examiner.*

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Sept. 6, 1966 F. W. ROHE ET AL 3,271,498

METHOD OF INSTALLATION OF MOLDABLE INSERT IN SANDWICH PANEL

Filed Jan. 27, 1964

Fig. 1.

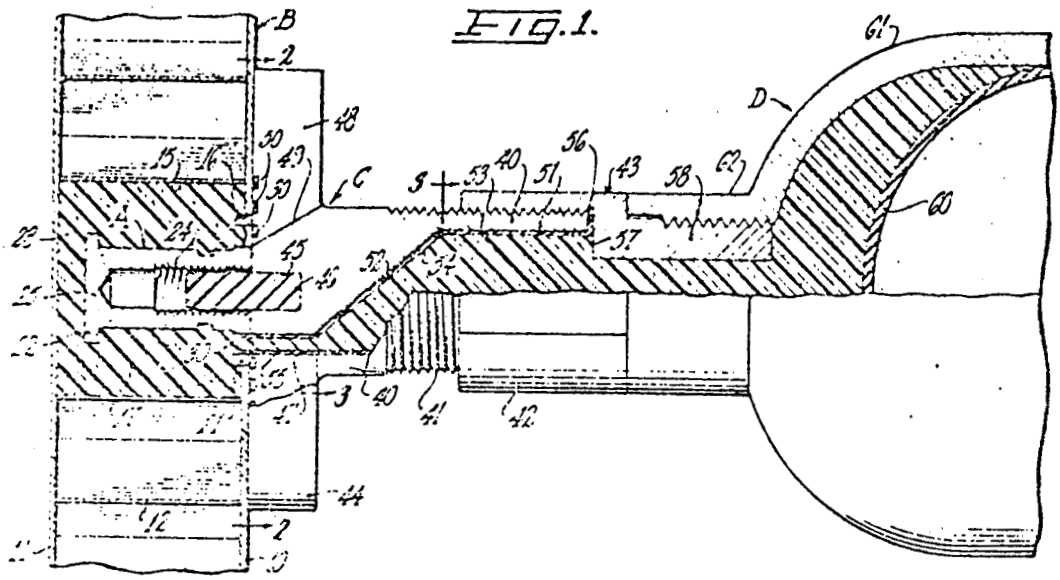


Fig. 2.

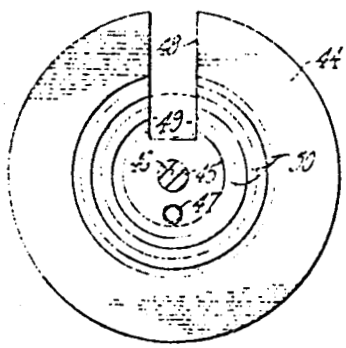


Fig. 3.

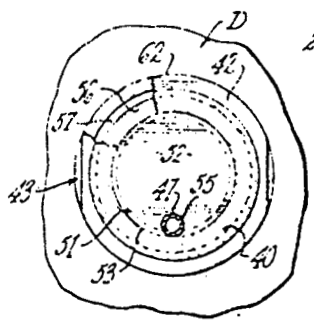


Fig. 4.

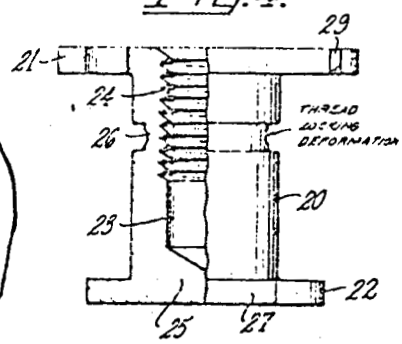


Fig. 5.

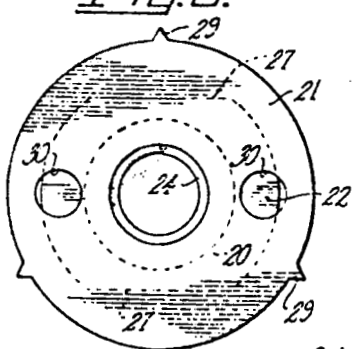


Fig. 6.

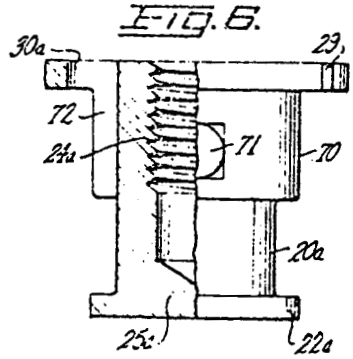


Fig. 7.

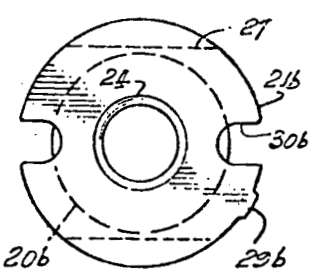
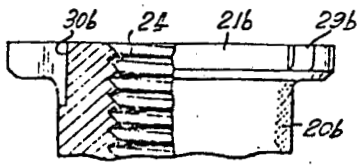


Fig. 8.



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weight, fragile core 12 of the panel. The core 12 may be fabricated of thin metal foil, of impregnated paper, or other equivalent material. The skin sheets 10 and 11 may be sheet metal (e.g. thin aluminum sheet) or may be of hard plastic or hard fibre (resin-impregnated paper) suitably bonded to the edges of the core cells by a suitable cement or other equivalent material.

In general, the invention provides for the preliminary insertion of the insert A into a hole bored through the skin sheet 10 and substantially through the core 12, resulting in a cavity 15 in the core which includes an annular series of pockets surrounding a bored cylindrical central area. Where the bored hole passes through the skin sheet 10, a circular aperture 16 is provided, the peripheral pockets of cavity 15 projecting radially beyond the aperture 16.

The invention provides, in the insert A, a circular disc head of slightly smaller diameter than the aperture 16, receivable therein with a sufficiently close fit to function as a stopper substantially closing the aperture, and provided with means for temporarily securing the same to the margin of aperture 16 pending the injection of potting compound 17 to fill the cavity 15.

The nozzle C may be used as the tool for pressing the insert into place in the panel hole, having means for mounting the insert thereon in coaxial relation thereto and having means for locating against the outer surface of skin sheet 10 to position the head of the insert in accurately flush relationship to the skin sheet when the head has been pressed into place in aperture 16 although a separate installation tool can be employed for this step. After the insert has been pressed into position, the nozzle C functions to inject the potting compound 17 through the insert head into the cavity 15, and when the cavity is filled, the nozzle can be withdrawn, leaving the insert self-supported in the aperture 16 during the period required for curing of the potting compound 17. The nozzle C has a self-cleaning feature which will be described hereinafter.

The insert A, in a preferred form (FIGS. 4 and 5) comprises a tubular body 20, which may be cylindrical as shown, a mounting head 21 in the form of an integral flat circular radial flange on one end of body 20, and an anchor head 22 of smaller radius, in the form of an integral radial flange on the other end of body 20. The body 20 has a bore 23 which preferably is internally threaded at 24 for at least a portion of its length, and may have a closed bottom defined by an integral central portion 25 of anchor head 22.

With the internal thread 24, the insert body 20 functions as a nut to receive a screw inserted through the mounting head 21, and the body 20 is provided with a suitable thread lock which, in the particular form of the invention shown in FIG. 4, is embodied in a radially inward deformation (so labelled in FIG. 4) of a reduced thickness neck 26 in an intermediate portion of body 20, the neck being defined by an external annular groove in the body 20.

Preferably, the anchor head 22 has a non-circular periphery which may have varying configurations as more specifically described hereinafter, but which, in the particular form shown in FIG. 4, is provided with one or more flat faces 27 interrupting an otherwise circular periphery. Thus, the head 22 may comprise a pair of diametrically opposed flats 27 and a pair of intervening circular segments of periphery. The flats 27 interlock with the potting compound 17 to lock the insert in the panel against rotation in response to torque forces imposed thereon during the insertion and removal of a screw. In the installed assembly shown in FIG. 1, the head 22 is spaced from the skin sheet 11 by a space which is filled by a layer 28 of potting compound, providing an adhesive connection between the head 22 and the skin sheet 11.

An important novel step in the present process is to temporarily secure the insert in the sandwich cavity 15 with the insert head disposed substantially in the plane of the bored skin sheet 10, and to thus support the insert in a proper position not only during the step of injecting a potting compound into the cavity, but also during the subsequent stage of setting of the compound to a solid condition in which it anchors the insert in place, permitting the injection gun to be immediately withdrawn after filling the cavity 15 and thus providing a very important improvement over the previous method of using the gun to hold the insert in position during the setting of the potting compound. In the embodiment of the method herein illustrated, there is utilized a temporary holding means integral with the insert. The immediate removal of the gun after filling the cavity 15 with potting compound, leaving the insert supported in proper position by the temporary attachment to the panel, is another important step in our method.

Attachment of mounting head 21 to skin sheet 10 is provided for by one or more small radial anchor teeth 29 on the otherwise circular periphery of the head. Teeth 29 have a height somewhat greater than the clearance space between the periphery of head 21 and the skin sheet aperture 16, so as to intersect and embed themselves in the aperture margin when the insert head is forced into the aperture. However, they are of sufficiently small volume so as to pierce the aperture margin without causing the skin sheet to become warped or depressed below its own plane. For example, where the insert head 21 has a diameter of one half inch and a clearance of .005 inch between its periphery and the margin of aperture 16, the mounting teeth 29 may have a radial height approximately in the range of .007 inch to .02 inch. The anchor teeth 29 are preferably of chisel-edge form, with an isosceles-triangular end contour as seen in FIG. 5, so as to enter the aperture 16 with a lancing action in the margin of the aperture, which can be effected by applying relatively light end pressure to the head as it is pushed into the aperture. In the head 21 are a pair of ports 30, one of which is utilized as an inlet for injection of the potting compound 17 through the head 16, and the other of which functions as a vent for the escape of air from the cavity 15 as it is displaced by the potting compound entering the cavity, and also functions as an inspection port.

Nozzle C comprises a cylindrical barrel 40 having at one end a male thread 41 for coupling into an internally threaded socket 42 of an adapter fitting 43; and having at its other end an integral anvil 44 in the form of a thick circular coaxial disc which projects as a radial flange from the barrel 40. Insert head 21 is pressed firmly into full contact with the face of anvil 44 by the resistance of skin sheet 10 to the penetration of anchor teeth 29. The barrel and anvil may be fabricated as a casting of aluminum or other suitable material. In the center of anvil 44 is a cylindrical axial bore 45 in which is mounted, by a press-fit, a pilot 46 of a tough, wear-resistant, slightly compressible material such as nylon or polyethylene, having a diameter such as to be received in the internally threaded section 24 of insert A with a close fit such that the insert will engage the pilot with a light (not tight) frictional engagement and be thereby held with its head 21 snugly seated against the front face of anvil 44 when the insert has been pressed onto the pilot.

In the anvil 44, at one side of its center, is an axially extending passage 47. In the opposite side of the anvil is a window 48 in the form of a radial slot having a width at least equal to the diameter of a port 30 which is adapted to be registered with the bottom area of the window 48. The bottom wall 49 of the slot is inclined forwardly toward the axis of the nozzle from the periphery of the barrel 40 where it joins the back face of anvil 44 to a radius at least as close to the axis as the

inner extremity of port 30. Thus it becomes possible for the operator to sight through the window 48 during the step of injecting the potting compound into cavity 15, keeping the vent port 30 in full view until the potting compound has filled the cavity 15 and commences to exude through the vent port 30 which will indicate to him that the injection of potting compound is to be arrested.

Sighting through the vent port 30 in order to determine when the cavity 15 is sufficiently filled, is another important step in our method.

Utilizing the vent port 30 for the venting of gases from the cavity 15, is another important step of our method.

In the forward face of anvil 44 are a plurality of shallow concentric annular grooves 50 adapted to receive any excess potting compound which may inadvertently be extruded from the vent aperture 30, avoiding the possibility of the compound creeping between the face of the anvil and the insert head 21 and establishing an adhesive bond which might dislodge the insert as the gun is pulled away from the panel.

The barrel 40 defines, within itself, a chamber for the transfer of potting compound from gun D to the panel cavity 15, said chamber including a cylindrical bore 51, a funnel area defined by a wall 52 of asymmetrical conical contour converging uniformly in straight lines from the cross sectional contour of bore 51 to the small cross sectional contour of passage 47. Passage 47 is positioned with its outer side aligned with the cylindrical wall of bore 51. The barrel chamber, and the passage 47, are lined by a thin-walled, disposable plastic liner including a cylindrical portion 53, a conical portion 54 fitted to the funnel wall 52, and a tubular nozzle tip 55 fitted snugly within the passage 47. The rear end of cylindrical body 53 is open and is provided with a radially outwardly projecting flange 56 which is clamped between the rear end of barrel 41 and an off-set radial shoulder wall 57 of adapter fitting 43. Fitting 43 includes an externally threaded neck 58 joined to the socket 42 by the offset portion which defines radial shoulder wall 57.

The nozzle 55 is of a length such as to project beyond the forward face of anvil 44 and into the inlet port 30 of insert head 21 as shown in FIG. 1. The liner 53–55 is preferably of a medium-soft plastic material such as polyethylene, such as to conform readily to the wall contours of barrel 41 to receive support therefrom, and such that the tip 55 can be snugly fitted in the inlet port 30 so as to be substantially sealed against backflow of the potting compound through the inlet port 30.

Gun D may be of any suitable known type having a piston 60 for applying pressure to a body of potting compound contained within the housing 61, and delivered under pressure through an internally threaded collar 62 into the adapter neck 58 threaded into the collar 62.

When a period of use of the gun is terminated, the nozzle unit C is unscrewed from the collar 62, the adapter 43 is removed from the barrel 40, thus exposing the flange 56, the latter is pried loose from the end of barrel 40 and is grasped to withdraw the liner 53–55 from the barrel 40, and the liner with its residual potting compound therein is discarded as waste material. This leaves the internal surfaces of the barrel 40 and passage 47 clean, without any potting compound adhering thereto. The two sections of the nozzle assembly may then be further cleaned in a suitable solvent to remove any vestiges of the potting compound, and so as to be in proper condition for the next period of use. The gun is, of course, cleaned in accordance with conventional practice.

Our improved method will now be clearly apparent from a brief review of the installation procedures hereinbefore referred to. In preparing a panel for a series of inserts located on predetermined centers, such centers are marked on the panel, or located by a suitable jig, and a series of holes are then bored in the panel, using a suitable end-cutting boring tool, of the proper diameter to provide bores just slightly larger in diameter than the heads of the inserts that are to be installed.

The gun is then loaded with a prepared liquid mixture of resin and catalyst, the nozzle assembly C is fitted with a fresh liner, its two sections are coupled together, and it is then attached to the gun. In succession, a series of inserts A are attached to the forward face of anvil 44 by pushing the pilot 45 into the threaded bore of each insert and pressing the end face of the insert head 21 into full seating engagement with the face of anvil 44, after first rotating the insert until one of its ports 30 registers with the anvil window 48 and its other port 30 registers with and receives the projecting end portion of nozzle tip 55. Using the gun as a handle, the insert is then projected through a selected aperture 16 and its head 21 fitted in the aperture. End pressure is then applied to force the anchor teeth 29 into the aperture margin, until the forward face of anvil 44 is in full face-to-face contact with the skin sheet 10. This will automatically result in the proper positioning of the insert in coaxial relation to the cavity 15 and with its head 21 in flush relation to skin sheet 10. The gun is then operated to express the potting compound through the nozzle unit C and its tip 55, thence through the inlet port 30 of the insert and into the cavity 15, gradually filling the same. Entrapped air in the cavity will be vented through the vent port 30 and the window 48. During the filling operation, the operator will inspect the vent port 30 through the window 48 until the potting compound appears in the vent port 30, whereupon he will discontinue the injection operation and will promptly pull the gun away from the panel, withdrawing the pilot 46 from the bore of the insert and withdrawing the nozzle 55 from the inlet port 30. The attachment of the head 21 to the skin sheet 10 by the embedding of anchor teeth 29 in the margin of aperture 16 suffices to hold the insert securely in its coaxial, flush position in the panel, without being dislodged by the withdrawal of the parts 46 and 55; and will continue to support the insert in its coaxial, flush position until the potting compound 17 has set sufficiently to provide adequate support. As the potting compound hardens around the insert, it provides a secure interlocking engagement with the insert and with the inner face of the skin sheet 10 at the ends of the radially projecting pocket portions of cavity 15, such as to securely resist displacement of the insert from its fixed position in the panel, under the torque load of screwing a fastener screw into the insert, or under axial load transmitted through the screw to the insert from a part that is attached to the panel by the insert.

The converging funnel portion 54 of the nozzle liner is such as to eliminate any corner pockets in which potting compound could escape from the flowing stream of compound passing through the nozzle and harden so as to eventually obstruct the nozzle tip 55. It provides a converging approach from the large cross sectional area of cylindrical portion 53 to the relatively small cross sectional area of nozzle tip 55, wherein all areas are subjected to the scavenging flow of the potting compound through the nozzle and cannot encourage the build-up of a deposit of hardened compound.

FIG. 6 illustrates a desirable modification of the insert shown in FIGS. 4 and 5, wherein the tubular insert body 20*a* has an enlarged shoulder portion 70 having a cylindrical radial bore in which is mounted a locking pellet 71 of a tough, slightly yieldable plastic material such as nylon, having an inner end projecting for interference engagement with the threads of the screw that is threaded into bore 24*a*. The ports 30*a* in head 21 have extended portions 72 in the form of channels in opposite sides of shoulder 70, and such channels will be filled by potting material, which, when hardened, will form ribs or keys interlocking with the shoulder 70 to resist torque loads to which the insert may be subjected. In this case, the anchor head 22*a* may be of plain circular flange form.

One of the important advantages of our improved insert and installation is the ease with which they can be utilized in either vertical or overhead panels.

It should be understood that the invention, as it relates to the insert, is not restricted to any specific configuration in the means on the insert body for interlocking engagement with the body of potting material. Any projection, recess or surface of non-circular cross-section which will establish a shear relationship to the contacting potting material, sufficient to provide adequate torque load holding action, may be employed.

The number of anchor teeth 29 may vary from a large number of closely spaced teeth of very slight radial projection down to a single tooth adapted to be embedded in the aperture rim at one side thereof and to wedge the opposite side of the insert head 21 into tight frictional or interference engagement with the opposite side of the aperture rim. FIGS. 7 and 8 illustrate the use of a single anchor projection. Also, as illustrated in FIGS. 6, 7 and 8, in lieu of a tooth with a sharp peripheral edge for lancing action, the tooth 29*b*, as illustrated in FIGS. 7 and 8, can be relatively wide circumferentially and of only slight radial height, and adapted for embedding itself in the aperture rim by a wedging action. To this end, the projection 29*b* can be of wedge or ramp shape, having substantially no height at the inner margin of the head 21*b* and gradually increasing in radial height toward the outer margin of the head 21*b*. Also, its ramp surface may be rounded in an axial direction as indicated in FIG. 8, so as to provide a crown surface substantially parallel to the cylindrical peripheral surface of head 21*b* in the area near the outer margin of the latter, thereby decreasing the likelihood of the wedge shaped tooth becoming loose from its gripping engagement with the aperture margin.

FIGS. 7 and 8 also illustrate another possible modification of the insert construction, utilized in inserts of a smaller range of diameters. In this range, the peripheral diameter of the outer head of the insert may be too small to accommodate the closed apertures of FIG. 5. Accordingly, for this range of inserts, the apertures 30*b*, open at the periphery of the head 21*b*, are utilized. The method of installing the insert of FIGS. 7 and 8, remains however essentially the same as that described above.

The body 20*b* of the insert of FIGS. 7 and 8 is provided with a knurled external surface as indicated in FIG. 8, for increasing the anchorage against rotation in the anchoring body of potting compound, thus assisting the flatted sides 27 of the inner head and the anti-rotation embedment of the projection 29*b* in the margin of the aperture.

We claim:

1. In the art of installing a fastener insert in a sandwich panel embodying a fragile, low density core sandwiched between spaced solid skin sheets, the method comprising the following steps: providing a hole in said panel beginning with an aperture in one of said skin sheets and extending into said core; utilizing an insert including a mounting head proportioned to fit snugly within said aperture, and having a pair of spaced ports therein, and a hollow body of smaller diameter than said head, extending axially therefrom and receivable in said hole within said core; projecting said insert into said hole and moving said head into closing relation to said aperture; providing a temporary supporting attachment between said head and skin sheet; subsequently injecting potting material through one of said ports into said hole by applying the nozzle of an injection gun to one of said ports; venting said hole through the other port as the potting material fills the hole and displaces air therefrom; visually inspecting said venting port to avoid injection of excess potting material into the hole; arresting the injection operation when sufficient potting material has been injected as thus determined; withdrawing said gun from the insert before said potting material has set and utilizing said temporary supporting attachment to hold said insert in position while said potting material hardens around said insert.

2. The method defined in claim 1, wherein an injection gun attachment having a pilot insertible in said insert and a nozzle tip insertible simultaneously in said port, and an anvil for positioning engagement with said skin sheet, is utilized as a handling implement for inserting said insert into said hole, for positioning the insert head in flush relation to said skin sheet, and for injecting the potting material through said port while holding the insert in said positioned relation; and including the step of removing the gun as soon as the hole is filled with potting material.

3. The method defined in claim 2, including the further step of utilizing a disposable liner within said gun attachment to shield the internal walls thereof from contact with said potting material, and providing on said liner the aforesaid nozzle tip which is coupled within said port to deliver the potting material beyond the forward end of the attachment without contact therewith, and removing and disposing of said liner when a period of use of the gun is completed.

4. The method defined in claim 1, including the inspecting of said venting port during the injection of potting material, and arresting the injection operation when the potting material commences to exude from said venting port.

5. In the art of installing a fastener insert in a sandwich panel embodying a fragile, low density core sandwiched between spaced solid skin sheets, the method comprising the followjng steps: providing a hole in said panel beginning with a circular aperture in one of said skin sheets and extending into said core; utilizing an insert including a circular mounting head of a diameter to fit snugly within said aperture and having a port therein, and a hollow body of smaller diameter than said head, extending axially therefrom and receivable in said hole within said core; providing on the periphery of said head, at least one integral radial tooth of a radial height to slightly intersect the margin of said aperture when said head is received therein; projecting said insert into said hole; moving said head into coaxial adjacency to said aperture; applying end pressure to press said head into said aperture so as to embed said tooth into the margin of said aperture, thereby establishing a temporary supporting attachment between said head and skin sheet; subsequently injecting potting material through said port into said hole; detaching the gun from the insert as soon as the injection step is completed; and utilizing said temporary supporting attachment to hold said insert in position while said potting material hardens around said insert.

6. The method defined in claim 1, wherein said temporary supporting attachment is effected by establishing an interference fit between the periphery of said insert head and the edge of said skin sheet aperture.

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L. S. SQUIRES, *Assistant Examiner.*

Nov. 1, 1966 F. W. ROHE ETAL 3,282,015

MOLDABLE INSERT FASTENER WITH DUAL POTTING PORTS IN HEAD

Filed April 20, 1962 2 Sheets-Sheet 1

Fig. 1.

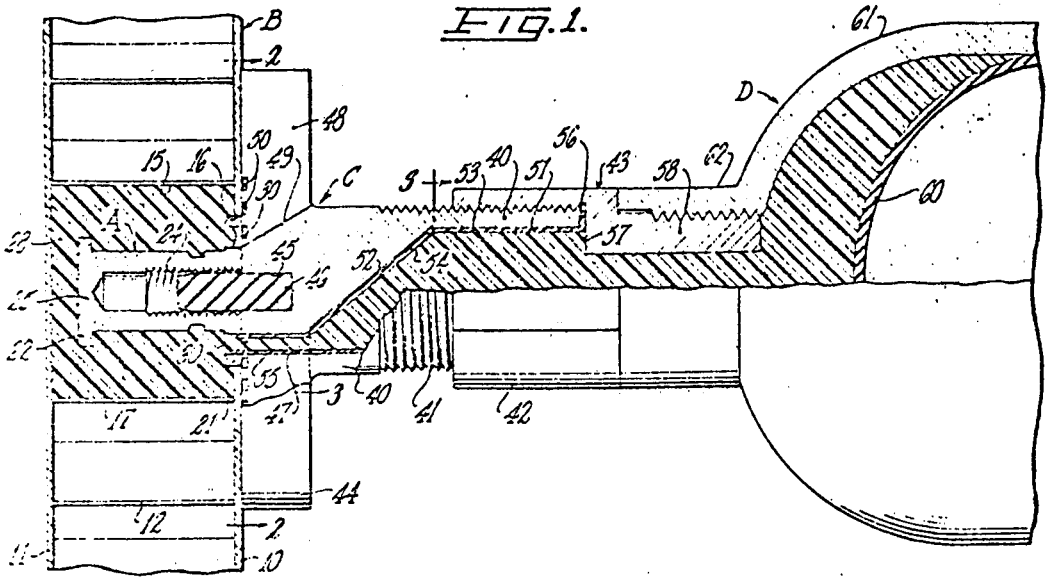


Fig. 2.

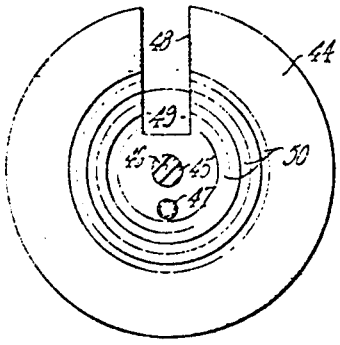


Fig. 3.

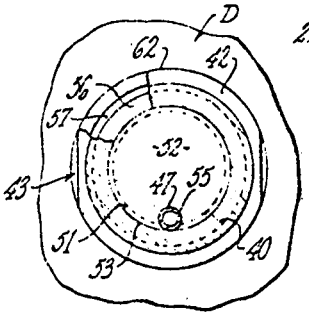


Fig. 4.

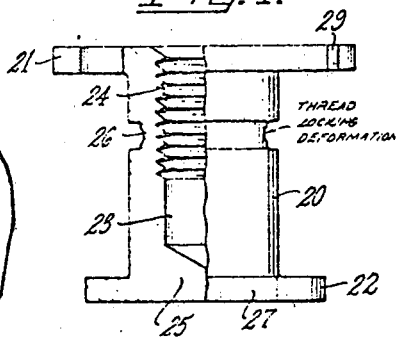


Fig. 5.

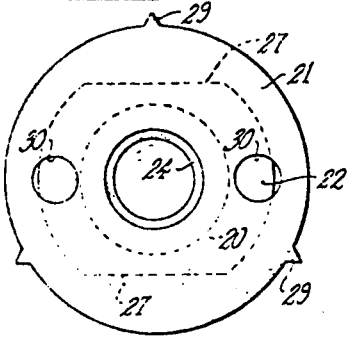
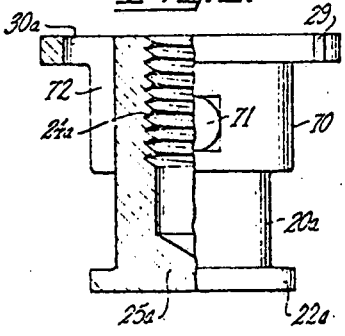


Fig. 6.



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MOLDABLE INSERT FASTENER WITH DUAL POTTING PORTS IN HEAD

Filed April 20, 1962 2 Sheets-Sheet 2

Fig. 7.

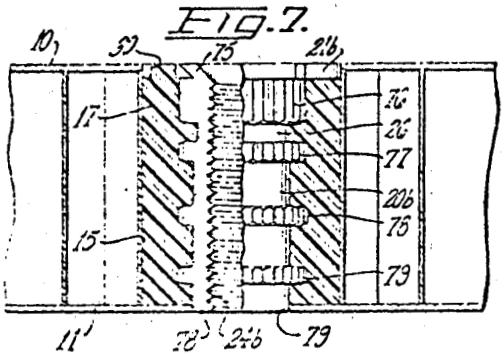


Fig. 8.

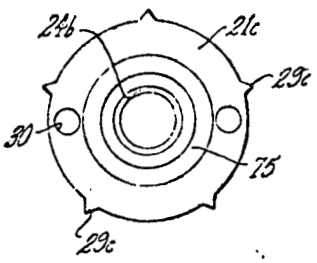


Fig. 9.

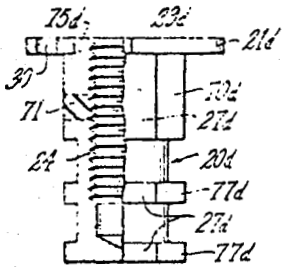


Fig. 10.

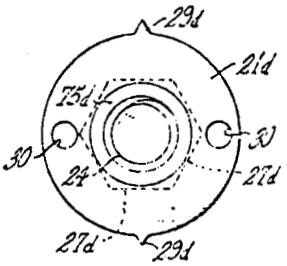


Fig. 11.

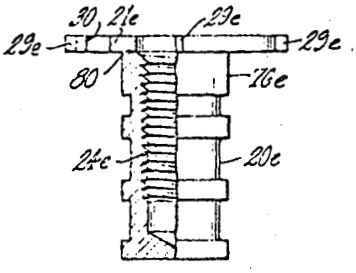


Fig. 12.

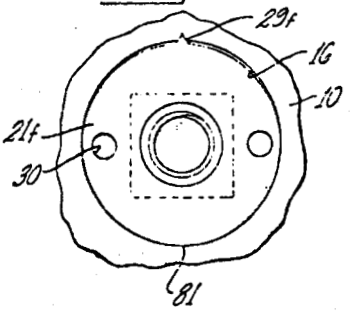


Fig. 15.

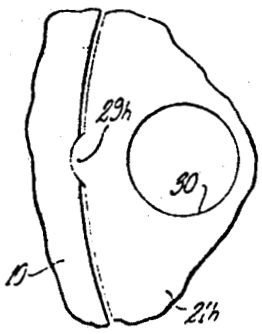


Fig. 13.

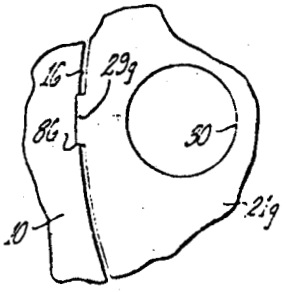
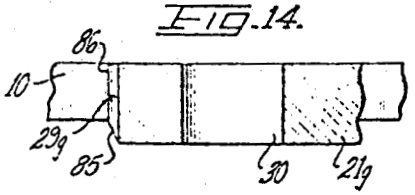


Fig. 14.



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Exh. 1

United States Patent Office

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3,282,015

MOLDABLE INSERT FASTENER WITH DUAL POTTING PORTS IN HEAD

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Filed Apr. 20, 1962, Ser. No. 189,194
1 Claim. (Cl. 52—704)

This invention relates to structural fasteners for lightweight, fragile-core sandwich panels, of the type known in the trade as "molded insert fasteners," the general object of the invention being to provide an improved insert having a head in the form of a flat disc and a tubular body for reception of a fastener part such as a screw, adapted to be anchored by means of a surrounding molded body of solidified resin potting material, within a hole bored through a skin sheet on one side of the panel and through the core, terminating adjacent the opposite skin sheet.

In an effort to improve the earlier method of installing the fl. h-type insert by reducing the number of steps required therein, the art has more recently provided an improvement therein, involving the use of an insert with a port in its flush head, and the injection of the liquid resin from a gun through such port while the insert is held, by suitable attachment to the gun, in a position centered in the hole in the panel and with its head received in flush relation in the skin sheet aperture.

A further object of the invention is to provide an improved insert having resin-injection means through which the panel hole can be completely filled with the liquid resin without leaving air pockets therein and can be accurately filled without extruding resin past the insert head, whereby the necessity for cleaning away extruded excess resin is eliminated.

Other objects and advantages will become apparent in the ensuing specifications and appended drawing in which:

FIG. 1 is a fragmentary sectional view of a sandwich panel: an insert in the process of being installed therein; our improved gun nozzle utilized in such installation; and its connection to an extrusion gun;

FIG. 2 is an end view of the face of the gun nozzle on line 2—2 of FIG. 1;

FIG. 3 is a sectional view of the gun nozzle taken on line 3—3 of FIG. 1, viewing the front end of the liner in end elevation;

FIG. 4 is a side elevational view, partially in axial section, of a preferred form of our improved insert;

FIG. 5 is a head end view of the same;

FIG. 6 is a side elevational view, partially in section, of a modified form of the insert;

FIG. 7 is a sectional view of a fragment of a sandwich panel embodying a modified form of our improved insert;

FIG. 8 is an end view of a modified form of the insert;

FIG. 9 is a side elevational view, partially in axial section, showing another modified form of the insert;

FIG. 10 is an end view of the same;

FIG. 11 is a side elevational view, partially in axial section, showing a further modified form of the insert;

FIG. 12 is an end view of another modified form of the insert, as installed in a panel;

FIG. 13 is a fragmentary end view of another modified form of the insert as installed in a panel, shown on a greatly magnified scale;

FIG. 14 is a fragmentary axial sectional view of the same; and

FIG. 15 is a fragmentary end view of another modified form of the insert as installed in a panel.

General description

Referring now to FIG. 1 of the drawings, we have shown therein, as an illustrative example, one of our improved inserts, indicated generally at A, in the process of being installed in a sandwich panel B by an injection nozzle C attached to a gun D. The details of the gun do not form any part of the present invention and accordingly, only enough of the gun to illustrate the attachment of the nozzle C thereto, is shown. The sandwich panel B, shown by way of illustration of the general type of panel to which the invention may be applied, is one wherein spaced skin sheets 10 and 11 are united to the edges of a series of honeycomb cells constituting the lightweight, fragile core 12 of the panel. The core 12 may be fabricated of thin metal foil, of impregnated paper, or other equivalent material. The skin sheets 10 and 11 may be sheet metal (e.g. thin aluminum sheet) or may be hard plastic or hard fibre (resin-impregnated paper, suitably bonded to the edges of the core cells by a suitable cement or other equivalent material.

In general, the invention provides for the preliminary insertion of the insert A into a hole bored through the skin sheet 10 and substantially through the core 12, resulting in a cavity 15 in the core which includes an annular series of pockets surrounding a bored cylindrical central area. Where the bored hole passes through the skin sheet 10, a circular aperture 16 is provided, the peripheral pockets of cavity 15 projecting radially beyond the aperture 16.

The invention provides, in the insert A, a circular disc head of slightly smaller diameter than the aperture 16, receivable therein with a sufficiently close fit to function as a stopper closing the aperture, and provided with means for temporarily securing the same to the margin of aperture 16 pending the injection of potting compound 17 to fill the cavity 15.

The nozzle C may be used as the tool for pressing the insert into place in the panel hole, having means for mounting the insert thereon in coaxial relation thereto and having means for locating against the outer surface of skin sheet 10 to position the head of the insert in accurately flush relationship to the skin sheet when the head has been pressed into place in aperture 16, although a separate installation tool can be employed for this step. After the insert has been pressed into position, the nozzle C functions to inject the potting compound 17 through the insert head into the cavity 15, and when the cavity is filled, the nozzle can be withdrawn, leaving the insert self-supported in the aperture 16 during the period required for curing of the potting compound 17. The nozzle C has a self-cleaning feature which will be described hereinafter.

Detailed description

The insert A, in a preferred form (FIGS. 4 and 5) comprises a tubular body 20, which may be cylindrical as shown, a mounting head 21 in the form of an integral flat circular radial flange on one end of body 20, and an anchor head 22 of smaller radius, in the form of an integral radial flange on the other end of body 20. The body 20 has a bore 23 which preferably is internally threaded at 24 for a least a portion of its length, and may have a closed bottom defined by an integral central portion 25 of anchor head 22.

With the internal thread 24, the insert body 20 functions as a nut to receive a screw inserted through the mounting head 21, and the body 20 is provided with a suitable thread lock which, in the particular form of the

invention shown in FIG. 4, is embodied in a radially inward deformation (so labelled in FIG. 4) of a reduced thickness neck 26 in an intermediate portion of body 20, the neck being defined by an external annular groove in the body 20.

Preferably, the anchor head 22 has a non-circular periphery which may have varying configurations as more specifically described hereinafter, but which, in the particular form shown in FIG. 4, is provided with one or more flat faces 27 interrupting an otherwise circular periphery. Thus, the head 22 may comprise a pair of diametrically opposed flats 27 and a pair of intervening circular segments of periphery. The flats 27 interlock with the potting compound 17 to lock the insert in the panel against rotation in response to torque forces imposed thereon during the insertion and removal of a screw. In the installed assembly shown in FIG. 1, the head 22 is spaced from the skin sheet 11 by a space which is filled by a layer 28 of potting compound, providing an adhesive connection between the head 22 and the skin sheet 11.

Attachment of head mounting 21 to skin sheet 10 is provided for by one or more small radial anchor teeth 29 on the otherwise circular periphery of the head. Teeth 29 have a height somewhat greater than the clearance space between the periphery of head 21 and the skin sheet aperture 16, so as to intersect and embed themselves in the aperture margin when the insert head is forced into the aperture. However, they are of sufficiently small volume so as to pierce the aperture margin without causing the skin sheet to become warped or depressed below its own plane. For example, where the insert head 21 has a diameter of one half-inch and a clearance of .005 inch between its periphery and the margin of aperture 16, the mounting teeth 29 may have a radial height approximately in the range of .007 inch to .02 inch.

The anchor teeth 29 are preferably of chisel-edge form, with an isosceles-triangular end contour as seen in FIG. 5, so as to enter the aperture 16 with a lancing action in the margin of the aperture, which can be effected by applying relatively light end pressure to the head as it is pushed into the aperture.

In the head 21 are a pair of ports 30, one of which is utilized as an inlet for injection of the potting compound 17 through the head 16, and the other of which functions as a vent for the escape of air from the cavity 15 as it is displaced by the potting compound entering the cavity, and also functions as an inspection port.

Nozzle C comprises a cylindrical barrel 40 having at one end a male thread 41 for coupling into an internally threaded socket 42 of an adapter fitting 43; and having at its other end an integral anvil 44 in the form of a thick circular coaxial disc which projects as a radial flange from the barrel 40. The barrel and anvil may be fabricated as a casting of aluminum or other suitable material. In the center of anvil 44 is a cylindrical axial bore 45 in which is mounted, by a press-fit, a pilot 46 of a tough, wear-resistant, slightly compressible material such as nylon or polyethylene, having a diameter such as to be received in the internally threaded section 24 of insert A with a close fit such that the insert will engage the pilot with a light (not tight) frictional engagement and be thereby held with its head 21 snugly seated against the front face of anvil 44 when the insert has been pressed onto the pilot.

In the anvil 44, at one side of its center, is an axially extending passage 47. In the opposite side of the anvil is a window 48 in the form of a radial slot having a width at least equal to the diameter of a port 30 which is adapted to be registered with the bottom area of the window 48. The bottom wall 49 of the slot is inclined forwardly toward the axis of the nozzle from the periphery of the barrel 40 where it joins the back face of anvil 44 to a radius at least as close to the axis as the inner extremity of port 30. Thus it becomes possible for the operator to sight through the window 48 during the step of injecting the potting compound into cavity 15, keeping the vent port 30 in full view until the potting compound has filled the cavity 15 and commences to exude through the vent port 30, which will indicate to him that the injection of potting compound is to be arrested.

In the forward face of anvil 44 are a plurality of shallow concentric annular grooves 50 adapted to receive any excess potting compound which may inadvertently be extruded from the vent aperture 30, avoiding the possibility of the compound creeping between the face of the anvil and the insert head 21 and establishing an adhesive bond which might dislodge the insert as the gun is pulled away from the panel.

The barrel 40 defines, within itself, a chamber for the transfer of potting compound from gun D to the panel cavity 15, said chamber including a cylindrical bore 51, a funnel area defined by a wall 52 of asymmetrical conical contour, converging uniformly in straight lines from the cross sectional contour of bore 51 to the small cross sectional contour of passage 47. Passages 47 is positioned with its outer side aligned with the cylindrical wall of bore 51. The barrel chamber, and the passage 47, are lined by a thin-walled, disposable plastic linear including a cylindrical portion 53, a conical portion 54 fitted to the funnel wall 52, and a tubular nozzle tip 55 fitted snugly within the passage 47. The rear end of cylindrical body 53 is open and is provided with a radially outwardly projecting flange 56 which is clamped between the rear end of barrel 41 and an off-set radial shoulder wall 57 of adapter fitting 43. Fitting 43 includes an externally threaded neck 58 joined to the socket 42 by the offset portion which defines radial shoulder wall 57.

The nozzle 55 is of length such as to project beyond the forward face of anvil 44 and into the inlet port 30 of insert head 21 as shown in FIG. 1. The liner 53–55 is preferably of a medium soft plastic material such as polyethylene, such as to conform readily to the wall contours of barrel 41 to receive support therefrom, and such that the tip 55 can be snugly fitted in the inlet port 30 so as to be substantially sealed against back-flow of the potting compound through the inlet port 30.

Gun D may be of any suitable known type having a piston 60 for applying pressure to a body of potting compound contained within the housing 61, and delivered under pressure through an internally threaded collar 62 into the adapter neck 58 threaded into the collar 62.

When a period of use of the gun is terminated, the nozzle unit C is unscrewed from the collar 62, the adapter 43 is removed from the barrel 40, thus exposing the flange 56, the latter is pried loose from the end of barrel 40 and is grasped to withdraw the liner 53–55 from the barrel 40, and the liner with its residual potting compound therein is discarded as waste material. This leaves the internal surfaces of the barrel 40 and passage 47 clean, without any potting compound adhering thereto. The two sections of the nozzle assembly may then be further cleaned in a suitable solvent to remove any vestiges of the potting compound, and so as to be in proper condition for the next period of use. The gun is, of course, cleaned in accordance with conventional practice.

The method

Our improved method will now be clearly apparent from a brief review of the installation procedures hereinbefore referred to. In preparing a panel for a series of inserts located on predetermined centers, such centers are marked on the panel, or located by a suitable jig, and a series of holes are then bored in the panel, using a suitable end-cutting boring tool, of the proper diameter to provide bores just slightly larger in diameter than the heads of the inserts that are to be installed.

The gun is then loaded with a prepared liquid mixture of resin and catalyst, the nozzle assembly C is fitted with a fresh liner, its two sections are coupled together, and it is then attached to the gun. In succession, a series of

inserts A are attached to the forward face of anvil 44 by pushing the pilot 46 into the threaded bore of each insert and pressing the end face of the insert head 21 into full seating engagement with the face of anvil 44, after first rotating the insert until one of its ports 30 registers with the anvil window 48 and its other port 30 registers with and receives the projecting end portion of nozzle tip 55. Using the gun as a handle, the insert is then projected through a selected aperture 16 and its head 21 fitted in the aperture. End pressure is then applied to force the anchor teeth 29 into the aperture margin, until the forward face of anvil 44 is in full face-to-face contact with the skin sheet 10. This will automatically result in the proper positioning of the insert in coaxial relation to the cavity 15 and with its head 21 in flush relation to skin sheet 10. The gun is then operated to express the potting compound through the nozzle unit C and its tip 55, thence through the inlet port 30 of the insert and into the cavity 15, gradually filling the same. Entrapped air in the cavity will be vented through the vent port 30 and the window 48. During the filling operation, the operator will inspect the vent port 30 through the window 48 until the potting compound appears in the vent port 30, whereupon he will discontinue the injection operation and will promptly pull the gun away from the panel, withdrawing the pilot 46 from the bore of the insert and withdrawing the nozzle 55 from the inlet port 30. The attachment of the head 21 to the skin sheet 10 by the embedding of anchor teeth 29 in the margin of aperture 16 suffices to hold the insert securely in its coaxial, flush position in the panel, without being dislodged by the withdrawal of the parts 46 and 55; and will continue to support the insert in its coaxial, flush position until the potting compound 17 has set sufficiently to provide adequate support. As the potting compound hardens around the insert, it provides a secure interlocking engagement with the insert and with the inner face of the skin sheet 10 at the ends of the radially projecting pocket portions of cavity 15, such as to securely resist displacement of the insert from its fixed position in the panel, under the torque load of screwing a fastener screw into the insert, or under axial load transmitted through the screw to the insert from a part that is attached to the panel by the insert.

The converging funnel portion 54 of the nozzle liner is such as to eliminate any corner pockets in which potting compound could escape from the flowing stream of compound passing through the nozzle and harden so as to eventually obstruct the nozzle tip 55. It provides a converging approach from the large cross sectional area of cylindrical portion 53 to the relatively small cross sectional area of nozzle tip 55, wherein all areas are subjected to the scavenging flow of the potting compound through the nozzle and cannot encourage the build-up of a deposit of hardened compound.

Modified forms of insert

FIG. 6 illustrates a desirable modification of the insert shown in FIGS. 4 and 5, wherein the tubular insert body 20*a* has an enlarged shoulder portion 70 having a cylindrical radial bore in which is mounted a locking pellet 71 of a tough, slightly yieldable plastic material such as nylon, having an inner end projecting for interference engagement with the threads of the screw that is threaded into bore 24*a*. The ports 30*a* in head 21 have extended portions 72 in the form of channels in opposite sides of shoulder 70, and such channels will be filled by potting material, which, when hardened, will form ribs or keys interlocking with the shoulder 70 to resist torque loads to which the insert may be subjected. In this case, the anchor head 22*a* may be of plain circular flange form.

FIG. 7 discloses an insert fastener having a number of modified features, any one or more of which can be embodied in modifications in the fasteners described in the form of a washer having a countersunk central aperture in which a neck portion 75 of tubular body 20*b* is secured by swaging outwardly with a conical swaging tool. The body 20*b* may be a section of splined rod, turned down to leave a selected series of peripherally splined annular anchor heads 76, 77, 78 and 79 in the form of integral collars thereon, with the potting material 17 meshing with the splines of these collars to lock the insert against rotation, and filling the annular grooves between the collars to lock the insert against axial displacement. This particular configuration is especially adaptable for withstanding unusually high torque loads and end loads. FIG. 7 discloses a further modified feature embodying a through bore 24*b* in the tubular body 20*b*, and a projecting tail end 78 having a frusto-conical external surface with a slight taper adapted to be wedged in a circular aperture 79 in the skin sheet 11 and to seal therein so as to provide a closed bottom for cavity 15 and to retain the potting material 17 therein.

Between the splined collar portions 77, the tubular nut body 20*b* may have cylindrical external surfaces. Between the collar portions 76 and 77, it may embody a reduced thickness locking neck 26 as in FIG. 4. The collar portion 76 provides a shoulder against which the head 21*b* is securely mounted.

FIG. 8 illustrates the possibility of employing a larger number of the anchor teeth 29*c*, five being shown. When the number of teeth is thus increased, their radial height is preferably decreased so that the total volume of embedment of the teeth in the margin of aperture 16 may remain about the same for each form of the invention.

FIG. 9 discloses a further modified form of the insert, wherein a separate head 21*d* is of washer form having a cylindrical central bore closely fitted upon the cylindrical lateral wall of a reduced neck 75*d* and seated against an annular shoulder defined by the shoulder portion 70*b* of tubular body 20*d*. A plurality of annular collars 77*d*, similar to the collars 77–79 of FIG. 7, may be utilized. FIG. 9 shows a further modified feature which can be utilized in any of the forms shown herein, embodying a series of faces 27*d* (e.g. of hexagonal array) on one or more sides of the shoulder portion 70*d* and collars 77*d*, torque-resisting interlock with the potting material; and with annular grooves between the collars 77*d* and shoulder portion 70*d*, for end load-resisting interlock with the potting material. FIG. 9 also discloses a nylon pellet type thread lock 71, as in FIG. 6.

FIG. 10 illustrates the possibility of reducing the preferred number of three anchor teeth down to a lesser number, two being shown at 29*d* on the periphery of head 21*d*.

FIG. 11 illustrates a further possible modification of the insert, wherein the head 21*e* is in the form of a flat washer having a plain cylindrical central opening providing the mouth of threaded bore 24*e*, and having a butt-welded connection, at 80, to the squared end of the shoulder portion 76*e* of tubular body 20*e*. FIG. 11 also illustrates the possibility of utilizing four of the anchor teeth 29*e*.

FIG. 12 illustrates the possibility of utilizing a single anchor tooth 29*f*, embedded in one side of the margin of aperture 16 in sheet 10, with the diametrically opposite side of the circular head 21*f* being wedged against said margin at 81, thus providing two points of retaining engagement of the head in the aperture 16, one being the wedging of tooth 29*f* in its lanced notch in the margin and the other being the pressure engagement of the cylindrical periphery of the head 21*f* against the margin. Such pressure engagement provides less secure attachment than the tooth 29*f*. Also, the insert will be very slightly eccentric in the aperture 16. For these reasons, this modification of the invention is less desirable than the others.

FIGS. 13 and 14 disclose a further modification utilizing one or more radial anchor teeth 29*g* which are relatively low in radial height and relatively wide circumferentially

As shown in FIG. 14, the teeth 29e, at the underside of head 21e, have wedge-shaped ends 85 providing free entry into the skin sheet aperture 16 and exerting a wedging, compressive action against the skin sheet margin as compared to the notching action of the teeth 29 of FIG. 5, with a very slight indenting of the margin 16 (to an extent which may be in the range as low as .0001 to .001 inch). Such indentation is indicated in somewhat exaggerated degree at 86 in FIG. 13.

FIG. 15 illustrates a further modification of the radial anchor tooth, shown at 29*h*, which is roughly intermediate between the forms shown in FIG. 5 and FIG. 13. At the inner side of head 21*h* the teeth 29*h* may have either the wedging ends shown at 85 in FIG. 14 or sharp-edged squared ends for notching the skin sheet margin in a manner generally similar to that of teeth 29 of FIG. 5.

The modified form of insert shown in FIG. 7 may be utilized, either with the threaded bore 24*h*, or with a plain cylindrical bore to receive a bolt or rivet.

One of the important advantages of our improved insert and installation is the ease with which they can be utilized in either vertical or overhead panels.

It should be understood that the invention, as it relates to the insert, is not restricted to any specific configuration in the means on the insert body for interlocking engagement with the body of potting material. Any projection, recess or surface of non-circular cross-section which will establish a shear relationship to the contacting potting material, sufficient to provide adequate torque load holding action, may be employed.

We claim:

An insert for installation in a sandwich panel embodying a fragile, low density core sandwiched between spaced skins of solid sheet material, and having a hole beginning with a circular aperture in one of said skin sheets, extending through said core and terminating adjacent the other skin sheet, said insert comprising: a mounting head of circular disc form of a diameter to fit closely within said aperture and having a port therein, adapted to receive the tip of a nozzle of a potting material injection gun, said head also having an inspection port, and a hollow body providing a fastener-receiving bore and of a diameter smaller than said head, extending axially therefrom and receivable in said hole within said core and adapted to receive a fastener element, said inspection port functioning to indicate the filling of said hole around said insert when potting material commences to exude therefrom, said ports being disposed eccentrically with reference to said bore and on opposite sides thereof.

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