

[54] FASTENER
 [75] Inventor: Toshitsugu Furuya, Hyogo, Japan
 [73] Assignee: Furuya Kogyo Kabushiki Kaisha, Hyogo, Japan
 [22] Filed: Aug. 16, 1973
 [21] Appl. No.: 388,788

2,111,267	3/1938	Hoppenstand.....	85/4
2,529,420	11/1950	Ramquist.....	24/214
2,610,879	9/1952	Pope.....	24/208 A
3,210,820	10/1965	Humiston.....	24/208 A
3,251,260	5/1966	Serdechny.....	85/7
3,561,074	2/1971	Mosher.....	24/208 A

FOREIGN PATENTS OR APPLICATIONS

268,500	10/1963	Australia.....	24/208 A
---------	---------	----------------	----------

[30] Foreign Application Priority Data
 Aug. 16, 1972 Japan..... 47-82277

Primary Examiner—Marion Parsons, Jr.
 Attorney, Agent, or Firm—Armstrong, Nikaido & Wegner

[52] U.S. Cl. 24/214; 24/208 A; 85/4; 85/7
 [51] Int. Cl.²..... A44B 17/00
 [58] Field of Search 85/7, 83, 4; 24/208 A, 24/213 CS, 213 R, 214

[57] ABSTRACT

A fastener comprising a main piece member and a counterpart piece member which permits temporary fastening and the permanent fastening once the articles to be joined are correctly positioned. The main piece member includes an inserter provided with an extruded skirt which is fitted into apertures in the counterpart piece member.

[56] References Cited
 UNITED STATES PATENTS
 433,696 8/1890 Raudnitz..... 24/214
 1,872,014 8/1932 Schjolin..... 85/4
 2,062,057 11/1936 Hobby..... 24/214

2 Claims, 5 Drawing Figures

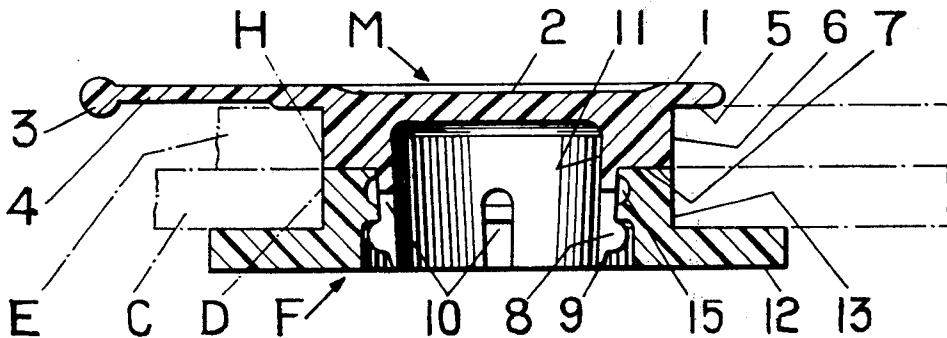


FIG-1

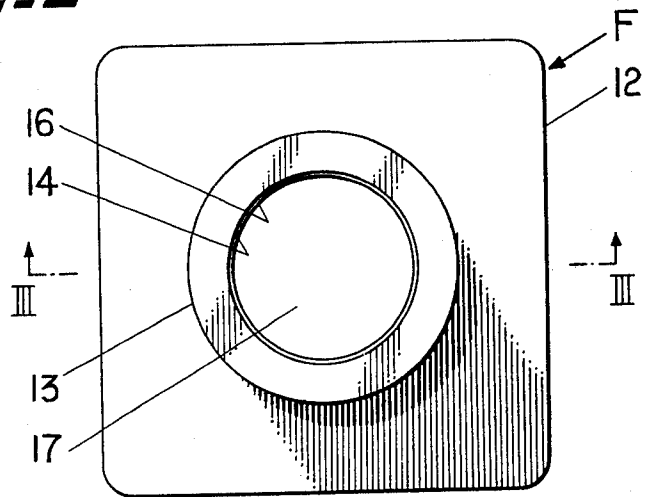


FIG-2

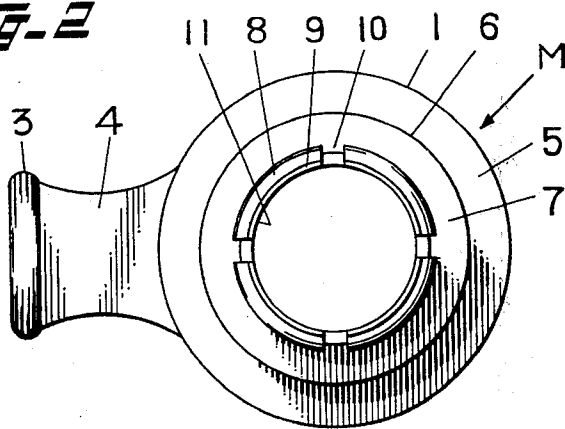


FIG-3

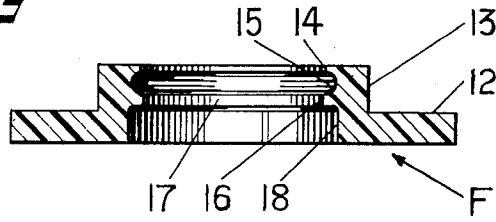


FIG-4

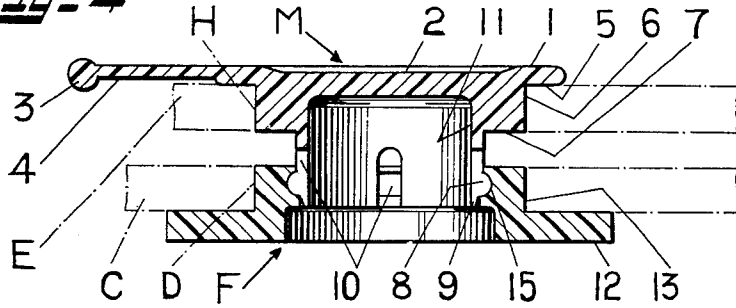
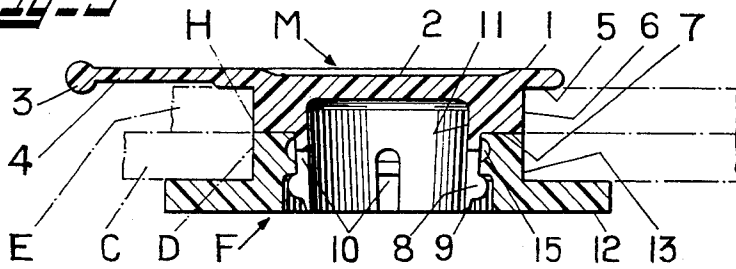


FIG-5



FASTENER

BACKGROUND OF THE INVENTION

The present invention relates to a fastening device comprised of a main element and a counterpart element designed to structurally cooperate to produce a fastening result by the joinder of these elements in a fixed manner in cooperation with articles that are intended to be joined.

In the past, there have been a variety of fastening devices which have been employed with regard to the holding together of articles of various kinds. These fastening devices are of numerous types, structures and classes. However, there have been a variety of disadvantages and deficiencies associated with these devices. In general, they have tended to be ineffective with regard to resistance to loosening of articles that are held together as well as regard to the passage of time in general. Moreover, known devices for fastening articles together have been relatively ineffective in establishing the necessary degree of permanency with regard to the holding together of articles that are designed to be and adapted to be fastened.

Attempts to remedy the defects and drawbacks of past devices have been very few and progress in this regard has been only minimal at best.

The primary object of the present invention is to provide a fastening device which overcomes the problems and deficiencies associated with past devices involving the fastening together of given articles.

Another object of the present invention is to provide a fastening device which includes a combination of a main element and a counterpart element which are designed to structurally cooperate to produce the resulting device and its associated effect upon the articles to be fastened.

Another object of the present invention is to provide a fastening device which is simple and inexpensive of construction and operation and which is not prone to fail in its operation due to the passage of time or to the handling of the article fastened or the manipulation thereof.

A still further object of the present invention is to provide a fastening device which is adaptable to and capable of fastening a variety of different types of articles under a variety of circumstances without the necessity of accessory elements or tightening tools or related ingredients.

Yet another object of the invention is to provide a device of the class indicated which is capable of the functions referred to and is based upon the principles of structural and mechanical cooperation such that a tight and lasting adherence of articles designed to be fastened can occur.

Other objects will appear hereinafter.

SUMMARY OF THE INVENTION

Generally, in accordance with the present invention, a device in the form of a fastening structural arrangement is provided which consists of a main element and a counterpart element designed to structurally cooperate to produce a fastening result and wherein the main element has a cylindrical insert portion located in the bottom thereof and wherein the insert portion is provided with an extruded skirt element and a predetermined number of slots in the open end thereof and, further, where the counterpart element has a cylindrical

head portion in the center thereof and a flange portion around the cylindrical head with the cylindrical head being provided with a series of respectively communicable apertures appropriately arranged and sized.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more particularly described by way of example illustrated in the accompanying drawings in which:

FIG. 1 is a plan view of a counterpart piece member of this invention;

FIG. 2 is a bottom view of a main piece member;

FIG. 3 is a sectional view taken along line III—III of FIG. 1;

FIG. 4 is a sectional view showing the main piece member temporarily attached to the counterpart piece member;

FIG. 5 is a sectional view showing the counterpart piece member permanently joined to the main piece member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A main piece member M has a shallow depression 2 in the center of the seat face 1, which has a pick-up piece 4 with a hook 3 extended forwardly in the tip end. The seat face 1 has an outer-lower bottom face 5 and an inner bottom face 7, with the interposition of a vertical side wall 6. The main piece M has a cylindrical inserter 11 fitted in the bottom end, which cylindrical inserter has an extruded skirt 8 with a semi-circle cross section around the lower end. The lower side of the extruded skirt 8 is extended downwards to the bottom end of the inserter 11 to form an inwardly slant wall 9. In addition, the cylindrical inserter 11 has an appropriate number of slots 10 in the ridge of the bottom end.

A counterpart piece member F has a cylindrical head 13 in the center thereof, and has a flange 12 functioning as a seat. The cylindrical head 13 has an aperture 14 of smaller diameter than the outside diameter of the extruded skirt 8. In the aperture 14 there is provided a ring-shaped groove 15, below which there is provided a projecting inside wall or shoulder member 16 defining a further aperture 17 which is slightly smaller than that of the aperture 14. The aperture 17 communicates with a third aperture or space 18 of relatively large diameter.

The main piece member M and the counterpart piece member F are molded in one body of plastic material of sufficient hardness and elasticity.

As illustrated in FIG. 4, both piece members M and F are joined or jointed into articles. Initially, an adhesive is coated on the circumferential surface of the cylindrical head 13 and the surface of the flange 12, and then the cylindrical head 13 is passed into the precut aperture D of an article C which is to be fastened, while the flange surface 12 is pressed against the article C. Hence, the counterpart piece member F is secured to the article C. On the other hand, the main piece member M is joined or jointed to a second article E, with the vertical side wall 6 held in the precut aperture H of the article. The outer bottom face 5 is fixed to the edge portion of the aperture H by high frequency welding or it may be bonded with an adhesive.

According to the present invention, the main piece member M has the cylindrical inserter 11 fitted in the bottom open end, the cylindrical inserter being pro-

vided with the extruded skirt 8 of a ring-shape including the inwardly-slanting outside wall 9 towards the bottom end and with an appropriate number of slots made lengthwisely in the bottom end, while the counterpart piece member F has a passageway consisting of three apertures 14, 17 and 18. The aperture 14 has a smaller diameter than the outside diameter of the extruded skirt 8, the aperture 17 is slightly more narrowed by the projecting inside wall 16 than the aperture 14, and the aperture 18 is in communication with the apertures 14 and 17, having a relatively large diameter to accommodate the extruded skirt 8. Accordingly, when the main piece member M and the counterpart piece member F are engaged, the extruded skirt 8 is initially fitted in the round groove 15 as illustrated in FIG. 4, thereby enabling the fastener to be temporarily anchored. Subsequently, the seat face 1 of the main piece member M is pressed strongly, the extruded skirt 8 is forced into the aperture 18 against the stress of the projecting inside wall 16, during which the open end of each slot 10 is forcibly narrowed. Thus, the joint of both members M and F is secured, as illustrated in FIG. 5. In the course of the joining operation, the slant wall 9 guides the main piece member M to fit into the aperture 14 of the counterpart piece member F even when the slant wall 9 is slightly biased in relation to the round groove 15 having a larger diameter than that of itself. Thus, temporary attachment is easily obtained, thereby eliminating difficulty in joining members M and F. This will be of particular advantage when a number of fasteners are quickly attached, or when they are attached by groping.

As is evident from the foregoing description, both piece members M and F are temporarily attached prior to their real or permanent joint, with the extruded skirt 8 of the main piece member M held in the round groove 15 of the counterpart piece member F. Consequently, it is possible during the temporary attachment that the main piece member M is adequately positioned or placed in relation to the counterpart piece member F or vice versa, and the articles to be joined or jointed are correctly aligned to avoid maladaptation. This is advantageous when valuable or precious articles are joined or jointed. In addition, both piece members M and F are finally joined or jointed by virtue of the fact that the counter piece member F has a passageway slightly narrowed by the projecting inside wall 16 in comparison with the entrance aperture 14, thereby preventing the extruded skirt 8 from slipping out of the aperture 18 of the counterpart piece member F. Thus, a fastener of this invention is adapted for fastening rela-

tively heavy articles or for fastening articles for a relatively long period of time.

According to the present invention, the counterpart piece member F is integrally molded with a simple construction of flange 12 and cylindrical head 13, and when it is joined or jointed to a rigid article C, it is simply done by inserting the cylindrical head 13 into an aperture of the article or bonding the former therein without the need of any tightening tools or parts, thereby considerably increasing the economy of production.

Furthermore, the main piece member M holds an article E in lower-outer bottom face 5 and the vertical side wall 6 without the help of any fastening accessories, thereby reducing the production cost.

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. A fastener comprising a counterpart element and a main element which is insertable into said counterpart element, said main element having a cylindrical insert portion including an extruded skirt element having a radially extending first portion of semi-circular cross-section and a second leading end portion with walls tapered towards the axis of the cylindrical insert portion and a plurality of slots in the open end thereof, said counterpart element including a cylindrical head portion in the center thereof and a flange portion around said cylindrical head, the cylindrical head comprising in sequence a first aperture means having a diameter smaller than the diameter of said first portion of said skirt element and a ring shaped groove for loosely engaging said first portion of said skirt element therein, shoulder means having a diameter less than the diameter of said first aperture means, and a second aperture means having a diameter greater than the diameter of said skirt element wherein when said main element is partially inserted into said counterpart element, said first aperture means engages said skirt element to temporarily hold said main element in said counterpart element and when said main element is completely inserted into said counterpart element said skirt element is firmly held in said second aperture means by said shoulder means.

2. The fastener of claim 1 wherein said main element includes a hook means extending therefrom.

* * * * *

55

60

65