

US Patent & Trademark Office

Patent Public Search | Text View

United States Patent	12392368
Kind Code	B2
Date of Patent	August 19, 2025
Inventor(s)	Wang; Ting-Jui

Fastener structure

Abstract

A fastener structure includes a head portion, rod member and fitting member. The head portion has a lateral holding portion and vertical receiving portion. The rod member has a lateral attaching portion and engaging member. The rod member is penetratingly disposed at the receiving portion to allow the attaching portion to correspond in position to the holding portion. The fitting member is penetratingly disposed at the attaching portion and the holding portion to fit the head portion and the rod member together. To couple two objects together, the head portion drives an engaging portion of the rod member, such that the engaging portion penetrates one object before being fastened to the other object. To unfasten the objects, the head portion is moved reversely to remove the engaging portion from the other object, effecting separation of the objects, so as to achieve quick coupling and easy unfastening.

Inventors:	Wang; Ting-Jui (New Taipei, TW)
Applicant:	Wang; Ting-Jui (New Taipei, TW)
Family ID:	1000008768235
Appl. No.:	18/629968
Filed:	April 09, 2024

Prior Publication Data

Document Identifier	Publication Date
US 20240255015 A1	Aug. 01, 2024

Foreign Application Priority Data

TW	108140322	Nov. 06, 2019
----	-----------	---------------

Related U.S. Application Data

Publication Classification

Int. Cl.: **F16B5/08** (20060101); **F16B5/10** (20060101); **F16B17/00** (20060101)

U.S. Cl.:

CPC **F16B17/008** (20130101); **F16B5/08** (20130101); **F16B5/10** (20130101);

Field of Classification Search

CPC: F16B (5/08); F16B (5/10); F16B (2/18); F16B (2/185); F16B (21/02); F16B (21/04)

References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
3402958	12/1967	Barry	292/62	E05C 3/042
5361925	12/1993	Wecke	220/325	H02G 3/14
5779422	12/1997	Petignat	411/553	F16B 39/28
5885022	12/1998	Maughan	403/135	F16C 11/0642
10294971	12/2018	Wu	N/A	F16B 5/0635
12078195	12/2023	Wang	N/A	F16B 5/10
2003/0156923	12/2002	Winkler	411/552	F16B 7/105
2004/0083586	12/2003	Bentrim	24/458	F16B 19/109
2011/0123291	12/2010	Chiu	411/342	F16B 5/0208
2012/0301244	12/2011	Chiu	411/166	F16B 21/02
2013/0183086	12/2012	Wang	403/327	F16B 5/0642
2014/0093326	12/2013	Wang	411/103	F16B 5/0208
2014/0105707	12/2013	Tseng	411/508	F16B 21/04
2016/0003271	12/2015	Wang	403/322.4	F16B 17/006
2017/0074303	12/2016	Bowers	N/A	F16B 5/10
2017/0102017	12/2016	Wang	N/A	F16B 5/08
2017/0146050	12/2016	Wang	N/A	F16B 5/0208
2017/0320674	12/2016	Wang	N/A	F16C 29/046
2018/0202481	12/2017	Wu	N/A	F16B 21/02

Primary Examiner: Wiley; Daniel J

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION (1) This application is a continuation application of U.S. application Ser. No. 16/896,188 filed on Jun. 8, 2020, the entire contents of which are hereby incorporated by reference for which priority is claimed under 35 U.S.C. § 120.

BACKGROUND OF THE INVENTION

1. Field of the Invention

(1) The present disclosure relates to fastener structures, and in particular to a fastener structure capable of fastening at least two objects in place to achieve quick coupling and easy unfastening.

2. Description of the Related Art

(2) Conventionally, coupling together two objects requires fastening the two objects together with screws in an inseparable manner to ensure that the two objects are firmly coupled together and thus cannot be easily separated.

(3) Although the aforesaid prior art is effective in coupling together two objects to render them inseparable, the aforesaid prior art not only fails to render the coupling process easy but its use of screws also renders the two objects difficult to unfasten.

(4) Therefore, it is important to provide a fastener structure with simple structure and ease of use to overcome drawbacks of the prior art.

BRIEF SUMMARY OF THE INVENTION

(5) An objective of the present disclosure is to provide a fastener structure capable of quick coupling and easy unfastening.

(6) To achieve at least the above objective, the present disclosure provides a fastener structure, comprising: a head portion having a receiving portion and a holding portion; a rod member having an engaging portion and an attaching portion and penetratingly disposed at the receiving portion, the attaching portion corresponding in position to the holding portion; and a fitting member penetratingly disposed at the attaching portion and the holding portion.

(7) Regarding the fastener structure, the head portion is round, handle-shaped, drop-shaped, wing-shaped, polyhedral, step-shaped or flaring.

(8) Regarding the fastener structure, the receiving portion of the head portion is a vertical, transverse or lateral penetrating hole or recess portion.

(9) Regarding the fastener structure, the holding portion of the head portion or the attaching portion of the rod member is a lateral, vertical or transverse penetrating hole or recess portion.

(10) Regarding the fastener structure, the holding portion of the head portion or the attaching portion of the rod member is a lateral penetrating hole.

(11) Regarding the fastener structure, a holding portion of the head portion has a recess portion for receiving an expanding portion or a stopping portion of the fitting member.

(12) Regarding the fastener structure, a top surface of the rod member has a force-applying portion whereby a tool operates.

(13) Regarding the fastener structure, an engaging portion of the rod member is a cylindrical member, thread member, outer engaging member or inner engaging member.

(14) Regarding the fastener structure, the engaging portion of the rod member penetrates a first object before being fastened to a second object.

(15) Regarding the fastener structure, the fitting member is a rod member, engaging member, resilient member or expanding member.

(16) Regarding the fastener structure, the fitting member has a stopping portion or an expanding portion.

(17) The fastener structure further comprises a resilient component for use in movable fitting or fixed fitting.

(18) The fastener structure further comprises a body portion for use in movable fitting.

(19) Regarding the fastener structure, the body portion has a fitting portion adapted to be fitted to a first object or integrally formed with the first object.

(20) Regarding the fastener structure, the diameter of the fitting portion is greater than, less than or equal to the diameter of the head portion.

(21) Regarding the fastener structure, the fitting portion is fitted to the first object by riveting,

expanding, welding, fastening, adhering or soldering.

(22) Regarding the fastener structure, the head portion or the body portion has a checking portion for checking and being fitted to each other or for checking and being fitted to the rod member.

(23) The fastener structure further has a resilient component having an end abutting against the head portion and another end abutting against the body portion, or having an end abutting against the body portion and another end abutting against the rod member or the engaging portion.

(24) Regarding the fastener structure, the body portion has an inner thread, and the engaging portion is an outer thread, such that, owing to coordination of the inner thread and the outer thread, the checking portion of the head portion is insertedly engaged with the checking portion of the body portion.

(25) Regarding the fastener structure, the fastener structure is disposed in a carrier.

(26) Regarding the fastener structure, the carrier has a cover.

(27) Regarding the fastener structure, the head portion further has a handle portion or an operating portion.

(28) Regarding the fastener structure, the rod member penetrates and exits an internal hole of the body portion, such that the attaching portion penetrates and exits the body portion, wherein, after the attaching portion has been fitted to the head portion, the fitting member is insertedly disposed in the attaching portion for fitting, such that the rod member is movably fitted to the body portion.

(29) Regarding the fastener structure, the head portion or the body portion has a shoulder space for receiving a resilient component.

(30) Regarding the fastener structure, the width of the rod member is greater than, equal to or less than the width of a blocking portion of the engaging portion. The blocking portion is blocked at an internal hole of the body portion, such that the rod member is movably fitted to the body portion.

(31) Regarding the fastener structure, the body portion has a pressed portion adapted to be pressed or pushed, such that a fitting portion of the body portion presses or abuts against a first object, allowing material of the first object to enter or flow into a material storage space of the fitting portion, so as for the body portion to be fitted to the first object.

(32) Regarding the fastener structure, the body portion is of greater hardness than the first object.

(33) Regarding the fastener structure, the body portion has a pressed portion adapted to be pressed or pushed, such that a fitting portion of the body portion is expanded and fitted to a first object when pressed under an applied force.

(34) Regarding the fastener structure, the fastener structure is disposed in a carrier, taken out of the carrier with a tool, compared with a comparison device, and precisely placed on a first object for fitting.

(35) Regarding the fastener structure, the head portion or the body portion of the fastener structure has a weldable surface weldable to a weldable surface of the first object.

(36) Regarding the fastener structure, solder portions are disposed between the body portion and the first object and adapted to be heated to change to a liquid state and then cooled to change to a solid state, such that the body portion and the first object are fitted to each other.

(37) Regarding the fastener structure, the tool is a vacuum suction device or a clamp, and the first object is a PCB, a metal board or a plastic board.

(38) The fastener structure further comprises a torsion spring. The torsion spring has an end blocked at the head portion and another end blocked at the body portion, or has an end blocked at the body portion and another end blocked at the rod member, such that the head portion or the rod member rotates to and fro because of resilience of the torsion spring.

(39) Regarding the fastener structure, the pressed portion is disposed beside the head portion, the rod member or the fitting member and is of a greater width than the head portion, the rod member or the fitting member.

(40) Regarding the fastener structure, the head portion rotates about the fitting member to drive the rod member moving and thereby creating a pressed space of the pressed portion.

- (41) Regarding the fastener structure, the head portion rotates about the fitting member to drive the rod member moving.
- (42) Regarding the fastener structure, the head portion has a blocking portion, and the body portion has a corresponding blocking portion, such that the blocking portion and the corresponding blocking portion block each other to limit the rotation or lateral movement of the head portion.
- (43) Regarding the fastener structure, the blocking portion or the corresponding blocking portion is a raised portion, dented portion, stepped portion, oblique surface portion, curved surface portion, arcuate surface portion or flatted surface portion.
- (44) Regarding the fastener structure, the body portion has a pressed portion adapted to be pressed or pushed, such that the body portion is fitted to the first object.
- (45) Regarding the fastener structure, the rod member has a blocking portion, and the body portion has a corresponding blocking portion, such that the blocking portion and the corresponding blocking portion block each other to limit the rotation or lateral movement of the head portion.
- (46) Regarding the fastener structure, the blocking portion is a tetrahedron or polyhedron, and the corresponding blocking portion is a tetrahedron or polyhedron; or the blocking portion is a blocking raised member, and the corresponding blocking portion is a corresponding blocking dented member; or the blocking portion is a blocking dented member, and the corresponding blocking portion is a corresponding blocking raised member.
- (47) Regarding the fastener structure, the head portion has a tool control portion which comprises the rod member and the fitting member.
- (48) The fastener structure further comprises a tool corresponding in position to the tool control portion to control the fastener structure.
- (49) Regarding the fastener structure, the tool is a vacuum suction device, and the head portion is an airtight structure disposed above the rod member, such that the fastener structure is attracted to the vacuum suction device by suction.
- (50) Regarding the fastener structure, the tool control portion is the space within the head portion, disposed on two sides of the fitting member, and lower than the upper end of the head portion.
- (51) Regarding the fastener structure, the head portion is formed by intra-mold injection molding, including plastic intra-mold injection, metal intra-mold injection or nonmetal intra-mold injection, wherein a mold has a sprue and a gate, and liquid material is admitted into a hollow intra-mold head portion space from the gate and thus cooled and solidified to form the head portion.
- (52) Therefore, the fastener structure of the present disclosure works as follows: to couple two objects together, the head portion drives the engaging portion of the rod member, such that the engaging portion penetrates the first object before being fastened to the second object. To unfasten the two objects, the user moves the head portion reversely, such that the engaging portion is removed from the second object, effecting separation of the first object and the second object, so as to achieve quick coupling and easy unfastening.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

- (1) FIG. 1 is a cross-sectional view of embodiment 1 of the present disclosure.
- (2) FIG. 2 is a perspective view of embodiment 2 of the present disclosure.
- (3) FIG. 3 is a cross-sectional view of embodiment 2 of the present disclosure.
- (4) FIG. 4 is a schematic view of usage state of embodiment 2 of the present disclosure.
- (5) FIG. 5 is a schematic view of usage state of embodiment 2 of the present disclosure.
- (6) FIG. 6 is a schematic view of storage of a fastener structure of the present disclosure.
- (7) FIG. 7 is a cross-sectional view of embodiment 3 of the present disclosure.
- (8) FIG. 8 is a cross-sectional view of embodiment 4 of the present disclosure.

- (9) FIG. **9** is a cross-sectional view of embodiment 5 of the present disclosure.
- (10) FIG. **10** is a cross-sectional view of embodiment 6 of the present disclosure.
- (11) FIG. **11** is a cross-sectional view of embodiment 7 of the present disclosure.
- (12) FIG. **12** is a cross-sectional view of embodiment 7 of the present disclosure.
- (13) FIG. **13** is a cross-sectional view of embodiment 8 of the present disclosure.
- (14) FIG. **14** is a cross-sectional view of embodiment 9 of the present disclosure.
- (15) FIG. **15** is a cross-sectional view of embodiment 10 of the present disclosure.
- (16) FIG. **16** is a schematic view of assembly state of embodiment 11 of the present disclosure.
- (17) FIG. **17** is a cross-sectional view of embodiment 12 of the present disclosure.
- (18) FIG. **18** is a perspective view of embodiment 13 of the present disclosure.
- (19) FIG. **19** is a schematic view of assembly state of embodiment 13 of the present disclosure.
- (20) FIG. **20** is a schematic view of assembly state of embodiment 14 of the present disclosure.
- (21) FIG. **21** is a schematic view of assembly state of embodiment 15 of the present disclosure.
- (22) FIG. **22** is a cross-sectional view of embodiment 16 of the present disclosure.
- (23) FIG. **23** is a cross-sectional view of embodiment 17 of the present disclosure.
- (24) FIG. **24** is a cross-sectional view of embodiment 18 of the present disclosure.
- (25) FIG. **25** is a schematic view of assembly state of embodiment 19 of the present disclosure.
- (26) FIG. **26** is a schematic view of usage state of embodiment 20 of the present disclosure.
- (27) FIG. **27** is a cross-sectional view of embodiment 21 of the present disclosure.
- (28) FIG. **28** is a perspective view of embodiment 21 of the present disclosure.
- (29) FIG. **29** is a perspective view of embodiment 22 of the present disclosure.
- (30) FIG. **30** is a perspective view of embodiment 23 of the present disclosure.
- (31) FIG. **31** is a perspective view of embodiment 24 of the present disclosure.
- (32) FIG. **32** is a schematic view of usage state of embodiment 25 of the present disclosure.
- (33) FIG. **33** is a schematic view of usage state of embodiment 26 of the present disclosure.
- (34) FIG. **34** is a perspective view of a tool according to embodiment 27 of the present disclosure.
- (35) FIG. **35** is a schematic lateral view of the tool according to embodiment 27 of the present disclosure.
- (36) FIG. **36** is a schematic bottom view of the tool according to embodiment 27 of the present disclosure.
- (37) FIG. **37** is a perspective view of embodiment 28 of the present disclosure.
- (38) FIG. **38** is a schematic top view of embodiment 28 of the present disclosure.
- (39) FIG. **39** is a schematic cross-sectional view of embodiment 28 of the present disclosure.
- (40) FIG. **40** is a schematic view of usage state of embodiment 28 of the present disclosure.
- (41) FIG. **41** is a schematic view of production state of embodiment 29 of the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

- (42) To facilitate understanding of the object, characteristics and effects of this present disclosure, embodiments together with the attached drawings for the detailed description of the present disclosure are provided.
- (43) Referring to FIG. **1** through FIG. **5**, a fastener structure **1** of the present disclosure essentially comprises a head portion **11**, a rod member **12** and a fitting member **13**.
- (44) The head portion **11** has a receiving portion **111** and a holding portion **112**. The head portion **11** is round, handle-shaped, drop-shaped, wing-shaped, polyhedral, step-shaped or flaring, as needed.
- (45) The rod member **12** has an engaging portion **121** and an attaching portion **122**. The rod member **12** is penetratingly disposed at the receiving portion **111** and causes the attaching portion **122** to correspond in position to the holding portion **112**. The engaging portion of the rod member is a cylindrical member, thread member, outer engaging member or inner engaging member as needed.
- (46) The fitting member **13** is penetratingly disposed at the attaching portion **122** and the holding

portion **112**. The head portion **11** and the rod member **12** are fixed to each other and are not rotatable and movable relative to each other. The fitting member is a rod member, engaging member, resilient member or expanding member.

(47) The receiving portion **111** of the head portion **11** is a vertical, transverse or lateral penetrating hole or recess portion. The holding portion **112** of the head portion **11** and the attaching portion **122** of the rod member **12** are lateral, vertical or transverse penetrating holes or recess portions. In this embodiment, the holding portion **112** of the head portion **11** and the attaching portion **122** of the rod member **12** are lateral penetrating holes.

(48) The fastener structure **1** further comprises a body portion **14** movably fitted to the head portion **11**. The body portion **14** has a fitting portion **141**. The outer diameter of the fitting portion **141** is greater than, less than or equal to the outer diameter of the head portion **11**. The head portion **11** and the body portion **14** have checking portions **113**, **142**, respectively, for checking and being fitted to each other. The fastener structure **1** further has a resilient component **15** for use in movable fitting or fixed fitting.

(49) Assembly of the fastener structure **1** at least requires the following steps:

(50) Step 1: inserting the rod member **12** into the receiving portion **111** of the head portion **11**.

(51) Step 2: aligning the attaching portion **122** of the rod member **12** with the holding portion **112** of the head portion **11**.

(52) Step 3: inserting fitting member **13** into the holding portion **112** and the attaching portion **122**, such that the fitting member **13** fits the head portion **11** and the rod member **12** together.

(53) Mounting the body portion **14** in place requires the checking portion **142** of the body portion **14** and the checking portion **113** of the head portion **11** (or rod member **12**) to check each other, such that the body portion **14** is movably fitted to the head portion **11**. Before the head portion **11** and the rod member **12** are mounted in place, or before the body portion **14** and the head portion **11** are mounted in place, the resilient component **15** is fitted around the rod member **12**, such that the resilient component **15** has one end abutting against the body portion **14** and the other end abutting against the engaging portion **121** of the rod member **12**.

(54) Starting to use the fastener structure entails fitting the fitting portion **141** of the body portion **14** to a first object **2** by riveting, expanding, welding, fastening, adhering or soldering, or allowing the fitting portion **141** of the body portion **14** to be integrally formed with the first object **2**. Then, the user exerts a pulling force on the head portion **11**, such that the head portion **11** drives the engaging portion **121** of the rod member **12** upward to thereby compress the resilient component **15**. After that, the user places a second object **3** on the first object **2** and then releases the head portion **11**, such that the resilient component **15** is released to thereby push the engaging portion **121** (and drive the head portion **11**); thus, the engaging portion **121** of the rod member **12** penetrates the first object **2** before being fastened to the second object **3**.

(55) To unfasten the first object **2** and the second object **3**, the user pulls the head portion **11** again, such that the head portion **11** drives the engaging portion **121** of the rod member **12** upward to thereby compress the resilient component **15**. At this point in time, the engaging portion **121** separates from the second object **3**, thereby causing separation of the first object **2** and the second object **3**. Therefore, the present disclosure achieves quick coupling and easy unfastening.

(56) Referring to FIG. **6**, in this embodiment, a plurality of fastener structures **1** are disposed in a carrier **4**, and the carrier **4** has a cover **41**. Therefore, storage of the fastener structure **1** is effected.

(57) Referring to FIG. **7**, in this embodiment, the engaging portion **121a** of the rod member **12a** is an outer thread. The resilient component **15a** has one end abutting against the head portion **11a** and the other end abutting against the body portion **14a**. The checking portion **142a** of the body portion **14a** and the rod member **12a** check each other and is fitted to each other.

(58) Referring to FIG. **8**, in this embodiment, the engaging portion **121b** of the rod member **12b** is an outer engaging member. The resilient component **15b** has one end abutting against the head portion **11b** and the other end abutting against the checking portion **142b** of the body portion **14b**.

The checking portion **142b** of the body portion **14b** and the rod member **12b** check each other.

(59) Referring to FIG. 9, in this embodiment, the engaging portion **121c** of the rod member **12c** is an inner engaging member. The resilient component **15c** has one end abutting against the head portion **11c** and the other end abutting against the body portion **14c**. The checking portion **113c** of the head portion **11c** and the checking portion **142c** of the body portion **14c** check each other. In this embodiment, the checking portion **113c** of the head portion **11c** and the checking portion **142c** of the body portion **14c** are engaging members fastened to each other.

(60) Referring to FIG. 10, in this embodiment, the head portion **11d** is a handle, whereas the engaging portion **121d** of the rod member **12d** is an outer thread. The resilient component **15d** has one end abutting against the head portion **11d** and the other end abutting against the body portion **14d**. The checking portion **142d** of the body portion **14d** and the rod member **12d** check each other.

(61) Referring to FIG. 11 and FIG. 12, in this embodiment, the checking portion **113e** of the head portion **11e** is a resilient member and is deformed under an applied force to thereby insertedly engage with the checking portion **142e** of the body portion **14e**, such that the head portion **11e** is movably fitted to the body portion **14e**. The top surface of the rod member **12e** has a force-applying portion **123e**, such that a tool (not shown) can operate. The body portion **14e** has an inner thread **143e**. The engaging portion **121e** is an outer thread. Owing to coordination of the inner thread **143e** and the outer thread of the engaging portion **121e**, the checking portion **113e** of the head portion **11e** is insertedly engaged with the checking portion **142e** of the body portion **14e**.

(62) Referring to FIG. 13, in this embodiment, two ends of the holding portion **112f** of the head portion **11f** have recess portions **114f**, **115f**, respectively. The fitting member **13f** has one end having a stopping portion **131f** and the other end having an expanding portion **132f**. The recess portions **114f**, **115f** store the stopping portion **131f** and the expanding portion **132f** at the two ends of the fitting member **13f**, respectively.

(63) Assembly of the fastener structure entails insertedly disposing the rod member **12f** in the receiving portion **111f** of the head portion **11f** to allow the attaching portion **122f** of the rod member **12f** to correspond in position to the holding portion **112f** of the head portion **11f**, insertedly disposing the fitting member **13f** in the holding portion **112f** and the attaching portion **122f**, fitting the head portion **11f** and the rod member **12f** together by the fitting member **13f**, blocking the stopping portion **131f** of the fitting member **13f** by the recess portion **114f** of the head portion **11f**, and allowing the expanding portion **132** of the fitting member **13f** to expand and deform under an applied force expanding so as to be blocked by another recess portion **115f** of the head portion **11f**.

(64) Referring to FIG. 14 and FIG. 15, in this embodiment, the head portion **11** further has a handle portion **116** (shown in FIG. 14), or the head portion **11** further has an operating portion **117** (shown in FIG. 15). Therefore, to start using the fastener structure, the handle portion **116** or the operating portion **117** exerts a force on the head portion **11**, such that the head portion **11** drives the rod member **12** fastening in place. Therefore, the present disclosure meets practical operation-related and usage-related needs.

(65) Referring to FIG. 16, in this embodiment, the rod member **12** penetrates and exits an internal hole **144** of the body portion **14**, such that the attaching portion **122** penetrates and exits the body portion **14**. After the attaching portion **122** has been fitted to the head portion **11**, the fitting member **13** is insertedly disposed in the attaching portion **122**, such that the rod member **12** is movably fitted to the body portion **14**. The head portion **11** has a shoulder space **118**. The shoulder space **118** receives a resilient component **15**. The rod member **12** is of a width greater than (equal to or less than) the width of a blocking portion **124** of the engaging portion **121**. The blocking portion **124** is blocked at an internal hole **144** of the body portion **14**, such that the rod member **12** is movably fitted to the body portion **14**. Therefore, to start using the fastener structure, the user exerts a force on the head portion **11**, such that the head portion **11** drives the engaging portion **121** of the rod member **12** downward to thereby compress the resilient component **15**; thus, the engaging portion **121** is fastened to the second object (not shown). To unfasten the engaging

portion **121**, the user exerts a force on the head portion **11** again, such that the head portion **11** drives the engaging portion **121** of the rod member **12** moving and releases the resilient component **15** to thereby separate the engaging portion **121** from the second object, so as to achieve quick coupling and easy unfastening.

(66) Referring to FIG. **17**, in this embodiment, the body portion **14** has a shoulder space **145**. The shoulder space **145** contains a resilient component **15**. Therefore, the present disclosure meets practical operation-related and usage-related needs.

(67) Referring to FIG. **18** and FIG. **19**, in this embodiment, the body portion **14** has a pressed portion **146**. A tool **5** has a recess to receive the head portion **11**. The tool **5** directly presses or abuts against the pressed portion **146** under an applied force, such that a fitting portion **147** of the body portion **14** presses a first object **2**; thus, the material of the first object **2** enters or flows into a material storage space **1471** of the fitting portion **147** to allow the body portion **14** to be fitted to the first object **2**. The body portion **14** is of greater hardness than the first object **2**. Therefore, the body portion **14** is firmly fitted to the first object **2** to facilitate subsequent related operation.

(68) Referring to FIG. **20**, in this embodiment, the body portion **14** has a pressed portion **146**. A tool **5** presses or abuts against the pressed portion **146** under an applied force, such that a fitting portion **147** of the body portion **14** is expanded and fitted to a first object **2** when pressed by another tool **6** under an applied force, thereby allowing the body portion **14** to be fitted to the first object **2**. Therefore, the body portion **14** is firmly fitted to the first object **2** to facilitate subsequent related operation.

(69) Referring to FIG. **21**, in this embodiment, the fastener structure **1** is disposed in a carrier **7**. The fastener structure **1** is taken out of the carrier **7** with a tool **8** and then compared with a comparison device **9**. After that, the fastener structure **1** is precisely placed on a first object **2** for fitting. In this embodiment, the body portion **14** (or head portion **11**) of the fastener structure **1** has a weldable surface **148** weldable to a weldable surface **21** of the first object **2**. The weldable surfaces **148**, **21** are solder portions between the body portion **14** and the first object **2**. The solder portions are heated to change to a liquid state and then cooled to change to a solid state; thus, the body portion **14** and the first object **2** are fitted to each other. The tool **8** is a vacuum suction device or a clamp. The first object is a PCB, a metal board or a plastic board. Therefore, the body portion **14** is firmly fitted to the first object **2** to facilitate subsequent related operation.

(70) The tool **8** is a vacuum suction device. The head portion **11** is an airtight structure disposed above the rod member **12**, such that the fastener structure **1** is attracted to the vacuum suction device by suction.

(71) Referring to FIG. **22** through FIG. **24**, in this embodiment, the fastener structure **1** further comprises a torsion spring **16**. The torsion spring **16** has one end blockedly disposed at the head portion **11** and the other end blocked at the body portion **14** (shown in FIG. **22** and FIG. **23**). Alternatively, the torsion spring **16** has one end blockedly disposed at the body portion **14** and the other end blocked at the rod member **12** (shown in FIG. **24**). Thus, the head portion **11** or the rod member **12** rotates to and fro because of resilience of the torsion spring **16**. Therefore, the present disclosure meets practical operation-related and usage-related needs.

(72) Referring to FIG. **25** and FIG. **26**, in this embodiment, the pressed portion **146** is disposed beside the head portion **11**, the rod member **12** and the fitting member **13** and is of a greater width than the head portion **11**, the rod member **12** and the fitting member **13**; thus, the head portion **11** rotates about the fitting member **13** to drive the rod member **12** moving and thereby creating the pressed space of the pressed portion **146**. Consequently, a tool **5** has a recess to receive the head portion **11**. The tool **5** directly presses or abuts against the pressed portion **146** under an applied force, such that a fitting portion **147** of the body portion **14** presses a first object **2**. Therefore, the material of the first object **2** enters or flows into a material storage space **1471** of the fitting portion **147**, thereby allowing the body portion **14** to be fitted to the first object **2**. The body portion **14** is of greater hardness than the first object **2**. Therefore, the body portion **14** is firmly fitted to the first

object 2 to facilitate subsequent related operation. To operate the fastener structure, the user rotates the head portion **11** about the fitting member **13** to drive the rod member **12** moving and thereby being fastened to the second object or separating therefrom.

(73) Referring to FIG. 27 and FIG. 29, in this embodiment, the head portion **11** has a blocking portion **119**, and the body portion **14** has a corresponding blocking portion **148**. The blocking portion **119** and the corresponding blocking portion **148** block each other to stop the head portion **11** rotating relative to the body portion **14** in a circumferential direction of the rod member **12**. The blocking portion **119** and the corresponding blocking portion **148** are raised portion, dented portion, stepped portion, oblique surface portion, curved surface portion, arcuate surface portion or flatted surface portion. Therefore, the present disclosure meets practical operation-related and usage-related needs.

(74) Refer to FIG. 30 through FIG. 33 which illustrate this embodiment. The head portion **11** has a blocking portion **119**. The body portion **14** has a corresponding blocking portion **148**. The rod member **12** has a blocking portion **124**. The body portion **14** has another corresponding blocking portion **149**. The blocking portions **119**, **124** and the corresponding blocking portions **148**, **149** block each other to stop the rod member **12** rotating relative to the body portion **14** in a circumferential direction of the rod member **12**.

(75) In an embodiment of the present disclosure, the blocking portions **119**, **124** are tetrahedrons or polyhedrons, and the corresponding blocking portions **148**, **149** are tetrahedrons or polyhedrons (shown in FIG. 30). Alternatively, the blocking portion **119** is a blocking raised member, and the corresponding blocking portion **148** is a corresponding blocking dented member (shown in FIG. 31, FIG. 32). Alternatively, the blocking portion **124** is a blocking dented member, and the corresponding blocking portion **149** is a corresponding blocking raised member (shown in FIG. 33).

(76) Referring to FIG. 34 through FIG. 40, in this embodiment, the head portion **11** has a tool control portion **10**. The tool control portion **10** comprises the rod member **12** and the fitting member **13** (shown in FIG. 37 through FIG. 39). The fastener structure **1** further comprises a tool **101**. The tool **101** has a corresponding control portion **102** (shown in FIG. 34 through FIG. 36) corresponding in position to the tool control portion **10** to control the rod member **12** (shown in FIG. 40) of the fastener structure **1**. The tool control portion **10** is the space within the head portion **11**, disposed on two sides of the fitting member **13**, and lower than the upper end of the head portion **11**.

(77) Referring to FIG. 41, in this embodiment, the head portion **11** is formed with a mold **20** by intra-mold injection molding, including plastic intra-mold injection, metal intra-mold injection or nonmetal intra-mold injection. The mold **20** has a sprue **201**, a gate **202**, an upper mold **203** and a lower mold **204**. A mold closing portion **205** is disposed between the upper mold **203** and the lower mold **204**. Liquid material is admitted into a hollow intra-mold head portion space **206** from the gate **202** and bypasses the holding portion **112** in the hollow intra-mold head portion space **206**, and thus cooled and solidified to form the head portion **11** and the holding portion **112**, the holding portion **112** is hollow.

(78) While the present disclosure has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the present disclosure set forth in the claims.

Claims

1. Fastener structure, comprising: a head portion having a receiving portion and a holding portion; a rod member having an engaging portion and an attaching portion and penetratingly disposed at the receiving portion, the attaching portion corresponding in position to the holding portion; and a fitting member penetratingly disposed at the attaching portion and the holding portion, the head

portion and the rod member are fixed to each other and are not rotatable and movable relative to each other.

2. The fastener structure of claim 1, wherein the holding portion of the head portion has a recess portion for receiving an expanding portion or a stopping portion of the fitting member.

3. The fastener structure of claim 1, wherein the receiving portion of the head portion is a vertical, transverse or lateral penetrating hole or recess portion.

4. The fastener structure of claim 1, wherein the holding portion of the head portion or the attaching portion of the rod member is a lateral, vertical or transverse penetrating hole or recess portion.

5. The fastener structure of claim 1, wherein the fastener structure further comprises a body portion for use in movable fitting.

6. The fastener structure of claim 5, wherein the body portion has a fitting portion adapted to be fitted to a first object or integrally formed with the first object.

7. The fastener structure of claim 6, wherein the fitting portion is fitted to the first object by riveting, expanding, welding, fastening, adhering or soldering.

8. The fastener structure of claim 5, wherein the head portion or the body portion has a checking portion for checking and being fitted to each other or checking and being fitted to the rod member.

9. The fastener structure of claim 5, further comprising a resilient component having an end abutting against the head portion and another end abutting against the body portion, or having an end abutting against the body portion and another end abutting against the rod member or the engaging portion.

10. The fastener structure of claim 5, wherein the rod member penetrates and exits an internal hole of the body portion, such that the attaching portion penetrates and exits the body portion, wherein, after the attaching portion has been fitted to the head portion, the fitting member is insertedly disposed in the attaching portion for fitting, such that the rod member is movably fitted to the body portion.

11. The fastener structure of claim 5, wherein the body portion has a pressed portion adapted to be pressed or pushed, such that a fitting portion of the body portion presses or abuts against a first object, allowing material of the first object to enter or flow into a material storage space of the fitting portion, so as for the body portion to be fitted to the first object.

12. The fastener structure of claim 11, wherein the body portion is of greater hardness than the first object.

13. The fastener structure of claim 11, wherein the pressed portion is disposed beside the head portion, the rod member or the fitting member and is of a greater width than the head portion, the rod member or the fitting member.

14. The fastener structure of claim 5, wherein the body portion has a pressed portion adapted to be pressed or pushed, such that a fitting portion of the body portion is expanded and fitted to a first object when pressed under an applied force.

15. The fastener structure of claim 14, wherein the pressed portion is disposed beside the head portion, the rod member or the fitting member and is of a greater width than the head portion, the rod member or the fitting member.

16. The fastener structure of claim 5, wherein the head portion or the body portion of the fastener structure has a weldable surface weldable to a weldable surface of the first object.

17. The fastener structure of claim 5, wherein solder portions are disposed between the body portion and the first object and adapted to be heated to change to a liquid state and then cooled to change to a solid state, such that the body portion and the first object are fitted to each other.

18. The fastener structure of claim 5, further comprising a torsion spring having an end blocked at the head portion and another end blocked at the body portion, or having an end blocked at the body portion and another end blocked at the rod member, such that the head portion or the rod member rotates to and fro because of resilience of the torsion spring.

19. The fastener structure of claim 1, wherein the fastener structure is disposed in a carrier, taken out of the carrier with a tool, compared with a comparison device, and precisely placed on a first object for fitting.
20. The fastener structure of claim 19, wherein the tool is a vacuum suction device or a clamp, and the first object is a PCB, a metal board or a plastic board.
21. The fastener structure of claim 19, wherein the tool is a vacuum suction device, and the head portion is an airtight structure disposed above the rod member, such that the fastener structure is attracted to the vacuum suction device by suction.
22. The fastener structure of claim 1, wherein the head portion has a tool control portion comprising the rod member and the fitting member.
23. The fastener structure of claim 22, wherein the tool control portion is a space within the head portion and disposed on two sides of the fitting member.
-