

United States Patent

Ishizaki

[15] 3,651,547

[45] Mar. 28, 1972

[54] SOCKET MEMBER OF SNAP FASTENER

[72] Inventor: Hidenosuke Ishizaki, 289-46, Kitahata Motoyama-cho, Higashenada-ku, Kobe, Japan

[22] Filed: July 21, 1970

[21] Appl. No.: 56,919

[52] U.S. Cl. 24/218

[51] Int. Cl. A44b 17/00

[58] Field of Search 24/218, 216, 217

[56] References Cited

UNITED STATES PATENTS

2,665,468	1/1954	Fenton.....	24/218
1,236,116	8/1917	Smith.....	24/218
1,031,022	7/1912	Paetzold	26/218
2,286,438	6/1942	Reiter.....	24/218
1,279,923	9/1918	Simek.....	24/218

FOREIGN PATENTS OR APPLICATIONS

402,002 9/1924 Germany 24/218

Primary Examiner—Bernard A. Gelak
Attorney—J. Y. Houghton

[57]

ABSTRACT

A socket member comprises a main body, a resilient bent wire and a seating element for enclosing the resilient bent wire in the main body. At least two straight portions of the resilient wire spaced apart in parallel by a desired distance are disposed in a recessed portion of the main body for receiving the head of a stud member so as to retain the stud head in engaged position in clamping contact therewith. The socket member has a seating element which is provided with walls defining an annular inclined groove and secured within the body in spaced relation to the bent wires by abutment with the stud receiving portion and the outer walls of the body, so that said seating element receives and effects the upsetting of the prongs of a pronged attaching member.

2 Claims, 9 Drawing Figures

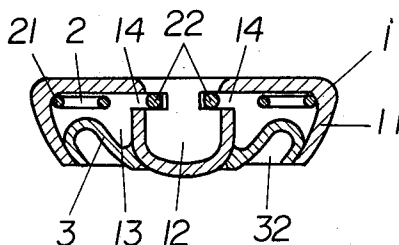


Fig. 1

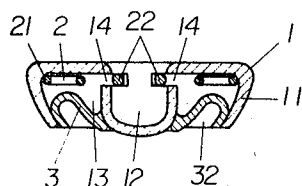


Fig. 2

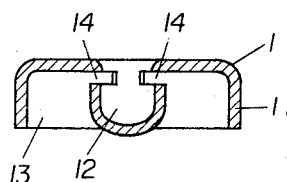


Fig. 3

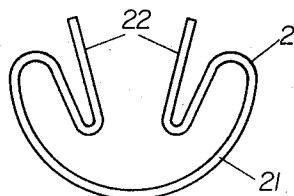


Fig. 4

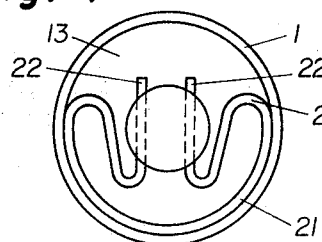


Fig. 5

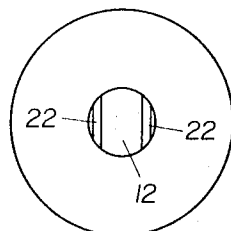


Fig. 6

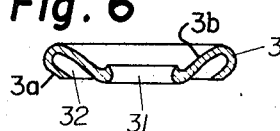


Fig. 7

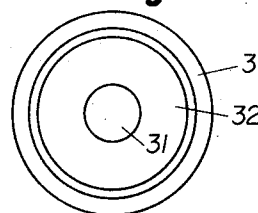


Fig. 8

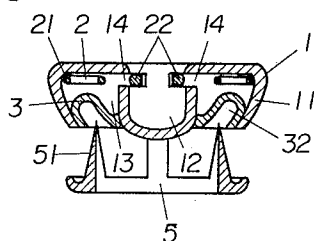
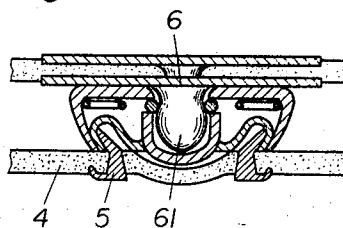


Fig. 9



SOCKET MEMBER OF SNAP FASTENER

The present invention relates to improvements in a socket member of a snap fastener.

Conventionally, the socket member of snap fasteners is provided with a stud head receiving element which comprises a plurality of fingerlike springs formed annularly at the center of the socket member. Further it is noted that in the case where a conventional snap fastener is used on clothes on which it is subjected to a great sidewise force, the fingerlike springs are pushed open outwardly beyond the limit of resilience, with the result that the stud member can not be engaged with the socket member in fitting contact therewith. In order to eliminate such difficulty, conventional socket members are provided with ribs projecting from the external surfaces of the fingerlike springs or from the inner end of an annular element surrounding the springs and spaced apart from the springs by a small distance. However, such socket members not only require complex stamping operation in forming fingerlike springs and projecting ribs but have disadvantages that it is difficult to effect engagement or disengagement between the stud head and the socket member smoothly and easily, since the stud head receiving element which is provided with fingerlike springs arranged in annular form causes excess frictional resistance to the stud head when it is engaged therewith or disengaged therefrom. Particularly when the cloth to which the snap fastener is attached is thin, flexible and weak, the portion of the cloth where the fastener is fixed is liable to be torn or broken, hence the snap fastener of conventional type is of poor practical value in such application.

A primary object of the present invention is to provide a socket member for a snap fastener which is adapted to engage or disengage a stud member with extreme ease and smoothness and which, when effecting engagement and disengagement, causes no breakage in the cloth at the portion where the snap fastener is attached even where the cloth is thin, flexible and weak.

Another object of the present invention is to provide a socket member for a snap fastener having neither fingerlike springs nor projecting ribs but comprising three elements which are simple in structure so as to make it possible to manufacture socket members by a simple operation for mass production which comprises a stamping step and an assembling step.

The socket member of a snap fastener in accordance with the present invention comprises a main body having a downwardly extending annular wall along its outer periphery, a recessed portion formed at the center thereof for receiving the head of a stud member and a space defined by the inner peripheral surface of the annular wall and the outer surface of the recessed portion, the its portion being provided at this base part with at least two slitlike cutouts in facing relationship with each other; a resilient bent wire formed of at least one spring wire so bent as to provide at least two straight portions; and a seating element provided at its center with an opening for receiving the projection of the main body formed by the recessed portion thereof and having an inclined annular groove surrounding the opening and extending upwardly outwardly, the resilient bent wire being disposed in the main body with the at least two straight portions thereof inserted into the cutouts of the recessed portion from outside so as to be spaced apart in parallel by a desired distance, the seating element being then fitted into the main body, the lower peripheral edge of the annular wall of the main body being thereafter calked inward.

When the head of a stud member is to be inserted into the recessed portion of the socket member, the at least two straight portions of the resilient wire disposed in parallel in the recessed portion are forced outward by the head and then returned to the original position upon the neck of the stud member being brought into engagement with the resilient wire so as to retain the stud in pressing contact with the socket member. As compared with the conventional stud head receiving portion comprising spring fingers employed to effect

clamping action, the use of a resilient wire as clamping element serves to substantially reduce the frictional resistance between the stud and socket member thereby insuring easy and smooth engagement and disengagement therebetween. Even where the cloth to which the snap fastener is secured is thin, flexible and weak, the portion of the cloth provided with the fastener can be prevented from breakage which will otherwise take place when the snap fastener is engaged or disengaged.

In addition, because the three constituent elements of the socket member, i.e. the main body, resilient bent wire and seating element are simpler in structure than the corresponding parts in conventional snap fasteners, the snap fastener of this invention can be manufactured easily by simple stamping and assembling operations for mass production.

For a better understanding of this invention, an embodiment will be described with reference to the accompanying drawings, in which:

FIG. 1 is a front view in vertical section showing a socket member of a snap fastener in accordance with the present invention;

FIG. 2 is a front view in vertical section showing only the main body of the socket member;

FIG. 3 is a plan view showing a resilient bent wire;

FIG. 4 is a bottom view showing the resilient bent wire as it is forced into the main body;

FIG. 5 is a top view of the same;

FIG. 6 is a front view in vertical section showing a seating element;

FIG. 7 is a bottom view of the same;

FIG. 8 is a front view in vertical section showing the socket member of this invention and an attaching member therefor; and

FIG. 9 is a front view partly in vertical section showing the head of a stud member in engagement with the socket member of this invention attached to a supporting sheet.

The socket member of a snap fastener of this invention comprises a main body 1 having the sectional shape shown in FIG. 2, a resilient bent wire 2 of the shape shown in plan view of FIG. 3, and a seating element having the sectional shape shown in FIG. 6.

The main body 1 has a downwardly extending annular wall 11 along its outer periphery, a recessed portion 12 formed at its center for receiving the head of a stud member, a space 13 defined by the inner peripheral surface of the annular wall 11 and the outer surface of the recessed portion 12 and adapted to receive the resilient bent wire 2 and the seating element 3, and at least two slitlike cutouts 14 formed at the base part of the recessed portion 12 in facing relationship with each other.

The resilient bent wire 2 is formed of a steel wire spring which is bent into a symmetrical form on the right and left. The resilient wire 2 comprises a curved portion 21 to be brought into pressing contact with the inner peripheral face of the annular wall 11 of the main body 1 and at least two straight portions 22 formed at the opposite ends of the wire spring and adapted to be inserted into the at least two cutouts 14 from outside.

Although not shown in the drawing, the resilient bent wire may alternatively be made of two wire springs each having a curved portion and a straight portion.

The seating element 3 is provided with an outer inwardly inclined wall 3a (FIG. 6) and an inwardly inclined wall 3b, defining an inclined annular groove 32 therebetween, and with a central portion for abutting against the recessed portion 12 for holding said seating element in spaced relation to said resilient bent wire means 2, as shown in FIGS. 1 and 8, said abutting portion in the form shown being provided by the edge of an opening 31 formed at its center for receiving the projection of the main body 1 defined by the recessed portion 12 with the inclined annular groove 32 surrounding the opening 31 and extending upwardly and outwardly within the aforesaid space 13.

3

The resilient bent wire 2 is forced into the space 13 in the main body 1 thus constructed, with the curved portion 21 held in pressing contact with the inner peripheral surface of the annular wall 11, the straight portions 22 being urged into the cutouts 14 from outside so as to be spaced apart in parallel by a desired distance. The seating element 3 is then fitted into the space 13 and the lower peripheral edge of the annular wall 11 of the main body 1 is calked inward so that said lower peripheral edge projects inwardly in underlying abutting relation to the perimeter of said outer inclined wall 3a for retaining the seating element 3 in abutting engagement with the recessed portion 12 as shown in FIGS. 1 and 8.

The socket member of the snap fastener thus constructed in accordance with the present invention may be attached to a supporting sheet 4 by placing the bottom of the socket member on the surface of the sheet 4 and pushing prongs 51 of an attaching member 5 into the inclined groove 32 of the seating element 3 from the rear face of the sheet 4 so as to clinch the same as shown in FIG. 8 and 9, said pronged attaching member having its prongs positioned to pass through the underlying sheet 4 and enter and be upset in the inclined annular groove 32 between the inclined inner and outer walls 3a and 3b of the seating element as shown. When the head 61 of a stud member 6 is to be fitted into the recessed portion 12 of the socket member fixed to the supporting sheet 4, the straight portions 22 of the resilient bent wire 2 are readily urged open toward the opposite sidewise directions so as to insure smooth and easy engagement.

It should be understood that the principal embodiment of this invention described above is given merely for the illustrative purposes and that the present invention is not limited only to this mode of embodiment. It will be possible for those skilled in the art to provide various modifications other than the foregoing, but such modifications may be included in the present invention insofar as they do not depart from the scope of the claims set forth below.

What is claimed is:

1 A socket member for a snap fastener, said socket member being of the type which comprises:

- a. a main body having
 1. a downwardly extending annular wall along its periphery,

4

2. a recessed portion formed at the center thereof for receiving the head of a stud member, and
3. a space defined by the inner peripheral surface of said annular wall and the outer surface of said recessed portion,
4. said recessed portion being provided at its base part with at least two slitlike cutouts in facing relationship with each other;
- b. resilient bent wire means having
 1. at least one curved part and
 2. at least two straight portions,
 3. said resilient bent wire means being disposed in said main body with said straight portions thereof resiliently pressed into said cutouts from outside so as to be spaced apart in parallel by a desired distance,
- c. a pronged attaching member for securing said socket member to a supporting sheet; and said socket member including the improvement which comprises:
- d. a seating element having
 1. an outer inwardly inclined wall,
 2. an inner inwardly inclined wall, and
 3. a central portion abutting against said recessed portion and holding said seating element in spaced relation to said cutouts,
 4. said inner and outer walls defining an inclined annular groove therebetween extending upwardly and outwardly within the aforesaid space,
- e. said annular wall having its lower peripheral edge projecting inwardly in underlying abutting relation to the perimeter of said outer inclined wall for holding said seating element in abutting engagement with said recessed portion, and
- f. said pronged attaching member having its prongs positioned to pass through the underlying sheet and enter and be upset in the inclined annular groove between the inclined inner and outer walls of said seating element.
2. A socket member as claimed in claim 1, in which the central portion of the seating element abutting said recessed portion is formed by the edge of a central opening in said seating element of less diameter than the outer diameter of said recessed portion.

* * * * *

45

50

55

60

65

70

75