United States Patent [19]

Furuya

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[54] **SNAP BUTTON**

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[73] Assignee: **Furuya Kogyo Kabushiki Gaisha,** Japan

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[30] **Foreign Application Priority Data**

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Nov. 16, 1973 Japan 48-129389

[52] **U.S. Cl.** ..... **24/208 A**
[51] **Int. Cl.**[2] **A44B 17/00**
[58] **Field of Search** ..... 24/90 E, 90 PR, 208 A, 24/213 R, 213 CS, 104, 107, 108, 216, 217

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Primary Examiner—Donald A. Griffin
Attorney, Agent, or Firm—Armstrong, Nikaido & Wegner

[57] **ABSTRACT**

Snap button is provided which comprises a male member, female member and tacking member. The male member comprises a base formed with uniformly spaced holes, a projection and a raised portion. The female member comprises a base formed with uniformly spaced holes, a receiving hole and a raised portion. The tacking member comprises spaced legs which engage the holes in the male member or female member.

15 Claims, 28 Drawing Figures

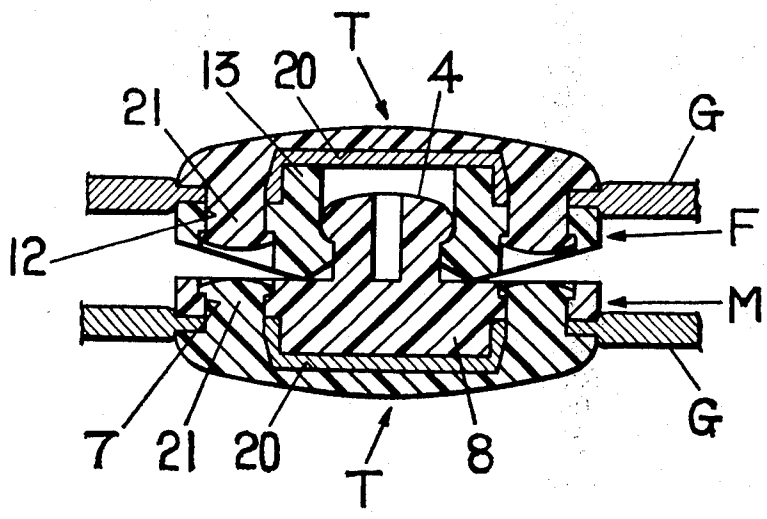


Fig. 1

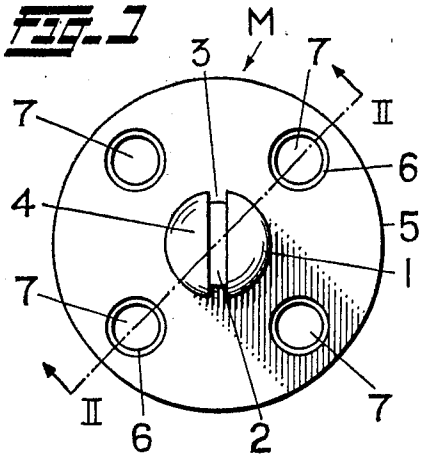


Fig. 4

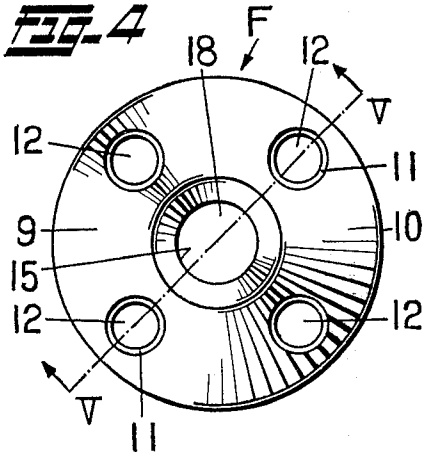


Fig. 2

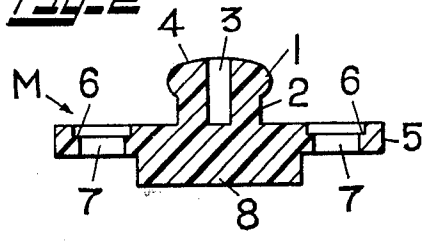


Fig. 5

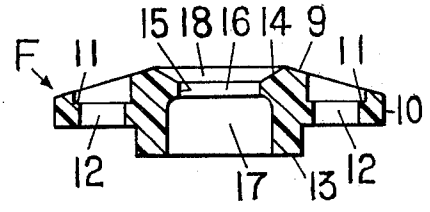


Fig. 3

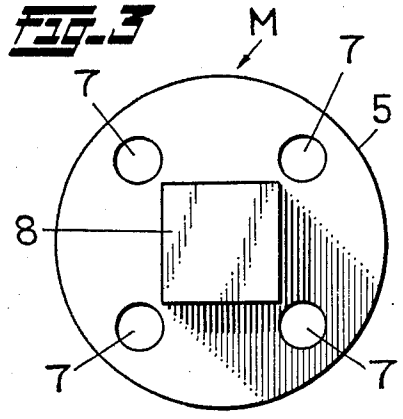


Fig. 6

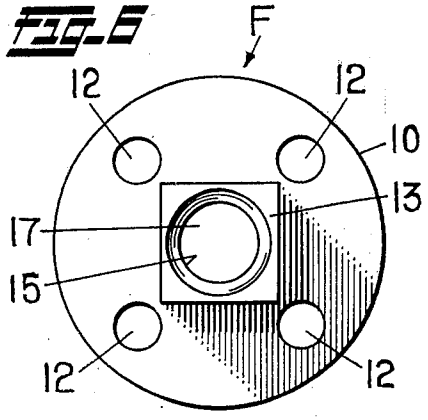


Fig. 7

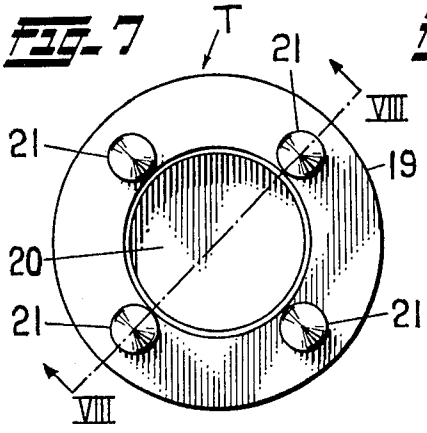


Fig. 8

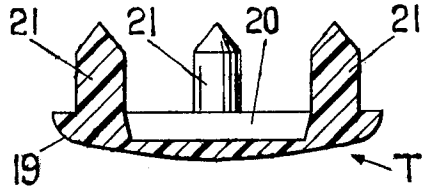


Fig. 9

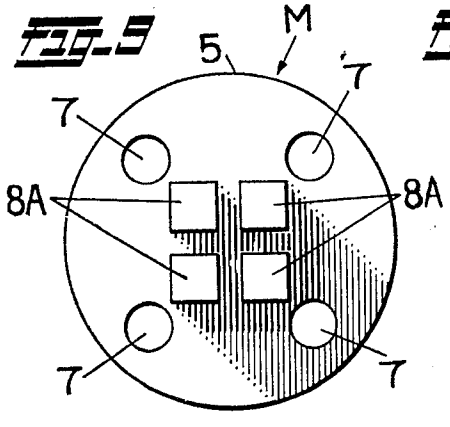


Fig. 10

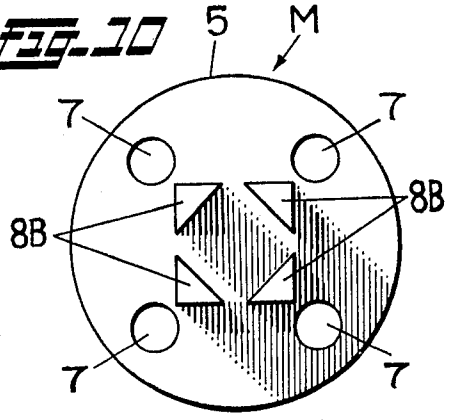


Fig. 11

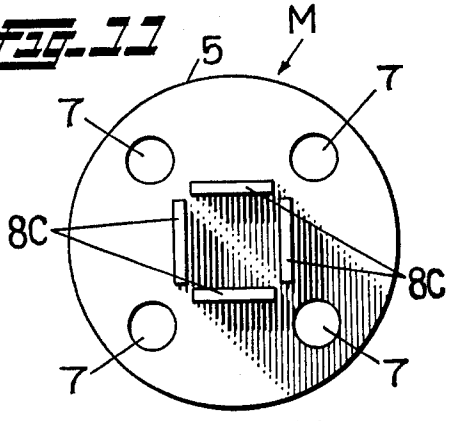


Fig. 12

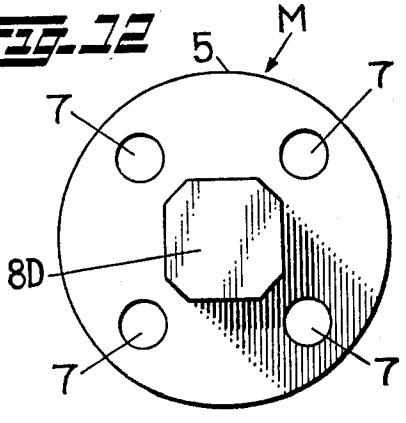


Fig. 13

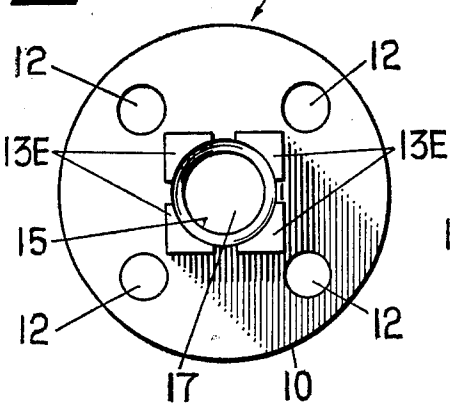


Fig. 14

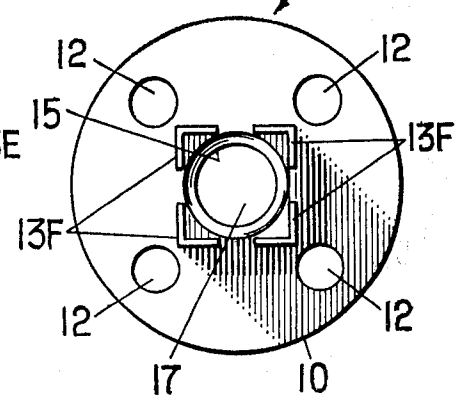


Fig. 15

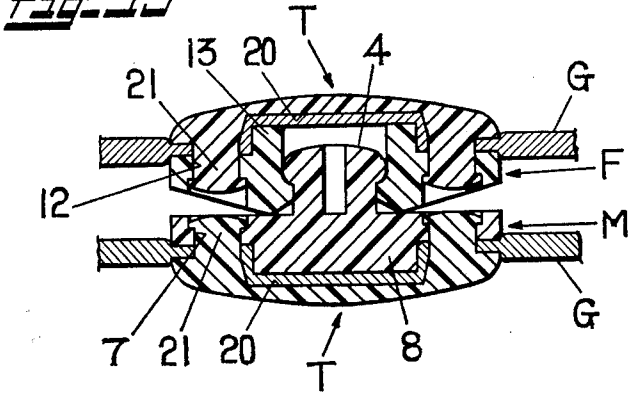


Fig_16

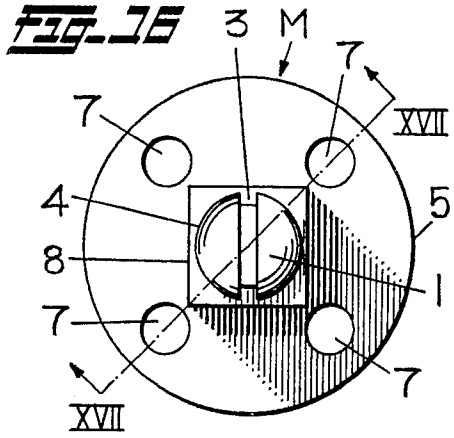


Fig_17

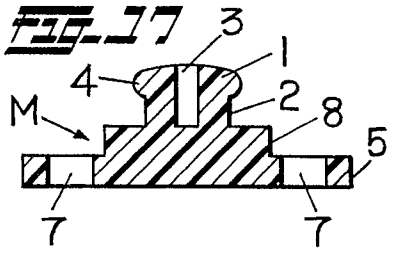


Fig_18

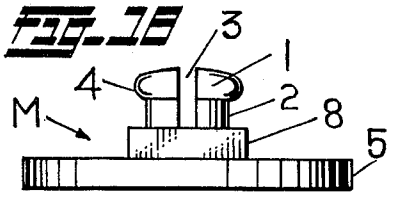


Fig_19

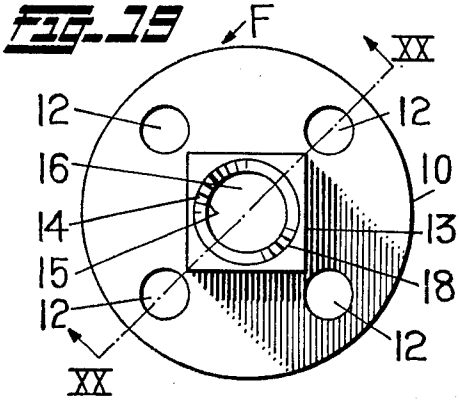


Fig_20

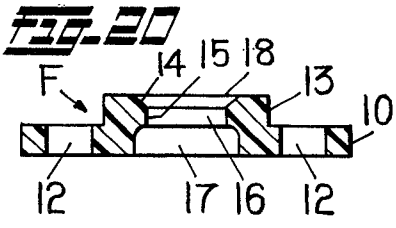


Fig_21

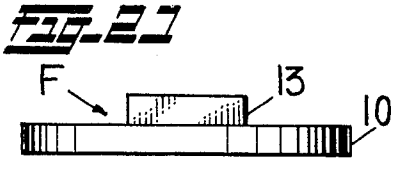


Fig_22

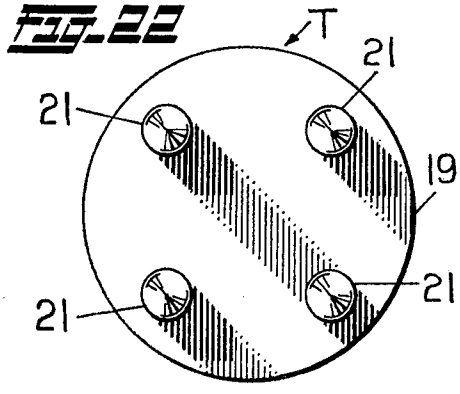


Fig_23

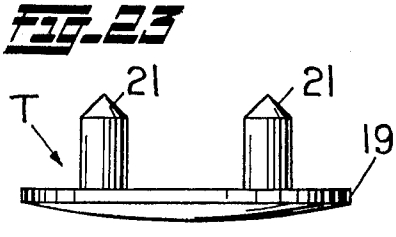


Fig. 24

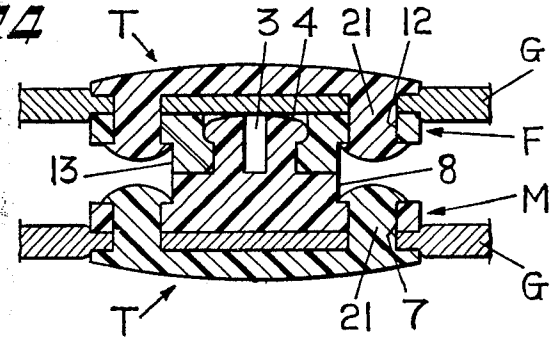


Fig. 25

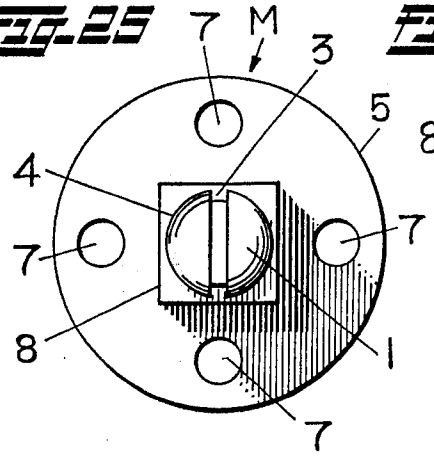


Fig. 27

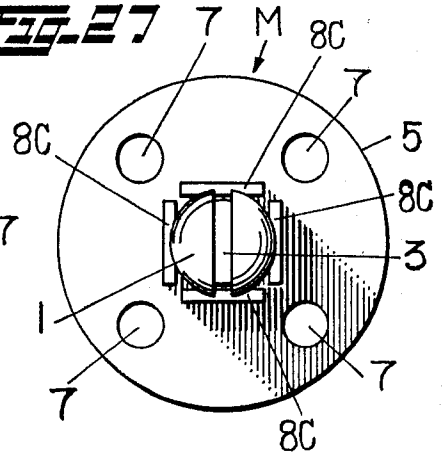


Fig. 26

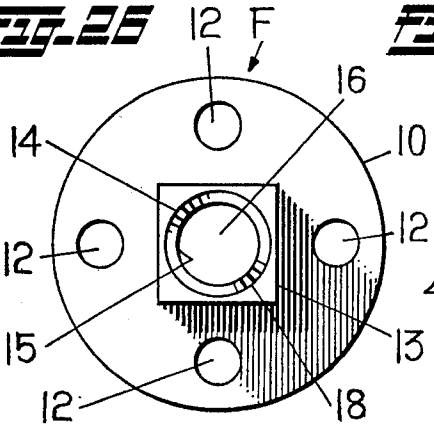
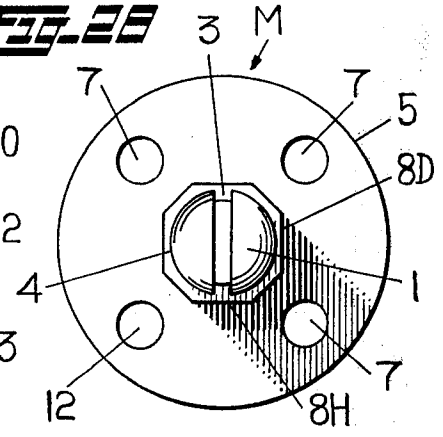


Fig. 28



SNAP BUTTON

BACKGROUND OF THE INVENTION

This invention is related to a snap button and more particularly to a snap button comprising a male member, female member and tacking member which can be easily and exactly aligned.

SUMMARY OF THE INVENTION

A snap button is provided which comprises a male member, female member and tacking member. The male member comprises a base formed with uniformly spaced holes positioned at equal distances from the center of the base, a projection and a raised portion which has a predetermined positional relationship with respect to the holes of the base. The raised portion is formed by one or more segments over the central area of the base and may be on the same side or opposite side of the base with respect to the projection. The female member comprises a base formed with uniformly spaced holes, a receiving hole and a raised portion which also has a predetermined relationship with respect to the holes. The raised portion of the female member includes one or more segments formed over the central area of the base. The tacking member comprises a uniformly spaced legs which engage the holes in either the male member or female member.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a male member of the present invention.

FIG. 2 is a sectional view taken along line II—II in FIG. 1.

FIG. 3 is a bottom view of the male member.

FIG. 4 is a plan view of a female member of the present invention.

FIG. 5 is a sectional view taken along line V—V in FIG. 4.

FIG. 6 is a bottom view of the female member.

FIG. 7 is a bottom view of a tacking member of the present invention.

FIG. 8 is a sectional view taken along line VIII—VIII in FIG. 7.

FIGS. 9 to 12 are bottom views showing other embodiments of the male member. FIGS. 13 and 14 are bottom views showing other embodiments of the female member. FIG. 15 is a sectional view showing the orientation of the male member, female member and tacking member in one embodiment of the invention with respect to article. FIG. 16 is a plan view of another embodiment of the male member of the present invention.

FIG. 17 is a sectional view taken along line XVII—XVII in FIG. 16.

FIG. 18 is a front view of the male member. FIG. 19 is a plan view of another embodiment of the female member of the present invention.

FIG. 20 is a sectional view taken along line XX—XX in FIG. 19.

FIG. 21 is a front view of the female member.

FIG. 22 is a bottom view of the tacking member.

FIG. 23 is a front view of the same.

FIG. 24 is a sectional view showing male member, female member and tacking member attached to the article.

FIG. 25 is a plan view of the male member of still another embodiment.

FIG. 26 is a plan view of the female member of a further embodiment.

FIGS. 27 and 28 are plan views of male members of still further embodiments.

DETAILED DESCIPTION OF THE PREFERRED EMBODIMENTS

This invention relates to a snap button, whose male member, female member and tacking member can be regulated to predetermined orientations to align holes of the male and female members to pointed legs of the tacking member.

An embodiment of snap button according to the invention consists of three parts, namely male member M, female member F and tacking member T.

The male member M has a structure as shown in FIGS. 1 to 3. It consists of a base 5 and a projection 4 extending from the front side center of the base. The projection consists of a head portion 1 formed with a groove 3 and a stem portion 2. The base 5 has uniformly spaced holes 7 each having a shoulder portion 6 at positions at an equal distance from its center. The base 5 also has on its back side a central square flat raised portion 8. The corners of the square raised portion are located on diagonal lines connecting the centers of diagonally opposite holes 7.

The female member F has a structure as shown in FIGS. 4 to 6. It consists of a base 10 having a tapered front surface 9. The base 10 has uniformly spaced holes 12 each having a shoulder portion 11 at positions at an equal distance from its center. The base is also formed with a projection receiving hole 18 consisting of an inwardly tapering front side guide opening 14 terminating in a reduced diameter opening 16 defined by an inner flange portion 15 and terminating in a recess 17 of an increased diameter. The base 10 also has on its back side a central square flat raised portion 13. The four corners of the square raised portion 13 are located on diagonal lines connecting the centers of diagonally opposite holes 12.

The tacking member T has a structure as shown in FIGS. 7 and 8. It consists of a base 19 formed on its back side with a central depression 20, and it has uniformly spaced pointed legs 21 extending from its back side at equal distances from its center. The legs 21 are adapted to be aligned with the holes 7 in the male member M and holes 12 in the female member F.

The male member M, female member F and tacking member T are each formed as a one-piece molding of a hard and tenacious synthetic resin.

The square raised portion 8 of the male member M, the square raised portion 13 of the female member F and four legs 21 of the tacking member T in this embodiment serve the function of restricting the orientation, which may be as described below.

The mechanism of the raised portion 8 or 13 serves to restrict the orientation of the male member M or female member F to a predetermined positional relation between holes 7 or 12 of the male or female member and the raised portion 8 or 13, which is formed on the back side central area of the base. The portions 8 or 13 may consist of either one or more segments.

For example as shown in FIG. 9, the raised portion comprises four flat square segments 8/A formed in a central area of the back side of the base 5 of the male member M. A square is formed by these adjacent square segments 8A and lines connecting the outer sides of these segments.

In another example shown in FIG. **10**, the raised portion comprises four uniformly spaced flat triangular segments **8B** formed in a central area of the back side of the base **5** of the male member M. These segments are each at an equal distance from the center of the base, and a square if formed by these adjacent triangular segments **8B** and lines connecting the outer sides of these segments.

In a further example shown in FIG. **11**, the raised portion comprises four elongated raised segments **8C** formed in a central area of the back side of the base **5** of the male member M. These segments are equal in thickness, width and length and at an equal distance from the center of the base, and a square is formed by the opposing pairs of segments **8C** and extension lines of the outer sides of these segments.

In a further example shown in FIG. **12**, the raised portion **8D** comprises an octagonal segment formed in a central area of the back side of the base **5** of the male member M, with opposing long sides being at an equal distance from the center of the base.

In a further example shown in FIG. **13**, the raised portion comprises four uniformly spaced, roughly triangular flat segments **13E**. These segments have an arcuate inner side and are formed in a central area of the back side of the base **10** of the female member F at an equal distance from the center of the base. A square is formed by these adjacent triangular segments **13E** and lines connecting the outer sides of these segments.

In a further example shown in FIG. **14**, the raised portion comprises four uniformly spaced L-shaped flat segments **13F** formed in a central area of the back side of the base **10** of the female member F, at an equal distance from the center of the base. A square is formed by outer sides of these adjacent L-shaped segments **13F** and lines connecting these segments.

It will be understood that irrespective of whether the raised portions **8** and **13** are formed on the bask side center of the base **5** of the male member M and the base **10** of the female member F they comprise a single segment or more than one segment. The opposing longitudinal or transverse outer sides of the raised portions are parallel, so that a square is defined either by the outer sides themselves, by outer sides and extension lines thereof or by outer sides and lines connecting thereof. In addition, the outer sides of the square are parallel with corresponding outer sides of a square defined by center-to-center lines connecting adjacent holes **7** or **12**, or the four corners of the square located on bisecting lines with respect to the opposing sides of a square defined by center-to-center lines connecting adjacent holes **7** or **12**.

In other words, the opposing longitudinal or transverse outer sides of the raised portion **8** or **13** are parallel to each other, and also the individual outer sides are in a predetermined positional relation to the holes **7** or **12**. Thus, the male member M or female member F may be moved along two included guide rails, with the raised portion **8** or **13** fitted between the rails. The position of the raised portion and holes are correctly regulated with respect to the direction of travel of the member by using the opposing outer sides of the raised portion. Also, by stopping the male member M or female member F with the orientation thereof correctly regulated, the holes **7** or **12** may be exactly aligned to the pointed legs **21** of the tacking member T for fitting the member M or F to the member T.

In the tacking member T, a square is also defined by lines tangential to the outer side of adjacent legs **21**, which are provided at an equal distance from the center of the base **19**. Thus, this member may also be moved along two inclined guide rails, by fitting these opposing two legs **21** between the rails, these opposing two legs **21** can be regulated parallel for slide. By stopping the member in the regulated position, the legs **21** can be stuck into the article G at correct positions.

Since the legs **21** struck at proper positions can be aligned to the corresponding holes **7** or **12** of the male member M or female member F in a proper orientation, according to the invention it is possible to fit the male member or female member to the tacking member without fail and hence without the possibility of producing any waste of parts.

Also, since according to the invention the opposing outer sides of the raised portions **8** or **13** are formed on the back side of the base, the raised portion **8** or **13** may be regulated in either longitudinal or transverse direction with respect to a recess of a predetermined width. In other words, there are two, namely longitudinal and transverse orientations that can be assumed by the male member M or female member F, so that it can be comparatively easily arranged in the regular orientation.

Further, although the raised portions **8** or **13** are raised from the back side of the male member M or the female member F in this invention, if the tacking member T with a depression **20** was used, the raised portion is received in the depression **20** of the base **19** of the tacking member, when the male member M or the female member F is fitted to the taking member T. Thus, it is possible to avoid such difficiency as an extra thickness that may otherwise result in the assembly of the male member M and female member F and tacking member T due to the raised portion **8** or **13**. Furthermore the article G may be firmly and reliably clamped between the male member M or female member F and tacking member T. The acticle G is clamped in a wavy form with the raised portion **5** of the male member M or raised portion **10** of the female member F and base **19** and depression **20** of the tacking member T.

Still further, since according to the invention the raised portions **8** or **13** formed on the back side of the base **5** or **10** of the member M or F, are flat and have a small thickness, there is no need of forming the article G with any particular hole for receiving the raised portion. Thus, it is possible to simplify the steps of attaching the male member or female member to the article. Yet further, the tacking member T can assume a definite position with respect to the article G by merely sticking a plurality of pointed legs **21**. Moreover, since the male member or female member can be attached to the article G without forming any hole therein, the male member or female member can be firmly and reliably attached to an article, even though it is made of a knit fabric or a like material which tends to readily lengthen and shorten so that the attached button will readily detach due to enlargement of a hole formed by cutting the woven yarn, or which is made of lace or a like material comprising readily displaceable fabrics.

In addition to the afore-mentioned various excellent effects, the construction of the button according to the invention is so simple that it can be easily manufactured and economically provided.

The embodiments shown in FIGS. **16–18** differ from those in FIGS. **1–16** primarily in that the raised portion

on the male and female members are on the base as the projection and opening respectively.

The male member M has a structure as shown in FIGS. 16 to 18. It consists of a base 5 with uniformly spaced holes 7 formed at positions at an equal distance from the center. A square low flat raised portion 8 having a central projection 4 in its center consisting of a head portion 1 formed with a groove 3 and a stem portion 2 is formed over the central area of the base 5. The corners of the square raised portion are located on diagonal lines connecting the centers of diagonally opposite holes 7, or, as shown in FIG. 25, the middle points of the outer sides of the square raised portion 8 are located on the diagonal lines.

The female member F has a structure as shown in FIGS. 19 to 21. It consists of a base 10 with uniformly spaced holes 12 formed at positions at an equal distance from the center. The base 10 is also formed over its central area with a low raised portion 13, and a receiving hole 18 consisting of an inwardly tapering guide opening 14 terminating in a reduced diameter opening 16 defined by an inner flange portion 15 and terminating in a recess 17 of an increased diameter. The four corners of the square raised portion 13 are located at positions on diagonal lines connecting the centers of diagonally opposite holes 12, or, as shown in FIG. 26, the middle points of the outer sides of the square raised portion 13 are located at positions on the diagonal lines.

The tacking member T has a structure as shown in FIGS. 22 and 23. It consists of a base 19 formed on its back side with uniformly spaced pointed legs 21 at an equal distance from the center. The legs 21 are adapted to be aligned to the holes 7 in the male member M or holes 12 in the female member F.

In accordance with the invention, the raised portion 8 and the projection 4 of the male member M are formed on one side of the base 5, the structure of the male member M may be further simplified without the need of providing a stepped portion in each hole 7. Also, since the female member F has the raised portion 13 raised from only one side of the base 10, the back thereof may be flat, so that the structure of the female member F may be further simplified without the need of providing any stepped portion in each hole 12. Further, the tacking member T to be used on the back side of the base 5 of the male member M or base 10 of the female member F may be of a simple structure with a flat inner side on the base 19. Thus, the male member M, female member F and tacking member T constituting the component parts of the snap button can be readily manufactured, and also the dies for these members may be manufactured comparatively inexpensively. The snap button according to the invention thus can be inexpensively produced.

According to the invention, the raised portion 8 of the male member M, raised portion 13 of the female member F and four opposing legs 21 of the tacking member T have the funtion of restricting the orientation of the male member M, female member F and tacking member T.

According to the invention, the longitudinal or transverse opposing outer sides of the raised portion 8 of the male member M or raised portion 13 of the female member F are parallel if the raised portion is square. In addition, the outer sides of the raised portion 8 or 13 are parallel with corresponding outer sides of a square defined by center-to-center lines connecting adjacent holes 7 or 12, or the four corners of the afore-mentioned square are located on bisecting lines with respect to the opposing sides of a square defined by center-to-center lines connecting adjacent holes 7 or 12. In other words, the holes 7 or 12 are in a predetermined positional relation to the outer sides of the raised portion 8 or 13, as above described.

Thus, the male member M or female member F may be moved along two inclined guide rails, with the raised portion 8 or 13 fitted between the rails. The orientation of the holes 7 and 12 is correctly regulated with respect to the direction of travel of the male member M or female member F by opposing outer sides of the raised portion. Also, by stopping the male member M or female member F with the orientation thereof correctly regulated, the holes 7 or 12 may be correctly aligned with the pointed legs 21 of the tacking member T for fitting the member M or F to the tacking member T. Thus, the male button or the female button is provided.

Since the tacking member T has pointed legs uniformly spaced at an equal distance from the center of the base 19. The tacking member T may also be moved along two inclined guide rails, with the two leading legs 21 and two trailing legs 21 in slidable engagement with the rails. Also, by stopping the tacking member T in the correctly orientated state the legs 21 may be set in article G at correct positions.

Since the legs 21 set at proper positions in the article G can be aligned to the corresponding holes 7 or 12 of the male member M or female member F in a proper orientation, according to the invention it is possible to fit the male member or female member to the tacking member without fail and hence without the possibility of producing any waste part.

The necessity and importance of the ability of moving the male member M, female member F and tacking member T with the orientation of the holes 7, holes 13 and pointed legs 21 correctly regulated will be readily understood from the fact that male and female members of the snap button of this type must be fitted to the article continuously, mechanically and exactly.

According to the invention, the opposing outer sides of the raised portion 8 or 13 of the male member M or female member F are parallel to each other and at an equal distance from the center, so that the raised portion 8 or 13 may be regulated in either the longitudinal or transverse orientation by fitting it between rails spaced apart a predetermined gap. In other words, there are two chances for arrangement, namely the longitudinal and transverse orientations that can be assumed by the male member M or female member F, so that the correct regulation of the orientation is comparatively easy.

Also, according to the invention since the position of the tacking member T may be determined by merely setting the pointed legs 21 in the article G, it is possible to attach the male member M or female member F and tacking member T together without the need of forming any particular hole in the article G. Further, since the male member M or female member F can be attached to the article G without forming any holes therin, these members can be firmly and reliably attached to an article, even though it is made of a knit fabric or like material tending to readily lengthen or shorten so that the attached button will readily detach due to enlargement of a hole formed by cutting the woven yarn. Also, the member can be attached to a

fabric which is made of a lace or like material consisting of readily displaceable fabrics.

While in the above embodiment the male member M or female member F is formed with a square raised portion **8** or **13**, the raised portion **8** or **13** need not be square in shape. The shape may be freely selected so far as the raised portion has a predetermined positional relation to the holes **7** or **12** of the male member or female member and has the function of restricting the orientation of the member in either the longitudinal or transverse direction. For example, an arrangement shown in FIG. **27**, with four elongate segments **8C** in two pairs of parallel segments of equal thickness, width and length which are at an equal distance from the center. Another arrangement is shown in FIG. **28**, with a flat octagonal raised portion **8H** with opposing long sides **8D** at an equal distance from the center.

What is claimed is:

1. A snap button comprising a male member and a tacking member, said male member comprising a base formed with uniformly space holes positioned at equal distances from the center of said base, a projection, and a raised portion having a polygonal cross section, the polygon having a predetermined positional relationship with respect to said holes, said raised portion including at least one segment formed over a central area of said base, said raised portion serving to restrict the orientation of the male member, said tacking member having uniformly spaced pointed legs at equal distances from the center of the member and adapted to be aligned to said holes.

2. The snap button of claim **1** wherein said male member and tacking member are each a one piece molded synthetic resin.

3. The snap button of claim **1** wherein the raised portion of said male member is on the opposite side of the base as the projection.

4. The snap button of claim **1** wherein the raised portion of said male member is on the same side of the base as the projection

5. The snap button of claim **1** wherein said tacking member includes a central depression formed therein.

6. A snap button comprising a female member and a tacking member, said female member comprising a base formed with uniformly spaced holes located at positions at equal distances from the center of said base, a receiving hole and a raised portion having a polygonal cross section, the polygon having a predetermined positional relationship with respect to said holes, said raised portion including at least one segment formed over a central area of said base, said raised portion serving to restrict the orientation of the female member, said tacking member having uniformly spaced pointed legs at equal distances from the center of the member and adapted to be aligned to said holes.

7. The snap button of claim **6** wherein said female member and tacking member are each a one piece molded synthetic resin.

8. The snap button of claim **6** wherein the raised portion of said female member is on the opposite side of the base as the receiving hole.

9. The snap button of claim **6** wherein the raised portion of said female member is on the same side of the base as the receiving hole.

10. The snap button of claim **6** wherein said tacking member includes a central depression formed therein.

11. A snap button comprising a male member, a female member and two tacking members, said male member comprising a base formed with uniformly spaced holes positioned at equal distances from the center of said base, a projection and a raised portion having a polygonal cross section, the polygon having a predetermined positional relationship with respect to said holes, said raised portion including at least one segment formed over a central area of said base, said raised portion serving to restrict the orientation of the male member, said female member comprising a base formed with uniformly spaced holes located at positions at equal distances from the center of said base, a receiving hole and a raised portion having a polygonal cross section, the polygon having a predetermined positional relationship with respect to said holes, said raised portion including at least one segment formed over a central area of said base, said raised portion serving to restrict the orientation of the female member and each said tacking member comprising uniformly spaced pointed legs at an equal distance from the center of the member, said legs adapted to be aligned to said holes of the male member or said holes of the female member.

12. The snap button of claim **11** wherein said tacking member has a central depression.

13. The snap button of claim **11** wherein said male member, female member and tacking member are each a one piece molded synthetic resin.

14. The snap button of claim **11** wherein the raised portion of said male member is on the opposite side of the base as the projection and the raised portion of the female member is on the opposite side of the base as the receiving hole.

15. The snap button of claim **11** wherein the raised portion of said male member is on the same side of the base as the projection and the raised portion of the female member is on the same side of the base as the receiving hole.

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