United States Patent

Kahn

[15] **3,691,597**

[45] **Sept. 19, 1972**

[54] **TWO-PART SNAP-ON FASTENING DEVICE**

[72] Inventor: **Edward J. Kahn,** Baltimore, Md.

[73] Assignee: **Togs, Inc.,** Cockeysville, Md.

[22] Filed: **July 27, 1971**

[21] Appl. No.: **166,616**

Related U.S. Application Data

[63] Continuation of Ser. No. 819,144, April 25, 1969, abandoned, which is a continuation-in-part of Ser. No. 781,296, Oct. 16, 1968, abandoned.

[52] **U.S. Cl.**.....**24/108,** 24/109, 24/113 MP

[51] **Int. Cl.**.....**A44b 1/38**

[58] **Field of Search**...24/90 RP, 90 F, 104, 106, 107, 24/108, 102 SL, 113 MP, 208.3, 213, 214

[56] **References Cited**

UNITED STATES PATENTS

1,383,591	7/1921	Angle	24/90
1,410,916	3/1922	Hendrix	24/90
1,974,499	9/1934	Luce	24/208.3 UX
2,379,529	7/1945	Kennedy	24/208.3 UX
2,715,253	8/1955	Martin	24/108
2,838,820	6/1958	Hakanson	24/216

FOREIGN PATENTS OR APPLICATIONS

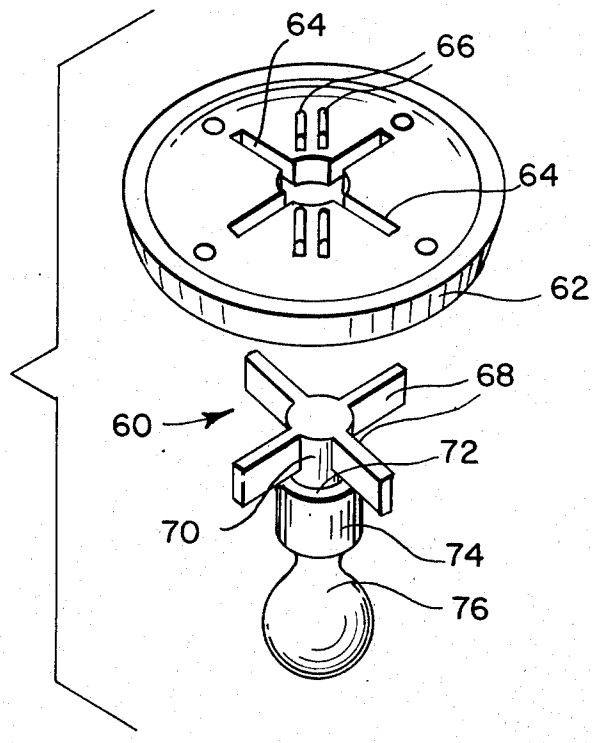
630,145	11/1927	France	24/108
6,601,558	2/1966	Netherlands	24/208.3

Primary Examiner—Werner H. Schroeder
Attorney—Kenneth E. Prince

[57] **ABSTRACT**

The invention disclosed is for a two-part snap-on fastening device which includes a button member having a stud projecting therefrom, and a foundation member securable to a garment. The projecting stud mates with the foundation member in a semi-permanent fashion so that disengagement does not result during normal wearing conditions. In a preferred embodiment, the button portion is made of relatively hard material having a stud integral therewith, the free end of which is bulbous and adapted to be inserted into the somewhat resilient foundation member and form a semi-permanent connection therewith.

7 Claims, 13 Drawing Figures



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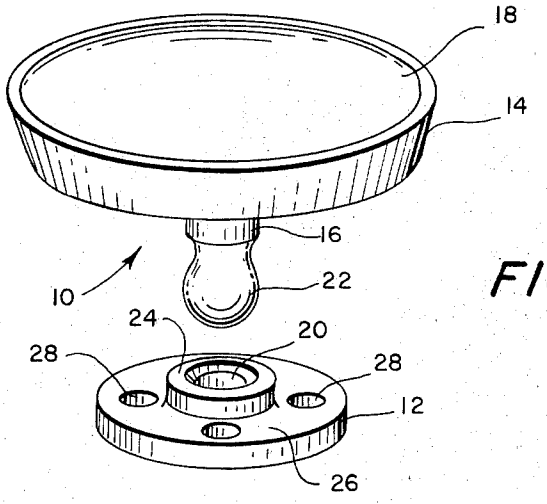
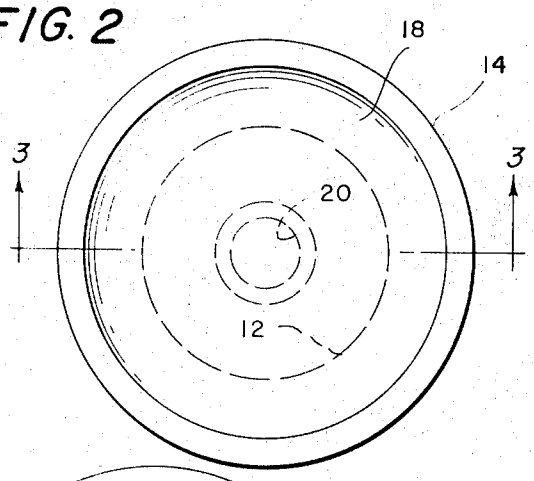


FIG. 1

FIG. 2



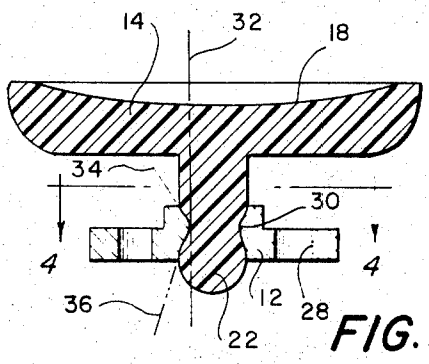


FIG. 3

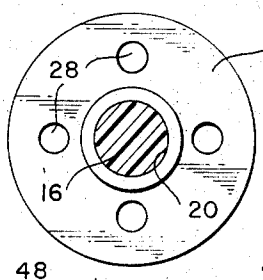


FIG. 4

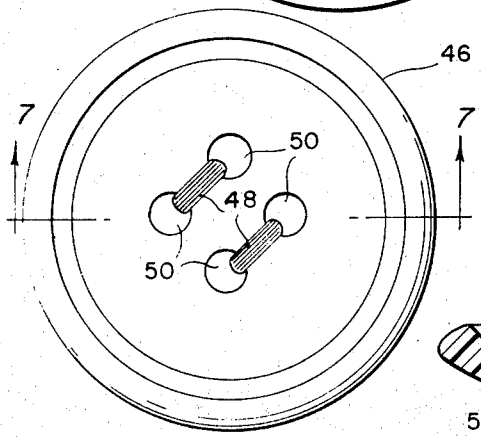


FIG. 6

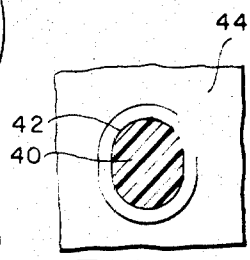


FIG. 5

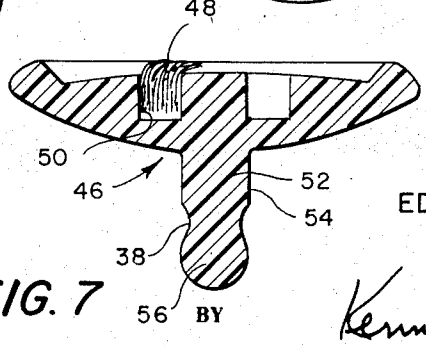


FIG. 7

INVENTOR
EDWARD J. KAHN

BY

Kenneth E. Prince

ATTORNEY

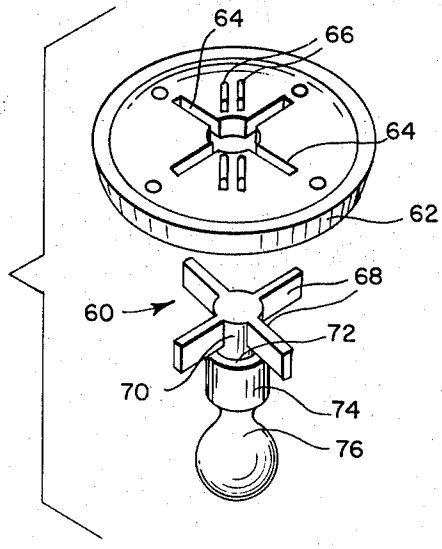


FIG. 8

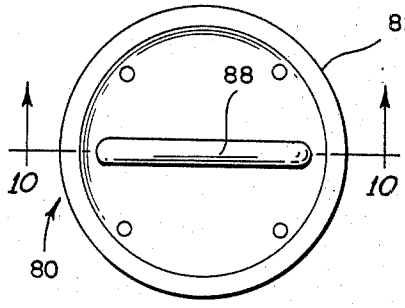


FIG. 10

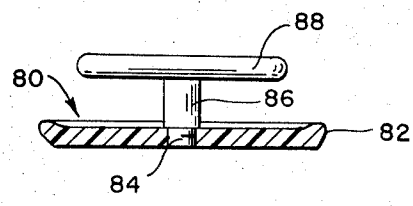


FIG. 11

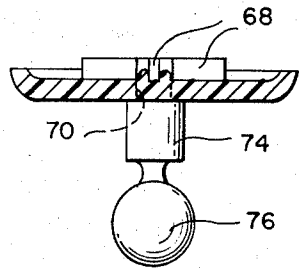


FIG. 9

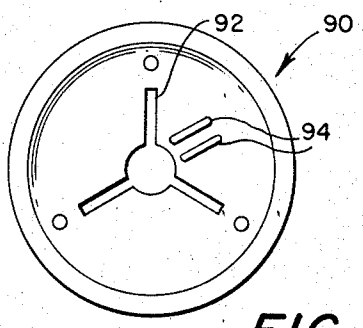


FIG. 12

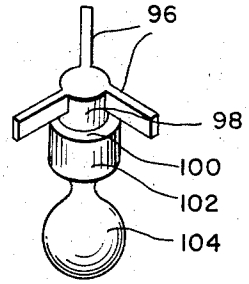


FIG. 13

INVENTOR
EDWARD J. KAHN

BY Kenneth E. Prince
ATTORNEY

TWO-PART SNAP-ON FASTENING DEVICE

This application for U.S. Letters Patent is a continuation application of serial No. 819,144, filed April 25, 1969, now abandoned, which is a continuation-in-part application of serial No. 781,296, filed Oct. 16, 1968, and now abandoned.

The present invention relates to a two-part snap-on fastening device which includes a button (male) member having a stud projecting therefrom and adapted to mate with a foundation (female) member secured to a garment without disengagement resulting during normal wearing conditions.

Conventionally in tailoring a garment, two basic button sewing operations are involved which require both a reasonably simple and a reasonably complex sewing machine. One sewing machine is required for decorative buttons which contribute to the display, fashion or aesthetic appeal of the garment. These buttons, as a rule, are sewed flat against the surface of a garment by using a reasonably simple sewing machine. A second sewing operation is generally required for functional buttons because of the "neck" which holds the button away from the garment to permit easy fastening without undue wear on the button-hole. Special machines are employed for sewing on buttons requiring a neck and conventionally are relatively slow operating. Also, such buttons easily become loosened during use and must be frequently re-sewed. This neck is necessary to avoid the appearance of a taut button, which would otherwise appear if the button is firmly sewed against the surface of a garment.

The mechanical sewing operation for functional buttons having a neck requires the use of a special sewing machine because the more commonly available button sewing machines will not form a neck. These special sewing machines are not only expensive to construct and operate, but also are relatively slow in operation as compared to that of the more commonly available sewing machines. Because of the general unavailability of these special sewing machines, it is necessary that dislodged buttons having the described neck be replaced by hand which is tedious and time consuming.

Attempts have been made heretofore to simplify the sewing of buttons to a garment by avoiding or replacing the expensive initial sewing operation for buttons by means which may also avoid the difficulties in reattaching dislodged buttons. To date, these attempts have included the use of hooks, snaps or slide fasteners, none of which has been adequate for all purposes.

Numerous variations of separable fastening devices including buttoning elements are known to the art. Typically, in the more simple form, these devices include retaining elements which easily become separated in use even with moderate pull under normal wearing conditions. On the other hand, the more permanently attachable variety of separable fastening devices typically include complex elements forming intricate clamping members which impair the appearance and display of the device while being economically impracticable for industrial use. None of the variations of separable buttons known to the art have presented a simple and effective device with separable fastening features without impairing the appearance or display of the mounted button.

In accordance with the present invention, there is provided a two-part snap-on fastening device which includes features of construction and combination of elements which overcome, in a practical and simple manner, many of the defects inherent in separable fastening devices known to the art heretofore. The present two-part snap-on fastening device is versatile in use, simple in construction and readily adaptable to conventional machinery and methods of application to a garment. The two-part snap-on fastening device of the present invention also provides a more economical approach to problems encountered in conventionally securing and replacing buttons on a garment by not requiring use of special sewing machines for the functional buttons. It also avoids duplication of button sewing stations for both decorative and functional buttons.

Generally stated, the present invention provides a two-part snap-on fastening device which includes a foundation member having means for attachment to a garment and in a preferred embodiment, the foundation member is flat and is adapted to be sewn to the garment by conventional means. This foundation or female member defines a central opening and includes an integral inwardly extending, continuous flange about the inner surface defining the opening. The flange has a cross-section defined by an upper tapering surface and a lower tapering surface joined to an apex to form a continuous fulcrum for snap-action reception of bulbous end of the stud receivable thereby. The angle of taper from the apex tangent line may be 30°–40 for the upper surface and 20°–30° for the lower surface. These tapering surfaces insure a tighter fit between the two members. The button member of the present fastening device is provided with an integral stud projecting from its base. The stud has a continuous circumferential groove disposed about its surface near its free end with corresponding surfaces for mating contact with the flange. This combination of elements provides a fastening device having a button member which may be readily snap-fitted into the opening of the foundation member when the latter is secured to a garment without disengagement of the button member resulting under normal wearing conditions. In one embodiment, the present fastening device includes a stud of a length at least that of the thickness of a garment to be supported thereby. Additional embodiments of this device will appear in the description which follows.

Other equivalent mating configurations are fully within the scope of the present invention. For example, a threaded convection may be used; the female member may have radial slits adapted to receive vanes projecting outwardly from the side of the stud adjacent the end with a circumferential groove adapted to receive the inner peripheral edge of the central opening of the foundation member. By means of bosses or indentations on the back side of the foundation member adjacent the opening, rotation of the male member will lock the components against easy dislodgment.

The present invention will become more apparent from the following detailed description taken in connection with the accompanying drawing wherein:

FIG. 1 is a perspective view of a two-part snap-on fastening device embodying the present invention;

FIG. 2 is a top elevational view of the fastening device of FIG. 1;

FIG. 3 is a half sectional view taken along section lines 3—3 of FIG. 2 illustrating a fulcrum for snap-action reception of a male member disposed from the button member;

FIG. 4 is a sectional view taken along section lines 4—4 of FIG. 3 illustrating a foundation member as a generally disc-shaped member which is securable to a garment;

FIG. 5 is a cross section of the neck portion of a non-round stud which is entirely within the scope of the present invention;

FIG. 6 illustrates an ornamental button surface having simulated threads disposed between blind holes; and

FIG. 7 is a half sectional view taken along section lines 7—7 of FIG. 6;

FIG. 8 is a top view of the female member showing an alternate locking means;

FIG. 9 is a side elevation, partly in section, showing another embodiment of the present invention;

FIGS. 10 and 11 are top and partly sectional side views of another embodiment having a threaded locking mechanism;

FIG. 12 is a bottom view of the female member for a mating system having radial slits;

FIG. 13 is a side view of the male member constructed to mate with the female member of FIG. 12.

In the drawings wherein similar elements are referred to by similar numerals throughout the several views, FIG. 1 illustrates two-part snap-on fastening device 10 having foundation member 12 illustrated generally as a disc-shaped element, and button member 14 which includes integral stud 16 projecting substantially perpendicular from the central area of the bottom surface thereof. Button 14 may include an ornamental surface 18 as desired.

Foundation member 12 includes central section 20 defining an opening and including elements for receiving and retaining a portion of stud 16. When stud 16 includes an enlarged and generally rounded free end 22, the entrance of central section 20 is slightly larger than the rounded free end 22 to permit entry into the opening. Central section 20 may include crowned portion 24 to facilitate reception of the stud of the button member. About central section 20 may be disposed as an integral part thereof, a generally thin foundation plate 26 illustrated as a disc-shaped base with orbital perforations 28 providing means for attachment of the foundation member by sewing to a garment. Although the foundation member may be attached to a garment by any suitable and known means including staples, clamps, and the like, for reasons of simplicity, it is usually desirable that the foundation member be attached to a garment by sewing in which instance the orbital perforations are included disposed symmetrically for sewing by machine.

Foundation member 12 may be attached intermediate two layers of a garment, or on either an upper or lower surface of a garment as may be desired. Conveniently, foundation member 12 is attached by sewing to the upper or exposed surface of a garment which eliminates the necessity to perforate the garment for reception of the stud of the button member when the foundation member is otherwise fastened to the garment.

FIG. 2 illustrates the relative positioning of elements of fastening device 10 when button member 14 is snap-fitted to foundation member 12. FIG. 3 more clearly illustrates this relative association of elements in half-section.

FIG. 3 illustrates in greater detail the formation of continuous flange 30 as an integral component of foundation member 12 within central opening 20 thereof for snap-action reception and retention of a portion of stud 16. In this embodiment continuous flange 30 has a cross-section defined by an upper tapering surface and a lower tapering surface joined to an apex to form a continuous fulcrum for snap-action reception of a portion of the stud receivable thereby. In this embodiment, the upper tapering surface is disposed at a greater angle from apex tangent line 32 than is the lower tapering surface. It is found that this difference in surface taper forming continuous flange 30 readily permits the snap-fitting of a portion of stud 16 with retention thereof without disengagement resulting under normal wearing conditions when the foundation member is secured to a garment. The numerical values of these angles are not critical although it is desired that the mating members form a snug fit to avoid appearance of looseness. This will usually dictate that the taper of the lower surface be less than the taper of the upper surface relative to apex tangent line 32.

Near the free end of stud 16 projecting from button member 14 there appears continuous groove 38, more clearly illustrated in FIG. 7, disposed about its surface. In this embodiment, the continuous groove is formed with tapering surfaces for mating contact with continuous flange 30. It is recognized that although the continuous flange and mating groove are defined by tapering surfaces relative to an apex tangent line, these surfaces may be flat or slightly arcuate as desired. For convenience in molding the respective parts, slightly arcuate surfaces are preferred.

FIG. 4 illustrates the cross-sectional configuration of stud 16 appearing circular and positioned within correspondingly shaped central opening 20 of foundation member 12 whereas FIG. 5 illustrates an embodiment having stud 40 ovate in cross-sectional within correspondingly shaped central opening 42 of foundation member 44. It is within the scope of this invention to have the neck of any cross-sectional configuration as long as the two members form a proper mating.

FIG. 6 illustrates an embodiment wherein button member 46 has an ornamental surface which includes simulated or actual threads 48 disposed between blind holes 50. Display of button member 46 on a garment effectively conveys an impression of a conventional button. The ornamentation displayed on the button member may vary as desired to suit personal preferences, styles or vogue.

FIG. 7 further illustrates in half-section the embodiment button member 46 of FIG. 6, and further presents features for stud 52 which features may also be present on stud 16. Stud 52 desirably includes a length 54 intermediate the bottom surface of the button and groove 38. Length 54 of stud 52 may vary as desired but conveniently is of a length at least that of the thickness of a garment to be buttoned thereby. This length provides the required neck heretofore formed by an expensive thread wrapping operation about button to garment supporting thread.

Stud **52** may include an enlarged and generally rounded free end **56** which is insertable into the opening of a foundation member. In order to receive and retain the rounded free end **56** of the stud, some slight dilating results to permit entry and contraction by the continuous flange of the foundation member. Return of the members to normal position prevents disengagement of the members during normal wearing conditions.

The present fastening device may be simply applied to a garment and thus serves as a convenient and inexpensive substitute for conventional buttons. The foundation member may be attached to the surface of a garment by a simple sewing operation and the button member may then be snap-fitted into position. The length of the stud determines the length of the neck.

It is obvious that practice of the present invention may be applied, in the manner described, to any of a variety of fastening devices of the separable type such as cuff studs, collar studs, emblem buttons and the like which are generally designed for temporary attachment as opposed to permanent attachment of the respective members forming the device.

The present fastening device also permits the mounting or interchanging of a variety of ornamental buttons to a garment attached member without impairing its appearance and display.

It will be apparent to persons skilled in the art that the present fastening device satisfies a long felt want for an efficient and practical approach for fastening garments. It will be also apparent from the foregoing that the present fastening device provides great versatility, great efficiency in mounting of the detachable elements, and simplicity of construction affording use in conventional methods and machinery without any degree of modification.

The present fastening device provides a two-part construction, each desirably integral or of one piece construction and with limited resiliency which is, in part, a feature of the substance forming the product. For convenience and economy, the basic elements of the button other than the ornamental display, and that of the generally disc-shaped member may be each cast or molded as an integral or one-piece unit.

The various elements of the present device, unless otherwise indicated, may be formed of any suitable material including metals, plastics and the like provided the mating parts permit proper union while preventing disengagement under normal wearing conditions. Desirably, at least the stud member of the button portion and the generally disc-shaped member includes, as a polymer a copolymer or mixture of polymers, materials such as polyethylene, polypropylene, isotactic poly-l-butene, acrylonitrile-butadiene-styrene, polystyrene, poly (vinyl chloride) and the like. The plastic materials are selected primarily with respect to resiliency and other tensile properties for manufacturing a fastening device which is durable, attractive and economically produced. If desired, the material may be colored or otherwise decorated to present a colorful display which blends with the garment to which it is to be attached. It is also possible that the generally disc-shaped member may be colored to camouflage its presence against the surface of a garment while the button member may be colored for fashion appeal.

Although one embodiment of the present invention has been illustrated herein, it is to be understood that various changes and modifications may be made in the construction and arrangement of elements without departing from the spirit and scope of the invention as defined.

While we have shown a single locking configuration, it is possible to have multiple grooves and/or flanges to give added security.

Other embodiments are shown in FIGS. **8–13**. In the embodiment shown in FIG. **8**, the central opening in female member **62** is provided with radial slits **64** adapted to receive vanes **68** which extend outwardly from the bottom part **70** of male member **76**. Concentric with part **70** is a portion **74** of increased cross section which provides a shoulder **72**, which, with vanes **68**, hold the parts in fixed position. Rotation of male member in the opening causes vanes **68** to move to a position between paired ridges **66**, which lock the parts together. FIG. **9** shows the parts in locked position.

FIGS. **10** and **11** show the members locked together by a threaded connection as at **84**.

FIGS. **12** and **13** show an embodiment similar to that of FIGS. **8** and **9** but having three vanes and a single pair of locking ridges.

Other equivalent locking means and button configurations are within the scope of this invention. Also the outer part of the male member may be covered with any material selected by the user, or formed into any shape or color.

I claim:

1. A two-part snap-on fastening device which comprises in combination, a relatively resilient foundation member having means for attachment to a garment and a central section defining an opening with radial openings, and a button member of relatively hard material having an integral stud projection from its base, said stud having a continuous groove disposed about its surface near its free end with corresponding surfaces for mating contact with said opening of the foundation member, and vanes projecting from said stud at the free end and to the continuous groove, said vanes received by the radial openings such that the button member may be readily snap-fitted into said opening of the foundation member and secured by rotation by the mating surfaces without disengagement resulting under normal wearing conditions.

2. The two-part snap-on fastening device of claim **1** wherein a plurality of orbital perforations are disposed about the disc portion for attachment to the surface of a garment by sewing.

3. The two-part snap-on fastening device of claim **1** wherein said stud and foundation member are formed of plastic.

4. The two-part snap-on fastening device of claim **1** wherein the button surface is ornamental and includes simulated threads between blind holes.

5. The two-part snap-on fastening device of claim **1** wherein four vanes are projected from said stud.

6. The two-part snap-on fastening device of claim **1** wherein three vanes are projected from said stud.

7. The two-part snap-on fastening device of claim **1** wherein paired ridges receive at least one vane in locked position.

* * * * *