Oct. 31, 1967 MINORU MAENO 3,349,451

PLASTIC GRIPPER BUTTON

Original Filed Feb. 25, 1964 3 Sheets-Sheet 1

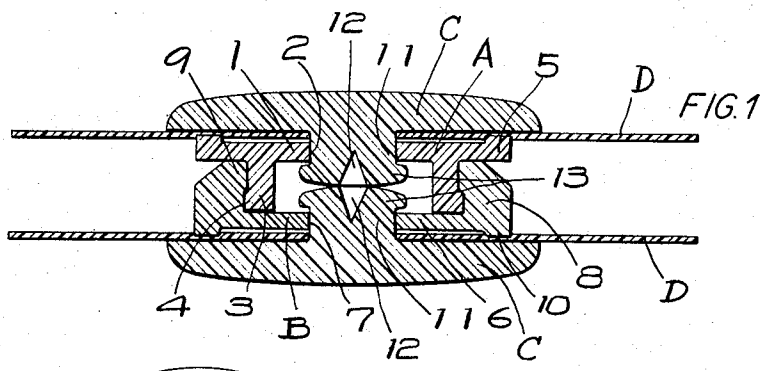


FIG. 1

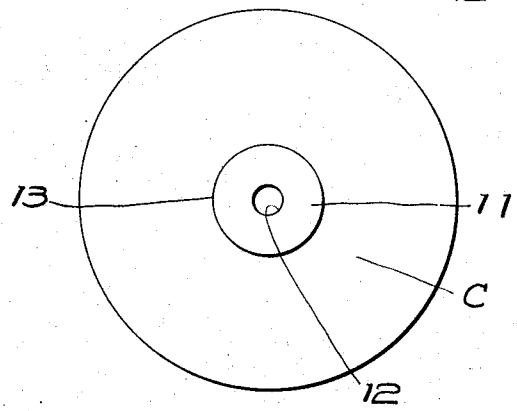
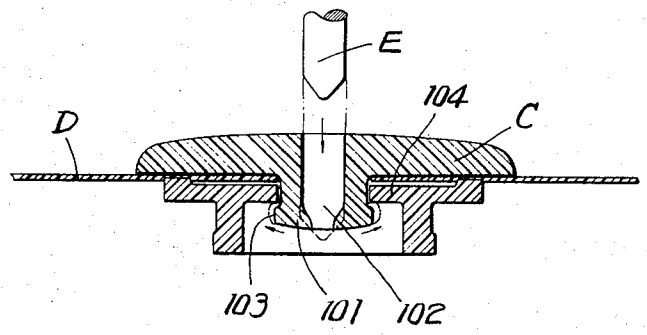


FIG. 2

FIG. 9



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Fig. 3

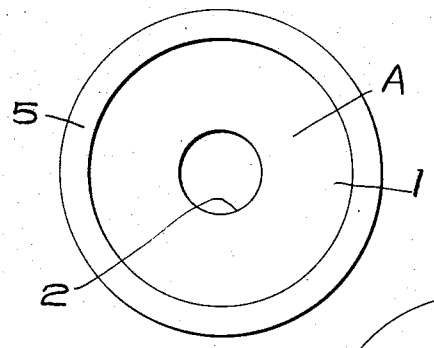


FIG. 4

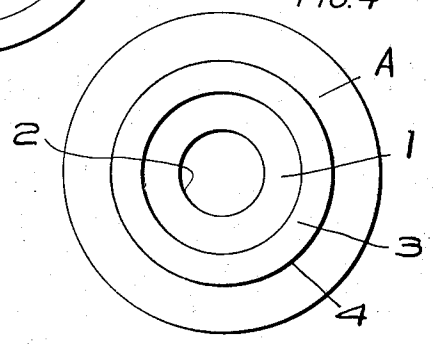
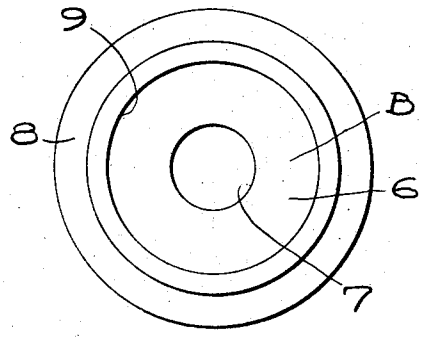


FIG. 5



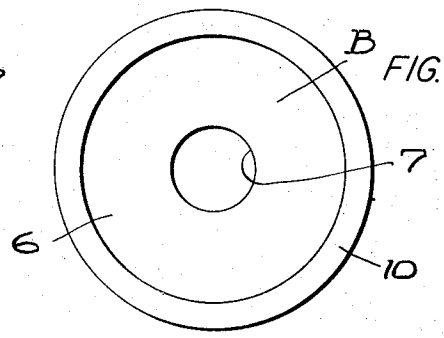


FIG. 6

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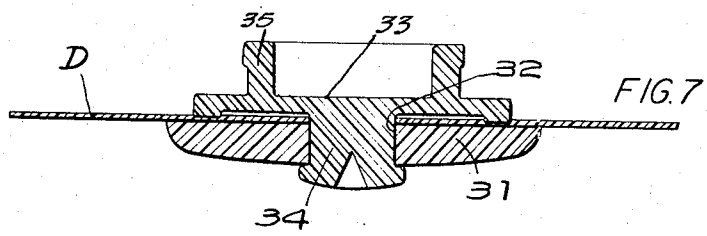
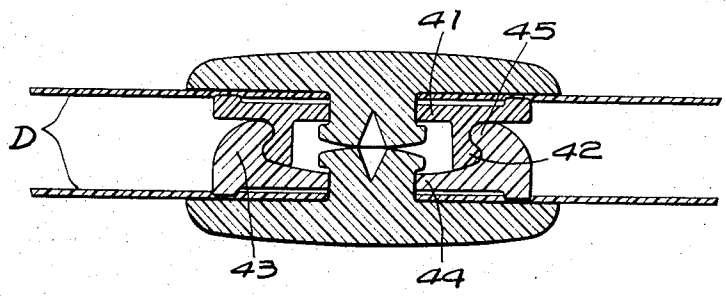


FIG. 7

FIG 8



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United States Patent Office 3,349,451
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3,349,451

PLASTIC GRIPPER BUTTON

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Continuation of application Ser. No. 347,250, Feb. 25, 1964. This application Apr. 1, 1966, Ser. No. 549,082
Claims priority, application Japan, July 10, 1963, 38/52,112
6 Claims. (Cl. 24—208)

The present invention relates to an improved gripper bottom of plastic construction of the type attached to a piece of cloth or other fabric such as an article of wearing apparel; and, the present application is a continuation of my prior application Ser. No. 347,250, filed Feb. 25, 1964, now abandoned.

Gripper buttons of the present type conventionally include a pair of gripper members engageable and disengageable with a snap action, each gripper member being assembled to a backing member, which will be referred to herein as a "button" member, with a layer of fabric sandwiched inbetween. In conventional practice, the gripper and button members have been constructed for manufacture from a plastic material in such a way that the process of assembly of a gripper member to a button member requires a permanent deformation of one member of the other by the application of heat, or pressure, or both. The tooling required for this assembly operation is relatively expensive and cumbersome, and in a practical sense limits the installation and replacement of gripper buttons to facilities equipped with this special tooling.

The principal object of the present invention is to provide a gripper button of all plastic construction, for long life and freedom of discoloration of the fabric to which it is attached, in which the gripper and button elements can be assembled to the fabric by simple application of pressure and preferably with negligible deformation of either element. The object is to enable the assembly operation to be carried out by hand, or with a hand-operated portable implement such as a pliers.

A plastic gripper button constructed in accordance with the invention comprises a pair of inter-engageable gripper members and a pair of button members, two of these members each being formed with a central aperture and the other two members each being formed with a central projecting stem adapted to be engaged in one of the apertures, each stem having a main portion with a cross-sectional area substantially equal to the cross-sectional area of the central aperture it is to engage and terminating in a rounded end portion having an enlarged rim thereon. The inner side of the rim protrudes radially from the main portion of the stem at an angle substantially equal to a right angle, thereby forming a sharply stepped flange between the main and terminal portions of the stem. A recess is formed centrally in the rounded end portion of the stem and extends longitudinally inwardly of the terminal portion into the main portion of the stem to permit resilient deformation of the enlarged rim portion surrounding the recess. By the application of pressure each gripper member can be securely assembled to a button member by forcing the stem through the aperture to produce overlapping engagement between the enlarged rim portion of the stem of one member with the edge of the central aperture in the other member.

Other features and advantages of the invention will appear from the following description of the representative embodiments disclosed in the accompanying drawings in which:

FIGURE 1 is a sectional elevation of a pair of gripper and button members in assembled relation;

FIGURE 2 is a plan view of the inner side of a button member of FIG. 1;

FIGURE 3 is a plan view of the outer side of the male gripper member;

FIGURE 4 is a plan view of the inner side of the male gripper member;

FIGURE 5 is a plan view of the inner side of the female gripper member;

FIGURE 6 is a plan view of the outer side of the female gripper member;

FIGURE 7 is a sectional elevation of a modified form of male gripper element assembled to a button element;

FIGURE 8 is a sectional view similar to FIG. 7 showing a further modification of a complete gripper button assembly; and

FIGURE 9 is a sectional view of a modified construction.

In FIGS. 1–6 a male gripper element A of plastic material consists of a disc-shaped member **1** provided with a central aperture **2**, a ring projecting from the inner side of the member **1** and having an enlarged rim **4** formed on the end of the outer wall thereof. The opposite or outer side of the member **1** has a projecting annular brim **5**. A plastic female gripper element B is a disc-shaped member **6** provided with a central aperture **7**, an annular portion **8** projecting from the inner side thereof with an inwardly projecting rim **9**; and, an annular brim **10** is formed around the periphery of the outer side of the member **6**. The outer diameter of the rim **4** of the male gripper member almost corresponds to the inner diameter of the annular projection **8** of the female member for inter-engagement of the male and female members as shown.

A pair of button elements C are each provided with a centrally projecting stem **11** terminating in a rounded end portion **13** having an enlarged rim thereon. The portion of the stem **11** inwardly of the rounded end portion **13** will be referred to as the main portion of the stem and has an outer diameter, or cross-sectional area, substantially equal to the diameter or area of the central apertures **2** and **7** in the male and female gripper members respectively, while the inner side of the rim on the end portion **13** protrudes radially from the main portion of the stem at an angle substantially equal to a right angle, thereby forming a sharply stepped flange between the main and end portions of the stem. Each stem **11** is further provided with a recess **12** formed centrally in the rounded end portion **13** thereof and extending inwardly of the end portion into the main portion of the stem so that the recess is surrounded by and extends inwardly of the enlarged rim on the end portion.

The construction of the recessed stem **11** of the button element C enables it to be inserted within an aperture of a gripper element and assembled to a piece of cloth or fabric D by a simple application of pressure to force the enlarged end portion **13** of the stem through the aperture into overlapping engagement between the enlarged rim and the edge of the central aperture. The recess **12** in the stem permits elastic deformation of the stem with negligible permanent deformation, and the operation can be performed by a hand tool.

In the construction of FIG. 7, a button element **31** is provided with a central aperture **32**, and the gripper element **33** is provided with a stem **34** projecting oppositely from its annular gripping portion **35**. The stem **34** is constructed in a manner similar to the stem **11** of the button element C enables it to be inserted within an aperture manner.

In FIG. 8, the male gripper member **41** is assembled to a button element in the manner previously described, but is provided with a modified rounded gripping projection **42** engaging a complementary shaped recess in the gripper portion **45** of the female gripper element **43**. The central

portion **44** of the female gripper element, in which the stem receiving aperture is formed, is of tapered section, being thinner and more resilient adjacent the edges of the aperture to facilitate insertion of the stem portion of the button element therein.

In the construction of FIG. 9 the button element C having a projecting stem **101** is provided with a recess **102** which extends axially through the stem, but which is restricted adjacent the end portion of the stem. The stem is provided with an enlarged rim portion **103** as previously described. Assembly of the button element C to a gripper element is facilitated by a driving element E affixed to a hand operated tool (not shown) which is inserted into the recess **102** in the button element, and which, if driven clear through the recess, encounters the restricted portion adjacent the end of the stem to expand the rim portion **103** into greater overlapping engagement with the portion **104** of the gripper element around the aperture therein.

While preferred embodiments have been described above in detail, it will be understood that numerous modifications might be resorted to without departing from the scope of the invention as defined in the following claims.

I claim:

1. A plastic gripper button of the type comprising a pair of interengageable gripper members each adapted to be assembled to one of a pair of button members with a layer of fabric material in between a gripper and button member, wherein prior to such assembly two of said members are each formed with a central aperture and the other two of said members are each provided with a central projecting stem adapted to be engaged in one of said apertures at the time of assembly, each stem being formed with a main portion with a cross-sectional area substantially equal to the cross-sectional area of the central aperture it is to engage, each stem terminating in a rounded end portion having an enlarged rim thereon, with the inner side of said rim protruding radially from the main portion of the stem at an angle substantially equal to a right angle, thereby forming a sharply stepped flange between the main and end portions of the stem, and a recess formed centrally in the rounded end portion of the stem and extending inwardly of the end portion into the main portion of the stem to permit resilient deformation of the enlarged rim portion surrounding said recess at the time of assembly, whereby each gripper member can be securely assembled to a button member by a simple pressing operation to produce overlapping engagement between the enlarged rim of the stem of one member and the edge of the central aperture in the other member.

2. A plastic gripper button according to claim **1** wherein the gripper members are each formed with said central aperture, and wherein each button member is formed with said projecting stem.

3. A plastic gripper button according to claim **1** wherein the gripper members are each formed with said projecting stem, and wherein the button members are each formed with said central aperture.

4. A plastic gripper button according to claim **1** wherein at least one of the members having said central aperture formed therein is constructed with a portion of increasing thickness extending outwardly from the edge of said aperture.

5. A plastic gripper button according to claim **1** wherein said recess formed in the stem extends axially therethrough between the end portion of the stem and opposite face of the stem-provided member.

6. A plastic gripper button according to claim **5** wherein said axially extending recess is restricted in diameter adjacent the end portion of the stem.

References Cited

UNITED STATES PATENTS

2,548,004	4/1951	Duefrene	24—208
2,898,656	8/1959	Ashworth	24—127
2,990,595	7/1961	Van Buren	24—208
3,107,408	10/1963	Huelster et al.	24—208
3,159,890	12/1964	Jensen	24—214
3,195,201	7/1965	Ash II	24—208

FOREIGN PATENTS

995,542	8/1951	France.
218,338	11/1958	Australia.

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E. SIMONSEN, *Assistant Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,349,451 October 31, 1967

Minoru Maeno

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 28, for "of", first occurrence, read -- or -- column 2, lines 66 and 67, for "enables it to be inserted within an aperture manner." read -- previously described and functions in a similar manner. --.

Signed and sealed this 3rd day of December 1968.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents