March 7, 1950 A. F. ANDERSON 2,499,898

CLASP

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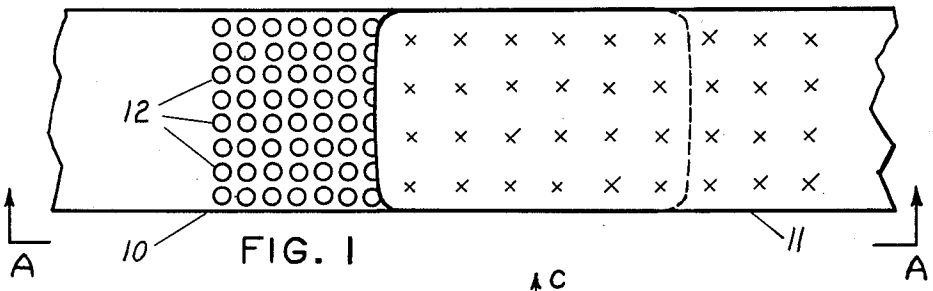


FIG. 1

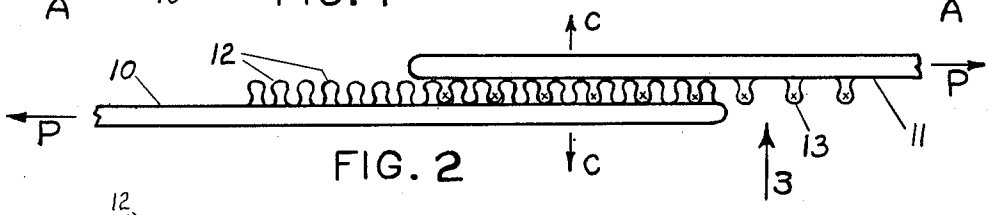


FIG. 2

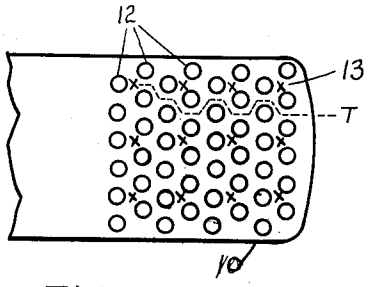


FIG. 6

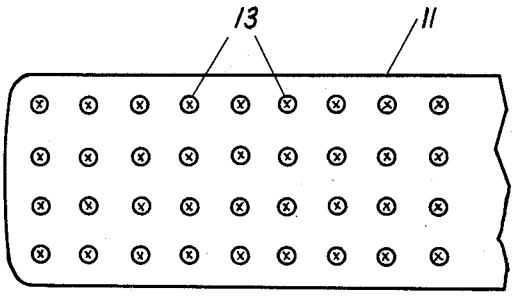


FIG. 3

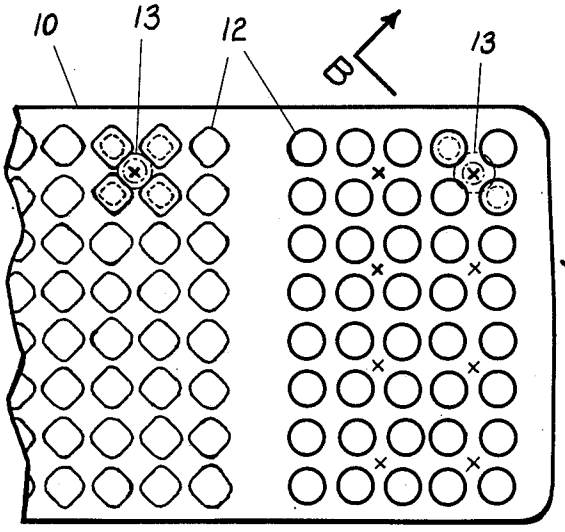


FIG. 4

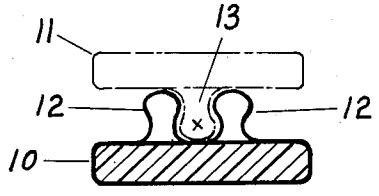


FIG. 5

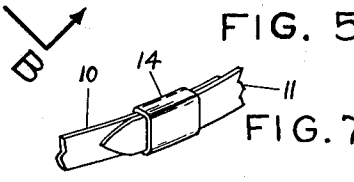


FIG. 7

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CLASP

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1 Claim. (Cl. 24—206)

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This invention relates to improvements in clasps or fastenings for use with wearing apparel, such as garments, shoes, belts, suspenders and similar articles.

It is the object of this invention to produce a fastener in the nature of a clasp, which is adapted for general use, but more particularly for use with wearing apparel and which can be manipulated with ease and rapidity without the necessity of careful alignment or adjustments and which, to a large extent, is self-adjusting after being fastened.

Another object is to produce a clasp for the purpose above pointed out which will be particularly well adapted for use in connection with surgical bandages and which is of such construction that it will yield in response to excessive strains without breaking or becoming unfastened, and which, therefore, effects an automatic adjustment that prevents the formation of strains of such magnitude that they produce breakage of the article to which the clasps are attached, or discomfort to the person wearing the garment.

This invention, briefly described, comprises two complementary members or parts of similar form so constructed that they may be securely interconnected when lapped over each other and pressed together, and which may be readily separated again by exerting forces tending to move the lapped surfaces apart. Articles attached to the clasped parts may thus be securely held together and readily separated.

The above and other objects of the invention that may appear as the description proceeds are attained by means of a construction and an arrangement of parts that will now be described in detail and for this purpose reference will be had to the accompanying drawings in which the invention has been illustrated in its preferred form and in which:

Figure 1 is a top plan view showing the clasped parts in overlapping and interconnected position;

Figure 2 is an edge view looking through plane A—A, in Figure 1;

Figure 3 is a plan view of one of the surfaces looking in the direction of arrow 3, in Figure 2;

Figure 4 is a plan view showing two specifically different interconnecting means;

Figure 5 is a section taken on line B—B, Figure 4, and in which the complementary part has been shown in dot and dash lines;

Figure 6 is a view showing a slightly modified form of the invention; and

Figure 7 is another modification of the invention.

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In the drawing reference numerals 10 and 11 designate the two complementary clasp members which may be secured to the ends of a belt, a bandage or a garment or any other two members that are to be interconnected.

During this description it will be assumed that the material employed is made from some flexible or semi-flexible material of which some of the many plastics now on the market are examples.

It is to be understood, of course, that any material or combination of materials suitable for the purpose can be employed. The member designated by reference numeral 10 is provided on one surface with a large number of prongs 12 that are spaced uniform distances apart in transverse and longitudinal rows. This spacing provides a construction in which any four members form a socket like that shown in Figure 4.

The complementary clasp member that has been designated by reference numeral 11 is provided on its under surface, when viewed as in Figure 2, with a large number of projections or prongs 13 that are spaced in longitudinal and transverse rows twice as far apart as the corresponding prongs 12 on member 10. Prongs 12 and 13 are formed with enlarged heads that cooperate to hold parts 10 and 11 together when engaged. Those on member 11 have been designated by a small x and are shown most clearly in Figure 5. The crosses appearing in Figure 1 are merely intended to designate the positions of the prongs on the under surface. The prongs on members 10 and 11 are preferably of approximately the same shape and size and the heads or the enlargements x on prongs 13 are of such size that in order to position them in a socket formed by four prongs 12, as shown in Figures 4 and 5, prongs 12 will be spread apart sufficiently to permit the heads x on prongs 13 to enter the sockets. The necks of prongs 13 may be slightly larger than the space between the surfaces of the heads of prongs 12 in each row, although in Figure 5 it appears otherwise because the section has been taken on a diagonal plane.

Due to the symmetrical spacing of prongs 12, sockets for prongs 13 are formed and due to the wider spacing of prongs 13, the spaces between sockets having prongs in engagement are unobstructed, leaving space for the free movement of the heads of prongs 12 when they are forced apart by the heads of prongs 13 during the process of opening and closing the clasp and also during the translatory movement of prongs 13 from one socket to another, which occurs when

the clasp yields to excessive forces. An excessive force in the direction P—P, Figure 2, will cause such a movement, for example. To open the clasp the parts 10 and 11, Figure 2, are moved apart in the direction of arrows C—C. To close the clasp, parts 10 and 11 are merely overlapped and pressed together; the prongs of each part will intermesh in the manner described and the heads of the prongs will interlock to keep the clasp from separating.

In Figure 7, a slide 14 is employed to keep the clasp from separating and the intermeshed prongs may then be without heads or enlargements. To open this clasp the slide is first shifted away from the overlapped surfaces of the clasp and the two parts may then be separated.

Referring to Figure 2, it is apparent that the clasp may be disengaged or separated by grasping the end of member 11 and pulling it away from member 10 and flexing it at the same time so that only a few rows of prongs will become disengaged at a time and this progressively, until all are released.

Thus a much smaller force is required to disengage the clasp than would be required if the holding power of all the interlocked prongs were to be overcome at one time.

When the two parts of the clasp are engaged, forces acting in a plane parallel to the engaged surfaces, as, for example, in direction P—P, will be resisted collectively by all prongs 13 that become intermeshed with prongs 12, but if an excessive force is applied in this direction, the clasp will yield, allowing the surfaces to slide past each other because the collective resistance of the intermeshed prongs is overcome and prongs 13 move progressively from socket to socket formed by prongs 12, which are designed to permit this movement while remaining interlocked against forces tending to separate the engagement surfaces of the clasp parts 10 and 11.

In order for prongs 13 to move from one socket to another, it must overcome the resistance required to spread the heads of prongs 12 apart slightly; therefore, the necks of prongs 12, or the base on which they are mounted, must flex sufficiently to permit this movement. The collective resistance of a great many individual prongs is, of course, quite large, even though the resistance of each prong is small.

It should be explained that the invention has been shown to a greatly enlarged scale on the drawing so as to facilitate description and understanding of the operation. In the actual clasps, however, prongs 12 and 13 are very much smaller than shown; prongs 12, for example, may be as small as one thirty-second ($\frac{1}{32}$) of an inch in height, the cooperation and relationship being the same for all sizes. There is no reason why clasps constructed in this manner cannot be made of the size shown in the drawing.

Referring now to Figure 4, it will be observed that two groups of prongs 12 have been shown. In the group to the right the prongs are circular, while those in the group to the left have a rectangular cross section. This showing is presented merely for the purpose of illustrating the fact that a circular cross section is not an essential to the invention; however, it is believed that a circular cross section of the prongs is preferable, both from the point of manufacture and of operation.

In Figure 5, the position of prong 13 has been indicated by the small letter *x*. The number of prongs that are interlocked depends, of course, upon the length of the overlap, other things being equal.

By means of the spacing and relative position of the two sets of prongs, the resistance offered to forces tending to separate the parts by a longitudinal movement can be varied and in the preferred arrangement the separate resistances of the prongs are comparatively small. However, by employing a large number of interlocking prongs and sockets, the resistance may be increased to any desired amount. Where the clasp is employed in connection with bandages or belts, the parts may be of such relative proportions that a longitudinal adjustment will automatically be effected with forces that do not injure the wearer or patient.

It is evident that if prongs 12 and 13 are arranged in rows parallel with the forces acting to separate the parts, the heads of prongs 12 must be moved apart slightly in order to let prongs 13 pass. If prongs 13 could move freely, there would be no effective resistance in the fastening.

In Figure 6, prongs 12 have been arranged in groups of three, each three prongs forming a socket. With the triangular arrangement, prongs 13 can move only a short distance before their movement brings them into engagement with prongs 12, prongs 13 must then change their direction of motion. In Figure 6, one of the several possible paths have been indicated by the dotted line T. The heads on the prongs may be small, compared to the stem, when the triangular arrangement shown in Figure 6 is employed, and since their principal function is to prevent accidental separation, it is possible to employ cylindrical pins and provide some other means to prevent separation, as, for example, in Figure 7, a slide is used for this purpose.

Having described the invention what is claimed as new is:

A clasp comprising, two overlapping members, each having a plurality of prongs extending from one side thereof, said prongs having enlarged portions interlockingly engaging reduced portions on the complementary member, said prongs being resilient and the interlock such that the members resist separation against a predetermined force in a direction longitudinally of said prongs and also resist relative movement in a direction longitudinally of the members, but may slide relative to one another to a new position of interlock upon application of a force in excess of said last predetermined force.

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