Oct. 19, 1943. H. J. REITER 2,332,167

FASTENER INSTALLATION

Filed Oct. 29, 1942

Fig. 1.

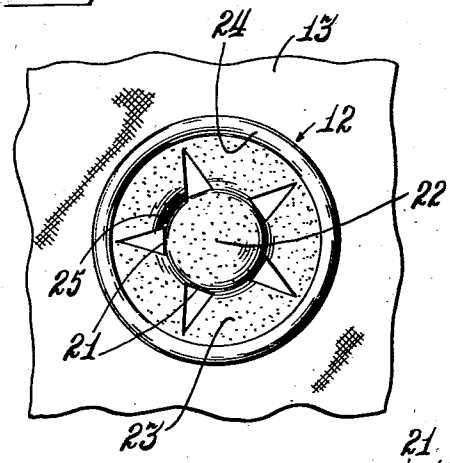


Fig. 2.

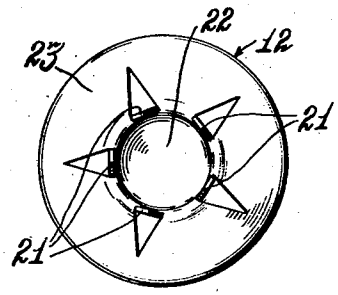


Fig. 3.

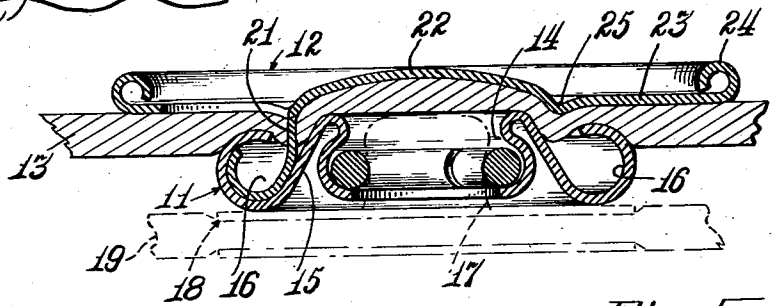


Fig. 4.

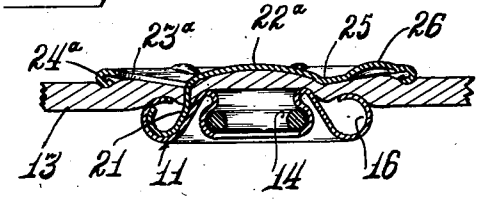


Fig. 5

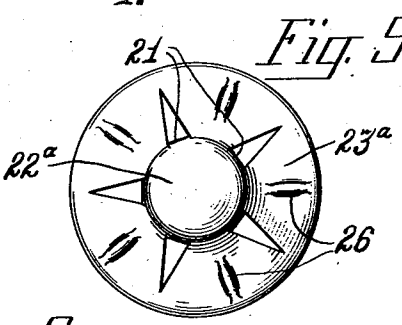


Fig. 7.

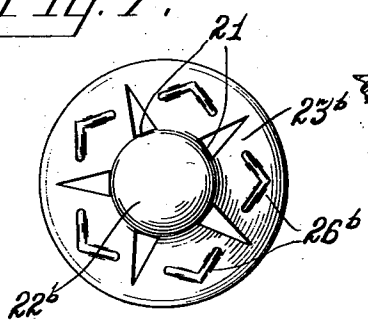
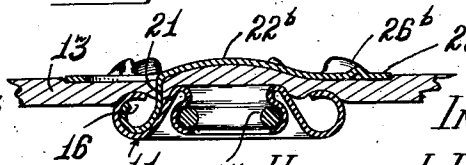


Fig. 6.



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FASTENER INSTALLATION

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Application October 29, 1942, Serial No. 463,751

9 Claims. (Cl. 24—218)

The invention relates to improvements in fastener installations and more particularly to an attaching member or pronged cap for securely attaching a snap fastener element to a supporting sheet.

The present invention is concerned primarily with the structure, organization and novel disposition and formation of the component parts of a member used to attach snap fastener elements to a supporting sheet. The invention embodies improvements over perforate attaching caps of the type shown in United States patents to Buckley, No. 2,293,587, dated August 18, 1942, and Reiter, No. D–133,348, dated August 11, 1942. Certain objectionable characteristics have been observed in the use of those items with so-called laundry-proof fastener elements of the type having a central stud-receiving socket open at each end and an annular clenching channel. One objection is the tendency of the perforate center portion of the cap and the underlying portion of the material to be deflected downwardly into the open end of the socket upon application of external pressure. This occurs, for example, when the weakened center portion is struck or pressed while the material to which it is attached is being laundered and ironed. Obviously, the effective depth of the stud-receiving socket is reduced, frequently to such an extent as to prevent full insertion and proper engagement of its complemental stud element. This objectionable characteristic is, of course, more noticeable in the prior Reiter cap because of its normal domed formation.

Further, known types of perforate caps also include clenching prongs limited in length to less than one-half the diameter of the circle along which they are attached to the cap. The diameter of that circle necessarily is determined by the diameter of the entrance opening to the annular clenching channel of the complemental socket element. As a result, the use of the known types of caps is limited to installations on sheets having a maximum thickness considerably less than the fixed prong length.

These and such other objectionable characteristics of known attaching members are overcome in the instant organization which has for an object the inclusion of novel means to provide an attaching member having struck out integral prongs surrounding a domed imperforate center hub portion which is adequately shielded to prevent its collapse or downward distortion when subjected to external pressure.

Another object is to provide a pronged one-piece attaching cap of the character referred to with an imperforate center portion and integral prongs struck from the material surrounding said portion without lessening the sheet clamping action of said surrounding portion when installed.

Another object is to form a fastener cap from a sheet of material having different surface finishes on opposite surfaces, in such a manner that at least a part of both surfaces is disposed on one face of the finished article so as to present a neat and attractive appearance.

The foregoing, and such other objects of the invention as will appear hereinafter as the description proceeds, will be more readily understood from a perusal of the following specification, in which reference is had to the accompanying drawing, wherein:

Fig. 1 is a plan view showing an attaching cap installed on a sheet of material.

Fig. 2 is a bottom plan view of the cap shown in Fig. 1.

Fig. 3 is an enlarged longitudinal central sectional view of the Fig. 1 fastener installation.

Fig. 4 is a sectional view similar to Fig. 3, showing, on a reduced scale, a modified form of fastener installation.

Fig. 5 is a top plan view of the attaching cap illustrated in Fig. 4.

Fig. 6 is a sectional view similar to Fig. 4, illustrating another form of attaching cap.

Fig. 7 is a top plan view of the cap shown in Fig. 6.

Referring now to Figs. 1 to 3 of the drawing, Fig. 3 best illustrates the improved fastener installation which includes a circular socket element 11 and a circular attaching member 12 disposed on opposite sides of a sheet of flexible material 13. These parts preferably are each formed from a circular piece of sheet material. The socket element illustrated by way of example, is of the type commonly known as a laundry-proof socket and comprises a central stud-receiving socket 14, open at both ends, having an outwardly downwardly inclined surrounding wall 15 formed with its peripherial margin rolled upwardly and then inwardly to define a clenching channel 16. The stud-receiving socket is adapted to receive and frictionally retain a stud 17 of a complemental fastener element 18 suitably attached to another sheet 19.

To install, the socket element 11 is positioned on one face of sheet 13 prior to attachment and the attaching cap 12 is located in axial alignment therewith on the opposite side of sheet 13. The parts are then subjected to sufficient pressure to

force piercing prongs 21, formed integral with the attaching cap, through the material 13 and into the clenching channel 16, thereby fixedly securing the parts in their relative positions.

The prongs 21 are located on the cap 12 in an annular series positioned between the center of the cap and its peripherial edge, thereby defining a central hub portion 22 and a surrounding flange or marginal portion 23. The hub portion 22 is domed upwardly, as shown so as not to interfere with or otherwise obstruct the stud-receiving socket. The prongs 21 preferably are triangular in shape and are cut and pressed out of the marginal portion 23, hence the domed hub portion 22 remains imperforate and, as a consequence, is not easily deformed.

It should be evident at this time that any downward deformation or crushing of the center hub portion 22 will decrease the effective length of the stud-receiving socket 14 and prevent full insertion and firm gripping engagement of the stud by the socket. Accordingly, another feature of the present invention is to shield or otherwise protect the domed portion 22 against inadvertent destructive deformation. To this end the circumferential edge portion of the marginal flange 23 preferably is rolled upwardly, inwardly, and then downwardly to define an annular bead 24 having its upper wall located in a plane at least as high as the top plane of the domed hub portion 22. Obviously, the annular bead protects the hub portion against the application of pressure downwardly while the material to which the fastener is attached is being laundered or ironed. The reinforced peripheral edge of the flange 23 also prevents distortion of said flange and minimizes the possibility of said edge cutting or tearing through the material. If desired the bead 24 may be in a plane slightly higher than the domed hub.

Judicious selection or surface finishing of the material used to form the caps further increases the practical value of the reinforced peripherial edge. For example, when the cap is formed from a sheet having one surface painted, roughened or otherwise distinguishable from its other surface, the bead on its peripherial edge results in a clearly distinguishable neat and attractive margin. In the event both surfaces of the material are enameled, the coating on the uppermost surface of the reinforcing bead may be removed by scraping or wiping so as to leave a clearly distinguishable border surrounding the attaching member.

When the material 13 is pierced by the attaching prongs during the assembly operation such material necessarily is weakened. It therefore is advisable to securely clamp the material in an area outwardly of said piercing prongs and to this end the marginal portion 23 may be shaped, in part, to conform substantially to the contour of the underlying channeled peripherial edge of the socket element. This formation, which takes the shape of a slight arch, terminates at the junction of the flange with the center hub portion preferably in an annular recess 25. The formation of the recess 25 produces an annular ridge on the bottom face of the attaching cap at the point of attachment of the prongs thereto. When the parts are assembled the annular ridge axially aligns with and extends toward the entrance of the clenching channel 16, hence the effective length of the prongs is materially increased.

A desirable characteristic of the instant construction is the complete lack of any limitation in the length of the struck-out prongs. In the known prior devices the prong length is limited to one-half the diameter of the perforate center hub. Such caps are accordingly incapable of use in a fastener installation when the latter is installed on material having a thickness greater than the maximum effective length of such prongs. In the present instance, the maximum prong length is determined solely by the width of the marginal portion 23 which may be increased or decreased according to the needs of the installation. In any event, the prongs are of a length not exceeding the distance between the periphery of the imperforate hub portion and the peripherial edge of the marginal portion 23. This construction prevents weakening of the peripherial edge of the marginal portion which, for satisfactory and effective use, must be unbroken and preferably reinforced as illustrated.

The attaching member illustrated in Figs. 4 and 5 is substantially like that shown in Fig. 1 and previously described except that in this instance the perforate marginal flange portion 23*a* is inclined outwardly slightly from the annular depression 25 and has a downwardly inwardly rolled reinforcing bead 24*a* on its peripherial edge. Its imperforate center hub 22*a* may be protected against destructive pressure by a plurality of protuberances, preferably taking the form of radial ribs 26 circumferentially spaced on the perforate marginal portion 23*a*. These ribs also are of a height not less than the over-all height of the domed hub portion 22*a* and consequently prevent any object placed over the installation from crushing the domed hub. Further, the ribs 26 reinforce the marginal flange and lend to the neat and attractive appearance of the cap. In other respects the installation is like that previously described.

In the attaching cap shown in Figs. 6 and 7, the imperforate domed center portion 22*b* may be adequately protected against being crushed by suitable symmetrically arranged upwardly extending reinforcing ornamental projections or ribs 26*b* which also terminate in a plane at least equal to or even slightly above the top plane of the domed hub. In this embodiment, the perforate circumferential flange 23*b* is substantially flat and merges gradually with the domed hub portion.

It should be apparent at this time that the improved attaching members illustrated herein are stronger and more durable than known types and are each characterized by an imperforate domed hub portion suitably guarded or shielded against deformation and that the peripherial edge of the perforate marginal flange in each type of attaching cap is unbroken. The various types of caps are also suitably formed to insure tight clamping of the sheet to which the installation is attached both inwardly and outwardly of the piercings made by prongs 21. Further, the improved attaching members have been shown with five prongs pierced from the marginal flanges, but it should be understood that any practical number may be provided and that such piercings preferably are arranged radially in symmetrical form.

Although preferred embodiments of the invention have been disclosed in the drawing and described in detail, it is to be understood that the disclosure and the description is illustrative only and that the invention may embody various minor changes and refinements without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A cap for a snap fastener, said cap having an imperforate center portion and an annular marginal portion, and an annular series of prongs cut from the marginal portion and integrally joined to the cap at the juncture of said portions, said prongs being of a length less than the width of the marginal portion thereby providing an unbroken peripherial edge on said portion.

2. A cap for a snap fastener, said cap comprising a disc having an imperforate domed center portion and an annular marginal portion, and an annular series of prongs cut from the marginal portion and integrally joined to said disc at the juncture of said portions, said prongs extending downwardly from said disc and being of a length substantially less than the width of the marginal portion thereby providing an unbroken peripherial edge on said portion.

3. A cap for a snap fastener, said cap comprising a plate having a domed center portion and a surrounding flange, an annular depression at the base of said center portion, and an annular series of prongs cut from the flange and integrally joined to said plate at the annular depression, said prongs extending downwardly and being of a length substantially less than the width of the flange.

4. A cap for a snap fastener, said cap having a domed center portion and a surrounding marginal portion, an annular depression at the juncture of said portions, and an annular series of prongs cut from the marginal portion and integrally joined to the cap at the annular depression, said prongs extending downwardly and being of a length less than the width of the marginal portion, and a protuberance on said marginal portion terminating at least in the plane of the top of said domed portion.

5. A cap for a snap fastener, said cap having an imperforate center portion and an annular marginal portion, and an annular series of prongs cut from the marginal portion and integrally joined to the cap at the juncture of said portions.

6. A cap for a snap fastener, said cap having a center portion and an annular marginal flange, said flange being disposed in a plane below the plane of the center portion, an annular series of prongs cut from the marginal flange and integrally joined thereto along its inner margin, and means on said flange disposed to a height at least equal to the plane of the central portion to shield said portion from externally applied pressure.

7. A cap for a snap fastener, said cap having a center portion and an annular marginal flange, said flange being disposed in a plane below the plane of the center portion, an annular series of prongs cut from the marginal flange and integrally joined thereto along its inner margin, and at least a part of said flange being disposed to a height at least equal to the plane of the central portion to shield said portion from externally applied pressure.

8. A cap for a snap fastener, said cap comprising a plate having a domed center portion and a surrounding flange, an annular series of prongs cut from the flange and integrally joined to said plate at the juncture of said flange and center portion, and a circumferential bead on the surrounding flange having its top surface disposed substantially in the plane of the domed portion to shield said portion from externally applied pressure.

9. A cap for a snap fastener, said cap comprising a plate having an imperforate domed portion and a surrounding flange, an annular series of prongs partially cut from the flange and bent downwardly at right angles thereto, and a bead surrounding said flange having its top surface disposed substantially in the plane of the domed portion to shield said portion from externally applied pressure.

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