July 18, 1939. E. E. JONES 2,166,894

SNAP FASTENER SOCKET AND INSTALLATION THEREOF

Filed April 23, 1938

Fig. 1.

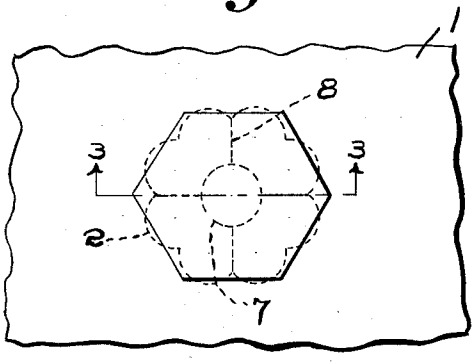


Fig. 2.

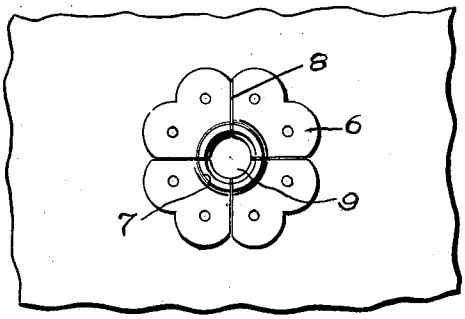


Fig. 3.

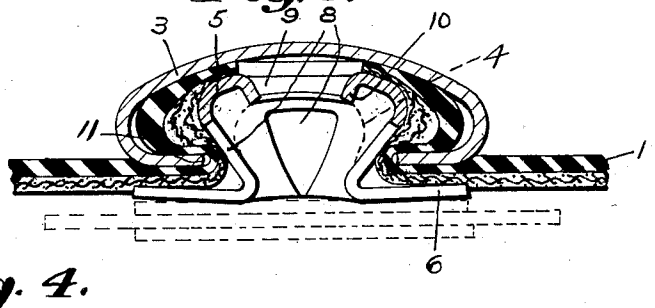


Fig. 4.

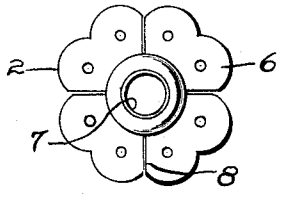


Fig. 5.

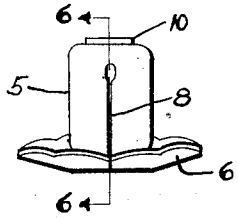
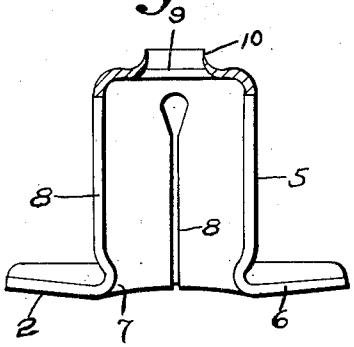


Fig. 6.



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SNAP FASTENER SOCKET AND INSTALLATION THEREOF

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Application April 23, 1938, Serial No. 203,863

7 Claims. (Cl. 24—216)

My invention aims to provide improvements in snap fastener sockets and installations thereof and more particularly to a self-piercing fastener socket for overshoes and similar rubber articles.

Referring now to the embodiment of my invention illustrated by the annexed drawing:

Figure 1 is a plan view of a snap fastener socket installation showing a portion of a supporting material;

Fig. 2 is a bottom view of the socket installation shown in Fig. 1;

Fig. 3 is an enlarged section taken on the line 3—3 of Fig. 1, a cooperating stud installation being shown in dotted line;

Fig. 4 is a plan view of the yieldable socket member per se, which part embodies the gist of my invention;

Fig. 5 is a side elevation of the socket member shown in Fig. 4; and

Fig. 6 is an enlarged section taken on the line 6—6 of Fig. 5.

My invention relates primarily to the improvement in a socket member which has been used for years in connection with the rubber footwear trade wherein the footwear is made up of a composition of a cloth-like material and rubber. There have been various methods of applying the fastener sockets to that type of material and in most cases the sockets which have an expansible barrel portion are attached to the material by expanding the barrel within a capped member. In most cases the barrel was entered through the material into the cap by means of passage through a pre-formed aperture in the material. Applicant is aware of another method of assembly of such parts wherein the barrel forced part of the flexible material into the cap and the barrel was expanded with the material drawn up into the cap. This last method, while being cheaper because it eliminated the necessity for first making an aperture, has been troublesome because it has caused wrinkling of the material, improper tension of the socket member for cooperation with a stud member, improper collapsing of the barrel member and a variation in the action of the fastener especially when the parts are assembled and thereafter the material is vulcanized.

My invention has to do with the so-called self-piercing type of socket because it contemplates attaching the parts to the material without first punching a hole. It has for its purpose the correction of the difficulties heretofore encountered with this type of socket installation. Heretofore the barrel of the socket has been made so that it would be imperforate at one end. I propose to provide the same type of socket but to perforate the heretofore imperforate end, thus providing for two distinct advantages. In the first place, it has weakened that end of the socket to such an extent that it expands more readily and more uniformly than has been possible heretofore. In the second place, it actually pierces a hole in certain types of material thus relieving the stresses exerted upon that material when pressed into the cap by the barrel portion. This perforated barrel end and the advantages thereof will be more fully understood as the detailed construction of the invention is set forth hereinafter.

Referring now to the specific form of my invention selected for illustrative purposes, I have shown a socket installation which includes a flexible material 1, like that used by various overshoe manufacturers, a one-piece sheet metal yieldable socket member 2 and a sheet metal cap member 3, all shown in Fig. 3. My socket member is adapted to cooperate with the usual type of stud member 4 shown in dotted lines in Fig. 3 in snap fastening engagement therewith. The socket member 2 is shown before attachment in Figs. 4, 5 and 6 and includes a hollow barrel portion 5 having a flange 6 at one end surrounding a stud-receiving aperture 7 and divided by slits 8 extending entirely through the flange and up the side of the barrel almost to the opposite end of the barrel, as shown in Figs. 4 and 6. At that end of the barrel 5 opposite the end where the flange is located I have pierced a hole 9 which is preferably surrounded by a burr 10 or slight wall the purpose of which will be more fully hereinafter explained. The size of this aperture may be varied according to how weak it is desirable to have that end of the barrel, or how large a hole it is desired to punch in the material 1 by means of the burr 10.

In assembling the parts of my improved socket I use any suitable mechanism such, for instance, as an automatic attaching machine which preferably feeds the socket parts 2 to the lower jaw or die of the machine, while the caps are fed to the upper jaw or upper die of the machine. With the socket and cap separated the flexible material 1 is inserted between them and then one of the parts is moved toward the other thereby forcing the barrel portion 5 in its form shown in Fig. 5 through the aperture 11 in the under side of the cap 3. The barrel carries the material 1 up through the aperture 11 and against the under surface of the top portion of the cap. As the

movement of the parts toward each other continues, the burr 10 on the socket cuts through the material 1 thereby punching out a piece the size of the aperture 9 thereby relieving the strain on the material 1. Thereafter as the parts are moved together the upper portion of the barrel 5 begins to collapse and the upper end becomes enlarged until the parts are secured tightly against the material 1. During the attaching operation the burr 10 flattens or turns inside-out, as shown in Fig. 3, and the cutting of the material and distortion of the burr and barrel take place without marking the cap 3.

It should be understood that I may provide a socket with an aperture 9 at the upper end of the barrel which is not surrounded by a burr but that in either event the socket may be used for attachment to material which cannot be cut during the attaching operation. However, I have found that it is desirable to provide an aperture 9 in that type of installation to weaken the top of the barrel thereby securing uniform setting of the socket member during attachment with a resulting improvement in the spring action of the socket and elimination of faultily set fasteners.

While my improved socket and socket installation appear to be very simple, nevertheless it has resulted only after years of experimentation of which I have been aware and, so far as I know, the construction which I have incorporated in a well known type of fastener has been the only one to provide all of the improvements which I have set forth above.

While I have illustrated and described a preferred embodiment of my invention, it should be understood that I do not wish to be limited thereby, because the scope of my invention is best set forth in the following claims.

I claim:

1. A snap fastener socket formed from a single piece of yieldable metal and having a collapsible barrel portion, a flange at one end of said barrel portion surrounding a stud-receiving aperture, said flange and at least a portion of said barrel portion divided to permit enlargement of the stud-receiving aperture for reception of a rigid stud member, and support-piercing means at that end of the barrel opposite the flange.

2. A snap fastener socket member formed from a single piece of sheet metal and having a laterally yieldable apertured barrel portion to receive a cooperating stud and support-piercing means at one end of the barrel.

3. A snap fastener socket member formed from a single piece of sheet metal and having a yieldable and collapsible barrel portion, one end of which has an aperture surrounded by a laterally yieldable wall which cooperates with a rigid stud member and the other end of which collapses to attach it to a support and said collapsible end having an aperture to assist in collapsing.

4. A snap fastener socket member formed from a single piece of sheet metal and having a yieldable and collapsible barrel portion one end of which has an aperture surrounded by a laterally yieldable wall which cooperates with a rigid stud member and the other end of which collapses to attach it to a support, said collapsible end having an aperture therein to assist in collapsing and a burr adjacent to said aperture to permit said barrel portion to cut through the support.

5. A snap fastener socket installation comprising, in combination, a normally imperforate flexible material, a snap fastener socket member having a barrel portion, a hollow cap member, said barrel portion being expanded within said cap member with the flexible material interposed between the barrel and the cap member and said barrel having an aperture at the entering end for the purposes described.

6. A snap fastener socket installation comprising, in combination, a normally imperforate flexible material, a snap fastener socket member having a barrel portion, a hollow cap member, said barrel portion being expanded within said cap member with the flexible material interposed between the barrel and the cap member, said barrel having an aperture at the entering end, a burr normally surrounding said aperture, and said flexible material having an aperture cut by the burr and located in line with the aperture in the entering end of said barrel.

7. A snap fastener socket installation comprising, in combination, a flexible carrying material, a hollow cap on one side of said material and a socket on the other side, said cap having an inturned flange at that side next to the carrying material, said flange surrounding an aperture, said socket having a laterally yieldable flange portion surrounding a stud-receiving aperture and a barrel portion extending from said flange into said cap and flared outwardly therein, said barrel having carrying material piercing means at that end which enters the cap and said carrying material extending between the flanges up into the cap and having an aperture therein cut by the said piercing means.

ERNEST E. JONES.