Oct. 23, 1934. G. JOHNSON 1,978,088

METHOD OF MAKING ATTACHING MEMBERS

Original Filed July 15, 1932

Fig.1.

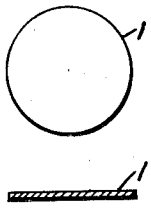


Fig.2.

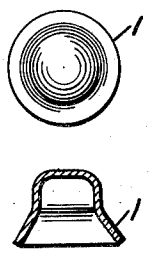


Fig.3.

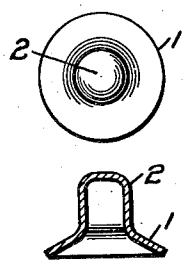


Fig.4.

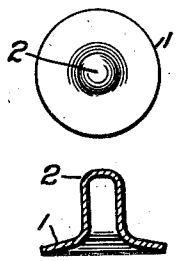


Fig.5.

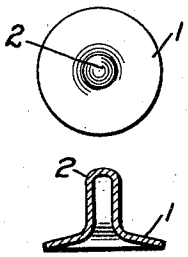


Fig.6.

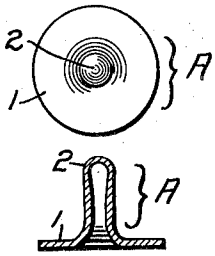


Fig.7.

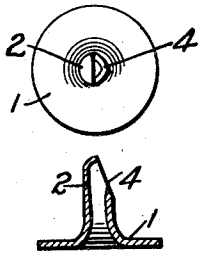


Fig.8.

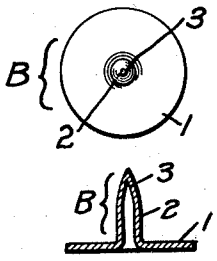


Fig.9.

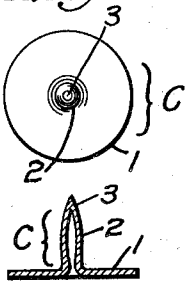


Fig.10.

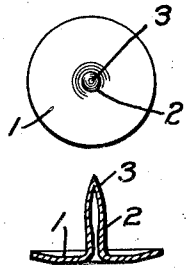


Fig.11.

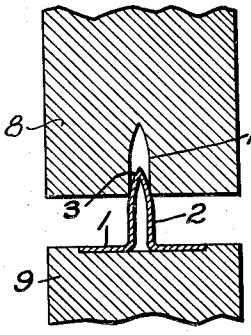


Fig.12.

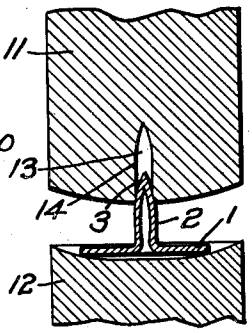


Fig.13.

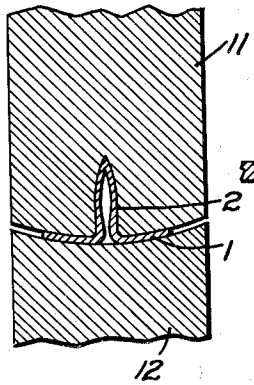


Fig.14.

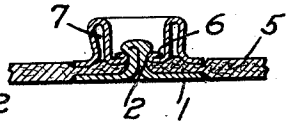
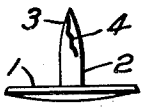


Fig.15.



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Attys

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UNITED STATES PATENT OFFICE

1,978,088

METHOD OF MAKING ATTACHING MEMBERS

Gustav Johnson, West Roxbury, Mass., assignor to United-Carr Fastener Corporation, Cambridge, Mass., a corporation of Massachusetts

Original application July 15, 1932, Serial No. 622,605. Divided and this application December 7, 1932, Serial No. 646,125

3 Claims. (Cl. 10—27)

My invention aims to provide improvements in the method of making attaching members for use in attaching buttons, snap fastener elements and the like to their carrying mediums.

This is a division of my co-pending application Serial No. 622,605, filed July 15, 1932.

In the drawing, which illustrates a preferred embodiment of my invention:—

Figures 1 through 10 each show a plan and a cross-section of a blank showing the successive steps of forming my device from a flat disk to a complete sharp pointed, reinforced shank;

Fig. 11 is a sectional view showing portions of dies and an attaching member in cross-section and illustrating the manner of compressing the shank from the formation shown in Fig. 8 to the formation shown in Fig. 9;

Fig. 12 is a view similar to that shown in Fig. 11, but showing other dies for compressing the shank from the formation shown in Fig. 9 to the formation shown in Fig. 10 and shows the beginning of the operation of the dies;

Fig. 13 is a section of the part shown in Fig. 12 but showing the completed operation of the dies and the increased thickness of the shank caused by the compressing operation;

Fig. 14 is a section through a fastener installation showing one use of my attaching member; and

Fig. 15 is a side elevation of a completed attaching member.

Referring to the embodiment of my invention selected for purposes of illustration, there is shown a rivet or tack formed from a single piece of sheet metal and having a base 1 from which is pressed a shank 2 having a sharp point 3. The tack may be made by passing a piece of suitable metal beneath a series of dies in a step-by-step manner, as will be understood by anyone skilled in the art from an inspection of the figures of the drawing. The attaching member, as well as the method of forming it after the opening in the end of the shank is closed, is an improvement over that shown in the application to Gustav Johnson, Serial No. 430,366, filed February 21, 1930, and the divisional of that application, Serial No. 494,031, filed March 7, 1930.

As pointed out in the applications referred to above, the first steps of making my improved device are obvious to those skilled in the art and the improvements covered by those applications relate to the idea of cutting away a portion of the blunt end of the shank 2, as shown in Fig. 7, and thereafter pointing the apertured blunt end. That important feature was accomplished by compressing the tack shank 2, as shown in Fig. 7, between a pair of male and female dies, thereby closing the aperture 4 and forming the sharp tapered point 3 (Fig. 8) having a substantially smooth continuous surface. The removal of a portion of the blunt end was for the purpose of permitting the remaining portion to be easily formed into a sharp pointed non-wrinkled portion of substantial length which could be readily upset for riveting purposes.

I have found that an improved attaching member may be made by providing the shank of the attaching member with a wall which is of greater thickness adjacent to the base 1 than adjacent to the free end. Therefore, my invention as disclosed by the annexed drawing is for an improved rivet or tack having a portion of the shank made thicker and the method of accomplishing the desired result. By increasing the thickness of the wall of the shank for a portion of its length adjacent to the base, that portion of the shank including the pointed portion above the thickened portion may be more easily upset and much more neatly riveted. Also by strengthening the lower end portion of the shank there is an assurance that the shank will be riveted properly without any substantial distortion of that portion of the shank which passes through the carrying medium 5 (Fig. 14) and the portion 6 of the part 7 to be attached. In other words, the upper end of the shank is bound to be distorted laterally and substantially symmetrically during the riveting operation and no telescoping of the bottom portion can take place since besides the wall being thickened there is substantially no space surrounded by the wall.

Referring now to the particular method of forming my improved rivet or tack after the blunt end of the blank A (Fig. 6) has been cut away (Fig. 7) and then pressed between dies to form a sharp pointed end, as shown in Fig. 9, the steps are as follows. The blank B, Fig. 8, is placed between opposed dies 8 and 9 (Fig. 11) which are moved toward each other in any suitable manner. The die 8 is provided with a bored cylinder for a portion of its length and tapered to a point throughout the remainder of its length. The diameter of the cylindrical portion is such that the wall 10 surrounding it will pass over the greater portion of the pointed portion 3 before engaging the shank 2 of the tack, as clearly illustrated in Fig. 11. Therefore, when the dies are moved together the shank of the attaching member below the sharp pointed portion is reduced to a smaller diameter, as shown in Fig. 9, without to any great extent

disturbing the contour of the tapered end and without, to any extent, changing the length of the completed shank over that shown in Fig. 11. The next blank C (Fig. 9) is placed between dies 11 and 12 (Fig. 12) which further reduces the shank 2. The die member 11 has a bore 13 which is similar to the one formed in the die 8 except that it is smaller in diameter and the wall 14 surrounding the bore 13 passes over substantially all of the pointed portion 3 of the shank before engaging the shank in the same manner as described in connection with the previous step. During both of these operations just described, the shank below the pointed portion is reduced in diameter (Figs. 9 and 10) without, to any great degree, lengthening the shank. Therefore, the wall of the shank below the pointed portion and near the base is thickened by the metal being compressed. It should be understood that, while I have shown two operations for accomplishing the desired thickening or the shank, any number of operations may be used and any suitable method employed while coming within the scope of my improved construction.

The advantage of my improved method is in the fact that I can form a shank of an attaching element which is stronger than that described and disclosed in my application previously referred to while accomplishing the desired result by a method which is impossible by step by step use of male and female dies. Therefore during the formation of the device beginning with the blank which is shown in Fig. 5, I provide a shank which is thicker in that portion nearest the base than that portion at the end. This result is accomplished in the first one or more steps by drawing out the end of the shank during the lengthening process. During that part of the process which takes place after the shank has been pointed, and as illustrated in Figs. 9 through 12, the shank diameter decreases and thus substantially closes the shank adjacent to the base as shown in Fig. 10. During these steps in the process no male die can be entered into the shank nor is one necessary to accomplish the desired result.

My improved fastener member provides a self-piercing tack-like device which is simple in construction, inexpensive to manufacture. It is adapted to be used very efficiently as a rivet in an automatic attaching machine, since it finds its own way into proper engagement with a part to be attached and may be easily and efficiently riveted, because of the relatively weak point as compared to the strengthened shank especially adjacent to the base.

While I have illustrated and described a preferred embodiment of my invention, I do not wish to be limited thereby, because the scope of my invention is best defined by the following claims.

I claim:

1. The method of forming an attaching member in the form of a tack having a base, a shank and a sharp point on the end of the shank, which comprises pressing a hollow, blunt end shank from a sheet metal blank, cutting away a portion of the blunt end of the shank, forming the remainder of the material of said shank adjacent to the cut end into a sharp point and thereafter compressing the shank to increase the thickness for a portion thereof adjacent to the base only.

2. The method of forming a sheet metal tack having a base, a shank and a sharp point on the end of the shank, which comprises pressing a hollow substantially rounded end shank from a sheet metal blank, cutting away a portion of the shank adjacent to the rounded end, pressing the rounded end of the shank into a suitable die by longitudinal approaching movement of one toward the other to compress the rounded end of the shank and form a sharp pointed portion and thereafter reducing the diameter of the shank throughout its length below the pointed end to substantially close it adjacent to the base thereby increasing the strength of the shank portion below the pointed portion without to any extent changing the length of the shank after pointing.

3. The method of forming an attaching member of the class described having a base and a shank, which comprises pressing a hollow shank from a sheet metal blank and thereafter reducing the diameter of the shank adjacent to the base only by forcing it into a female die thereby substantially to close the shank adjacent to the base to strengthen it near the base only.

GUSTAV JOHNSON.