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J. PÜSCHNER ET AL

2,242,794

METHOD OF PRODUCING SEPARABLE FASTENERS

Filed Jan. 28, 1938

Fig. 1

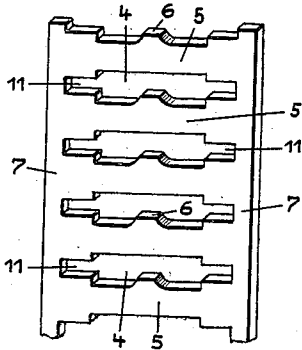


Fig. 2

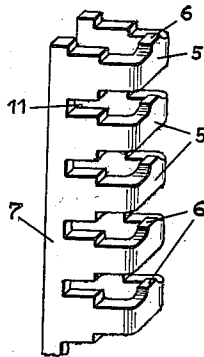


Fig. 3

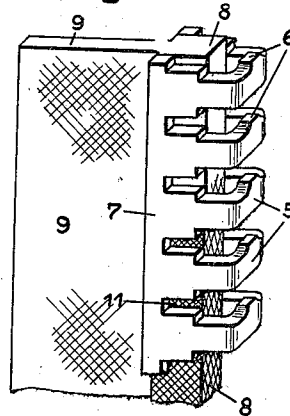


Fig. 4

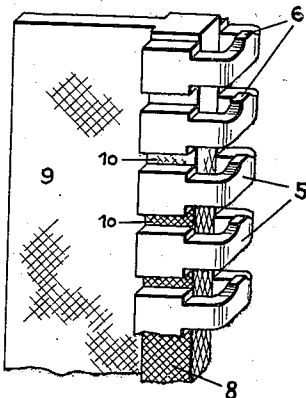


Fig. 5

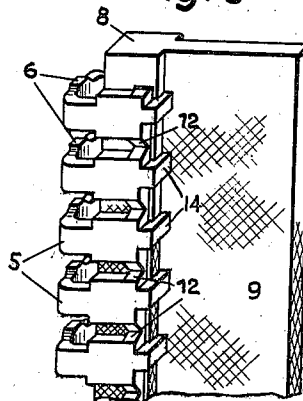
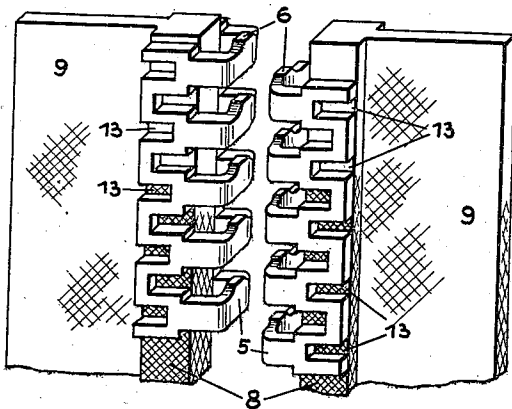


Fig. 6



INVENTORS:
JULIUS PÜSCHNER
JOSEF PÜSCHNER
BY *Maxwell E. Sparrow*
ATTORNEY

UNITED STATES PATENT OFFICE

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METHOD OF PRODUCING SEPARABLE
FASTENERSJulius Püschner and Josef Püschner,
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7 Claims. (Cl. 13—59)

This invention relates to a method of producing separable fasteners, and has for its object to reduce the cost of production of these fasteners to a considerable degree and to simplify manufacture in such manner that only a few tools are required which can be made at relatively low cost.

The object of the invention is substantially attained by forming first a ladder-like structure of U-shaped cross section the steps or cross members of which are spaced from one another at a distance somewhat in excess of the width of a cross member and provided with a nose-like projection in the center of one edge. This ladder-like structure is placed on the band or stringer so that a hollow space remains between the structure and the stringer and is then secured with its edges to the band. The cross members of the ladder-like structure are bent in U-fashion and form the fastening elements. To provide for relative mobility of the fastening elements the edges of the ladder-like structure are cut up or indented to permit the cross members secured to the band and serving as fastening elements to follow the bending of the band.

The ladder-like structure from which the method proceeds may consist of any suitable material. It is preferably made by converting a flat strip of the material of which the elements of the fastener are to consist into a ladder-like form by equidistantly punching out windows and then bending the strip about its central longitudinal axis into U-shape. It is of course also possible to produce the structure of U-shaped cross section directly by the die casting process or by pressing if artificial resin is used as material.

The method according to the invention is particularly advantageous for producing separable fasteners having elements of non-metallic, rigid material which can be worked when heated, such as Celluloid. The manufacture of such fasteners was hitherto extraordinarily bothersome and expensive.

By way of example, the invention is illustrated in the accompanying drawing, in which Figure 1 shows a strip converted into ladder-like shape by punching according with the first step of the method; Fig. 2 shows the ladder-like strip shown in Fig. 1 bent into U-shape, which is the second step of the method; Fig. 3 shows as third step of the method how the U-shaped strip of Fig. 2 is placed on a stringer so that an intermediate space remains and is secured thereto; Fig. 4 indicates how greater flexibility is attained by

removing the portion of the edge of the U-shaped strip located between the steps of the ladder-like structure; Fig. 5 is a modification of a separable fastener, in which the edges between the steps are weakened only by notches; and Fig. 6 is a view of another modification, in which greater flexibility of the ladder-like structure is produced by indentations provided on a level with the steps.

In carrying out the method according to the invention we proceed from a flat strip preferably consisting of a non-metallic rigid material that can be deformed when heated, such as Celluloid. By punching out the windows 4 this strip is converted into a uniform ladder-like structure possessing the steps or cross members 5 and the edges 7, as shown in Fig. 1. The steps 5 are provided in the center of one edge with noses 6. The space between two successive steps 5 is somewhat larger than the width of a step 5 except at the noses 6 where the space amounts to less than the width of a step.

In further accordance with the invention the stamped ladder-like structure is bent about its central longitudinal axis into U-shape, as indicated in Fig. 2, after the material has preferably been heated to make it workable. The bent structure is placed on the thickened edge 8 of the band 9, but only so far that a hollow space remains between the edge of the band 9 and the vertex of the U-shaped structure, as indicated in Figs. 3 to 6. The bent steps 5 project therefore beyond the edge of the band 9 in the form of a bow, and the U-shaped piece embracing the band 9 is cemented with its edges 7 to the band in known manner. Owing to the elasticity of the material, such as Celluloid, from which the ladder-like structure is made, the band with the U-shaped structure attached thereto possesses flexibility in various directions.

The U-shaped steps 5 of the U-shaped structure attached to the band 9 serve as fastening members of the separable fastener to be produced.

The completed fastener comprises of course two bands which face each other with the edges supporting the U-shaped ladder-like structure. For connecting the two bands the steps or cross members 5 serving as fastening elements are somewhat spread apart by means of a slide member sliding on both bands, so that always one cross member of one band can be inserted in the space between two cross members of the other band. When the spreading action ceases after the members 5 of both bands are in en-

gagement with one another, the nose 6 of each member 5 of one band enters the bow of the adjacent member 5 of the other band, whereby mutual locking is effected. A separable fastener of this type is relatively rigid, which is desirable for many purposes. Flexibility can be increased by providing the ladder-like structure with marginal indentations 13 on a level with the members 5, as shown in Fig. 6. Instead of indentations 13 notches 12 may be provided in the edges 7 between the members 5. It is further possible completely to remove the portion of the edges 7 disposed between the members 5 after the ladder-like structure has been secured to the band either by cutting or by applying hot stamps, as indicated in Fig. 4. As Celluloid is easily workable, particularly under heat, these spaces between the steps of the ladder-like structure can be produced by cutting, stamping, etc. without damaging the band. Furthermore, this subsequent treatment does not interfere with proper seating of the cross members 5 serving as fastening elements on the band, as the treatment occurs at places to which the ladder-like structure is cemented with its edge. If the ladder-like structure is made of metal, artificial resin, etc. the portions thereof at which the edges are to be separated later on are preferably provided during the punching operation with weakening notches, as shown 12 in Fig. 5. To increase the hold of the fastening elements 5 on the band cramps 14 (Fig. 5) engaging the thickened edge of the latter from the rear may be provided.

We claim:

1. A method of producing slide fasteners and securing the same to a tape, band or like carrier, which consists in so perforating an elongated strip of formable material intermediate the marginal edges only thereof as to provide transversely elongated perforations, each having a nose-like projection extending from one wall of each perforation intermediate the lateral ends thereof and in the plane of said strip and leaving a web at each marginal edge whereby the strip form is maintained, bending said strip about said nose-like projections into a substantially U-shaped strip and thus providing a plurality of cross-members and a nose-like engaging element on each of said cross-members, fastening said marginal edges of said strip to said carrier, and weakening said webs by forming therein recesses in staggered relation so as to provide one series of indentations having their openings directed toward said carrier and another series of indentations having their openings directed toward said perforations.

2. A method of producing slide fasteners and securing the same to a tape, band, or like carrier, which consists in so perforating a flat and elongated strip of formable material between the marginal edges only thereof as to provide successive and equidistant perforations of predetermined shape with a nose-like projection extending from one wall of each perforation intermediate the ends thereof and in the plane of said strip and leaving a marginal web along each marginal edge of said strip, bending said strip about the longitudinal center line thereof into a substantially U-shaped strip with said nose-like projections arranged at said center line, fastening said marginal webs to said carrier, and weakening said webs by forming notches therein.

3. A method of producing slide fasteners and securing the same to a tape, band, or like car-

rier, which consists in so perforating an elongated strip of formable material intermediate the marginal edges only thereof as to provide transversely elongated perforations leaving a web at each marginal edge of said strip and with a nose-like projection extending from one wall of each perforation intermediate the lateral ends thereof and in the plane of said strip whereby the strip form is maintained, bending said strip about said nose-like projections into a substantially U-shaped strip as to provide a plurality of cross-members between each two adjacent perforations with said nose-like projection on each of said cross-members, and fastening said webs to said carrier.

4. A method of producing slide fasteners and securing the same to a tape, band, or like carrier, which consists in so perforating a flat and elongated strip of formable material intermediate the marginal edges only thereof as to provide successive and equidistant perforations of predetermined shape leaving a web along each marginal edge of said strip and having each a nose-like projection arranged at one wall thereof at the longitudinal center line and in the plane of said strip whereby the strip form is maintained, bending said strip about said longitudinal center line into a substantially U-shaped strip, fastening said webs to said carrier, and severing said strip at its marginal edges by forming therein cut-outs substantially in alignment with said perforations.

5. A method of producing slide fasteners and securing the same to a tape, band, or like carrier, which consists in so perforating an elongated strip of formable material intermediate the marginal edges only thereof as to provide transversely elongated perforations leaving a web at each marginal edge of said strip and with a nose-like projection extending from one longitudinal wall of each perforation and in the plane of said strip whereby the strip form is maintained, bending said strip about said nose-like projections into a substantially U-shaped strip as to provide a plurality of cross-members between each two adjacent perforations with said nose-like projection on each of said cross-members, and fastening said webs to said carrier with said nose-like projections in spaced relation from the adjacent forward edge of said carrier.

6. A method of producing slide fasteners and securing the same to a tape, band, or like carrier, which consists in so perforating a flat and elongated strip of formable material between the marginal edges only thereof as to provide successive and equidistant perforations of predetermined shape with a nose-like projection extending from one wall of each perforation intermediate the ends thereof and in the plane of said strip and leaving a marginal web along each marginal edge of said strip, bending said strip about the longitudinal center line thereof into a substantially U-shaped strip with said nose-like projections arranged at said center line, disposing said nose-like projections in spaced relation from the forward edge of said carrier, fastening said marginal webs to said carrier, and weakening said webs by forming notches therein.

7. A method of producing slide fasteners and securing the same to a tape, band, or like carrier, which consists in so perforating a flat and elongated strip of formable material intermediate the marginal edges only thereof as to provide successive and equidistant perforations of predetermined shape leaving a web along each mar-

ginal edge of said strip and having each a nose-like projection arranged at one wall thereof at the longitudinal center line and in the plane of said strip whereby the strip form is maintained, bending said strip about said longitudinal center line into a substantially U-shaped strip, disposing said nose-like projections in spaced relation from

the forward edge of said carrier, fastening said webs to said carrier, and severing said strip at its marginal edges by forming therein cut-outs substantially in alignment with said perforations.

JULIUS PÜSCHNER.
JOSEF PÜSCHNER.