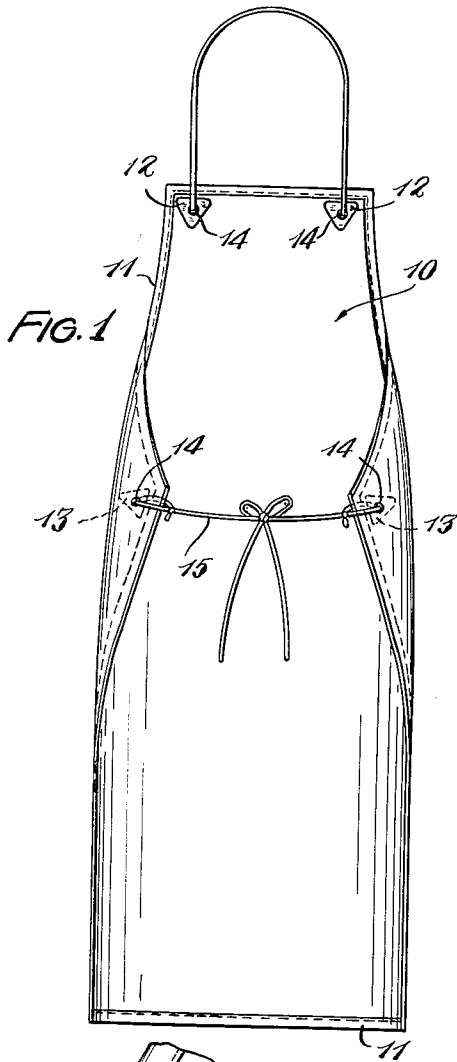
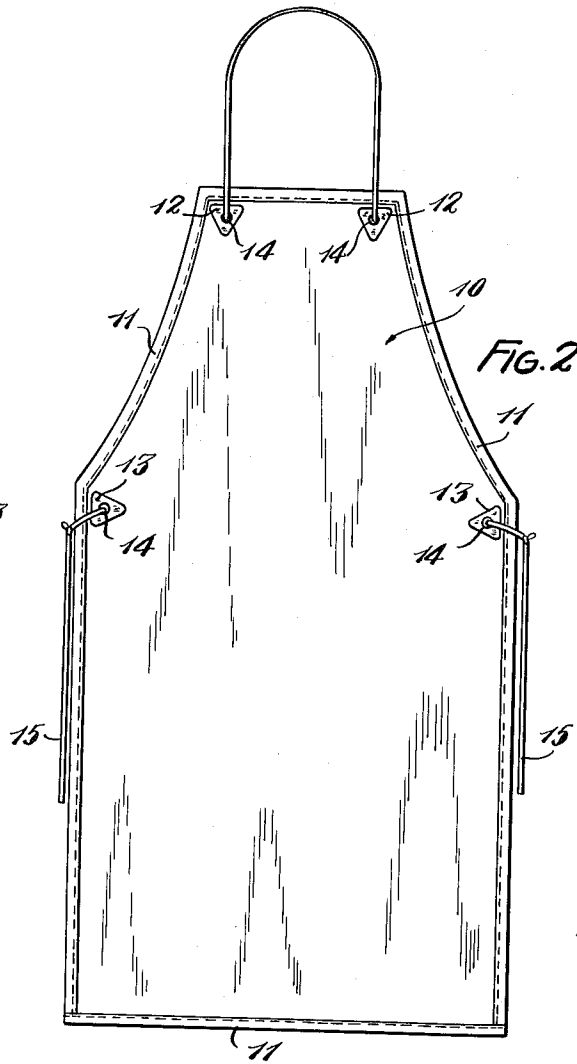
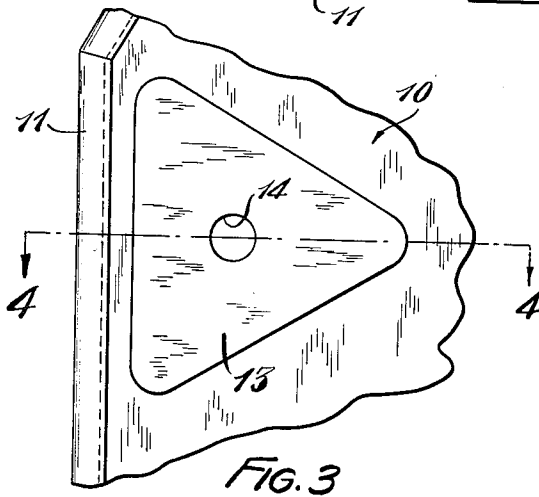
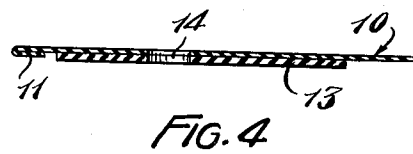


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B. J. STARKOFF
REINFORCED APRON
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2,740,123



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2,740,123

REINFORCED APRON

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2 Claims. (Cl. 2—51)

This invention relates to reinforcing eyelets, and more particularly to non-metallic plastic eyelets, adapted to form a supporting means for an apron tie or string or the like at the point of attachment to the apron.

The inventive thought of this disclosure arose from solving the problem of developing a satisfactory apron string, or tie supporting means in a plastic acid-resisting laboratory apron to replace conventional metal grommets, which were found to be unsatisfactory due to the manner in which they distribute the tearing or shearing strains of the string or tie of an apron at the point of their attachment to the apron. Aprons of the type disclosed frequently are made of such plastic materials as polyvinyl chloride, or other suitable materials.

Various types of reinforcing eyelets were tried, the various types being tested for the amount of pull strain they would withstand. These tests demonstrated that a tie or string on a plastic apron having circular metal grommets or eyelets supporting the tie would tear or shear off upon application of a pulling strain on the order of 2½ to 4½ lbs.

It is believed that the success of the triangularly shaped eyelet disclosed herein, is due primarily to the reduction of stress concentrations. The fact that it will sustain greater loads than the circular metal grommet, without rupturing the apron is believed due in part to the fact that, whereas the metal grommet permits strains to be transferred through the metal edge, due to its higher modulus of rigidity it cannot promote uniform stress distribution in the apron. The use of the disclosed triangularly shaped eyelet permits strains to be transferred directly from the tie to the apron.

Various shapes and sizes of reinforcing tie-supporting eyelets of the same material as the apron were then tried. It was found by similar tests that the greatest resistance to pulling or shearing was obtained by using plastic eyelets of triangular form, preferably of the same material and of greater thickness than the plastic apron, disposed with one side of the triangle substantially at right angles to the general direction of the pull of the apron string. Eyelets thus disposed were found to withstand a pull up to 20 to 22¾ lbs. while grommets of even a heavier gauge withstood a pull up to 27¼ lbs.

Therefore, an object of this invention is to provide reinforcing grommets or eyelets, which due to their disposition and arrangement will withstand all normal pulling strains to which apron ties will be subjected in a laboratory, or the like.

Other objects are to provide reinforcing eyelets, formed of the same material as the apron, which may be quickly and easily secured thereto by heat sealing or like operations at a relatively low cost, such eyelets being strong and durable in use, attractive in appearance, and serving to prevent tearing of the apron by ties at the point of contact with the apron.

Other and further objects of this invention will appear in the course of the following specification.

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In the drawings forming a part of this specification:

Fig. 1 is a rear view of a plastic apron using my plastic reinforcing eyelets illustrating the arrangement of the apron when worn on the body of a person;

Fig. 2 is a front view of an apron when not being worn;

Fig. 3 is an enlarged fragmentary view of a portion of the apron at the point the reinforcing eyelet is secured thereto; while

Fig. 4 is a section taken in the line 4—4 of Fig. 3. In the drawings the numeral 10 refers to a plastic apron adapted for laboratory use, formed of polyvinyl chloride plastic or other suitable material, having a marginal hem 11 and provided with four reinforcing eyelets, the two at the top of the apron being designated by the numeral 12 while the two at the sides are indicated by the numeral 13. These eyelets 12 and 13 formed of equilateral triangular shape and having central apertures 14 matching similar apertures in the plastic apron 10, are positioned and arranged as illustrated in Fig. 1 with one margin of the triangular 12 disposed at substantially right angles to the upward pull. Likewise the eyelets 12 have one margin disposed at right angles to the substantially horizontal pull of the apron tie 15 on the apron 10, as it is disposed on the body of the wearer.

The eyelets 12 and 13 preferably formed of the same material and of heavier gauge than the apron 10, may be secured to the plastic apron by an electronic sealing means or other satisfactory means and have been found to withstand pulling strains up to 22¾ lbs. Even higher resistance to pulling strains on the order of 27 lbs. may be provided by using extra heavy gauge eyelets, if required for certain purposes. For most aprons it is not necessary to use such extra heavy gauge eyelets, as aprons normally would not be subjected to strains of this order.

Increasing the effective plastic thickness around the eyelet aperture, is believed to contribute materially to the reduction of localized tearing or shearing strains caused by the folding action of the tension tie on the edges of the aperture. In wearing the apron it has been readily observed that the principal strains, manifested by wrinkles, are generally in a direction normally perpendicular to the edge of the eyelet.

It is believed that increasing the effective plastic thickness around the tie-receiving hole contributes materially to the reduction of localized tearing or shearing strain caused by the folding action of the tensioned tie on the edge of the hole. Also, it is thought that the strains transferred from the thicker plastic reinforcement eyelets to the thinner portion of the apron are appreciably reduced because of a relatively large perimeter edge which is approximately ¾ of the perimeter of the triangular eyelets.

My invention is adapted to many uses in addition to that disclosed and such uses are within the contemplated scope of the invention.

It will be apparent to those skilled in the art that the embodiment of the invention disclosed herein may be variously changed, used or modified without departing from the spirit of the invention or sacrificing the advantages thereof, and that the embodiment of my invention is illustrative only and that my invention is not limited thereto.

I claim:

1. An industrial apron comprising, a body of flexible plastic material, flexible ties for securing said apron to the body of a wearer, said apron being vertically elongated and including vertical side margins, relatively large flat eyelets receiving said ties, formed of pliable plastic material bonded to the body of said apron and disposed inwardly of the top and bottom apron margins a substantial distance, said eyelets being at least of substantially equilateral triangular shape and having tie-receiving

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openings disposed centrally thereof, one side of each eyelet being disposed parallel to and in close proximity to a side margin of the apron, said eyelets extending inwardly from the side margins a substantial distance, whereby pulling strains applied to said apron ties in a generally horizontal direction at the location of said eyelets as said side margins are pulled away from each other when said ties are secured around the body of the wearer, are dispersed into the body of the apron along the two inwardly extending sides of said triangularly shaped eyelets in directions angularly of said pulling strains, for the purposes described.

2. An industrial apron comprising, a body of flexible material, ties for securing said apron to the body of a wearer, said apron being vertically elongated and comprising a rectangularly shaped lower portion and an integrally formed upper portion including upwardly and inwardly sloping side margins terminating in a horizontally disposed top margin, flat eyelets receiving said ties, formed of pliable plastic material bonded to the body of said apron, said eyelets being of equilateral triangular shape and having tie-receiving openings disposed centrally thereof, one eyelet being disposed along the outer margin of each side margin of the lower portion of said apron with one side of each eyelet disposed parallel to and in close proximity to a side margin, a pair of spaced similar eyelets adapted to receive ties encircling the neck of a wearer, disposed along the top margin of said apron,

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each top eyelet having one margin disposed parallel to and in close proximity to said top margin, all of said eyelets being of substantial size and extending inwardly from their respective side margins a substantial distance, whereby pulling strains applied to said apron ties in a generally horizontal direction at the location of said side margin eyelets as said side margins are pulled away from each other when their ties are secured around the body of the wearer, and pulling strains applied in a generally vertical direction at the location of said top margin eyelets as the top ties are wrapped around the neck of a wearer, are dispersed into the body of said apron along the two inwardly extending sides of each triangularly shaped eyelet in directions angularly of said pulling strains.

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