

Dec. 4, 1934.

R. T. DAWES

1,982,906

FASTENER

Filed Oct. 29, 1931

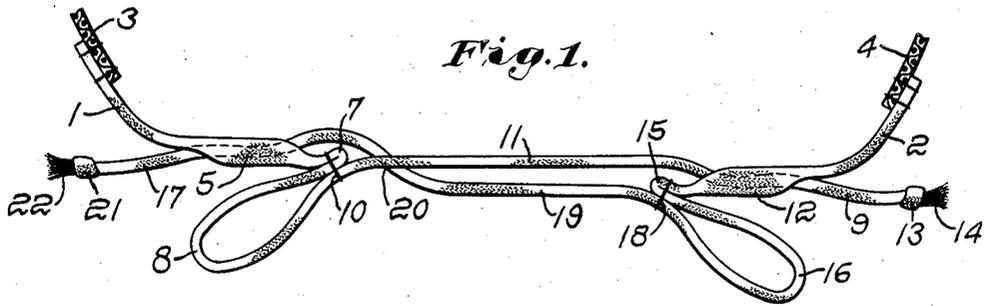


Fig. 2.

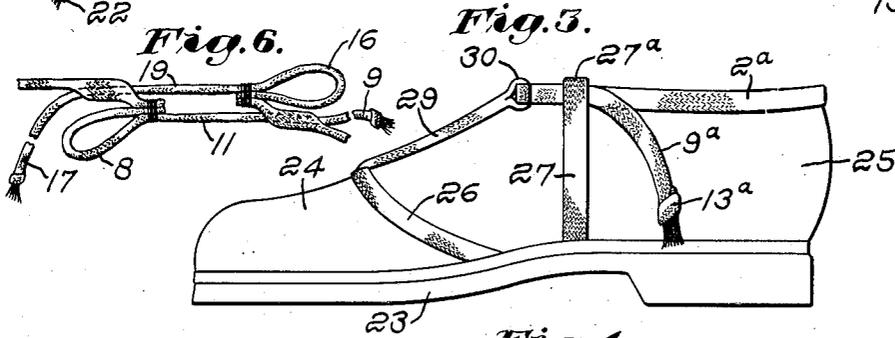
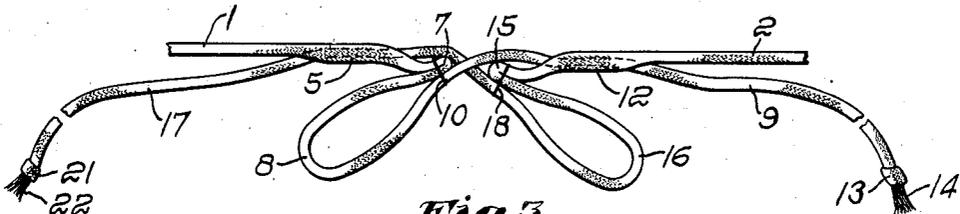


Fig. 6.

Fig. 3.

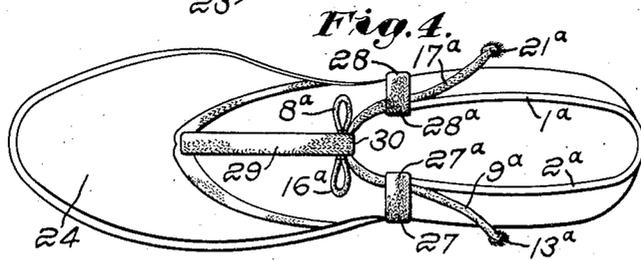


Fig. 4.

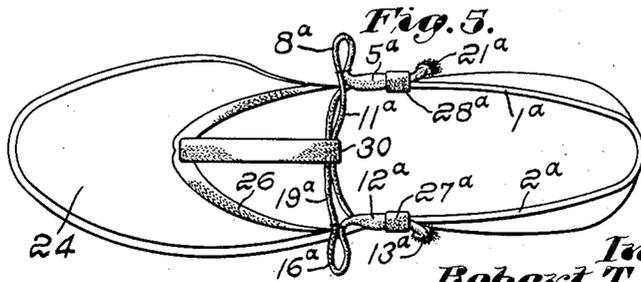


Fig. 5.

Inventor:
Robert T. Dawes,
by *Robert Cushman Woodberry,*
Attys.

UNITED STATES PATENT OFFICE

1,982,906

FASTENER

Robert T. Dawes, Hudson, Mass.

Application October 29, 1931, Serial No. 571,769

8 Claims. (Cl. 36—50)

This invention pertains to fasteners of the kind useful in adjustably constricting a gap or opening, for example in a garment, bag, belt, band, bight or other article, device or element and relates more particularly to a fastener comprising relatively movable parts which are always engaged, which may be relatively adjusted by as small amounts as desired, and which remain in adjusted position until readjusted. While of general utility for the purposes just indicated, the invention is herein specifically described and its advantages made manifest with relation to its embodiment in an article of footwear such, for example, as a shoe.

In common with many other articles of wearing apparel, shoes are usually provided with an opening having appropriate fastener means whereby the opening may be more or less constricted. While certain types of fasteners, for example, buttons, snaps, hooks or the like must usually be of metal or other hard and rigid material, sometimes having corners or edges which injure the wearer or tear his other garments, and are adapted to close the opening only to a predetermined and fixed amount, other types of fastener, for example, laces may be of soft and flexible material and permit adjustment of the opening as circumstances require. On the other hand, buttons, hooks, clasps etc. permit relatively rapid opening and closing of the gap, while laces require tightening and tying, the latter operation often being troublesome of performance by children, or in fact by anyone when the opening or gap is difficult of access to the wearer.

In accordance with the present invention I provide a constrictive closure of adjustable type which, like the usual lacing, consists of soft and flexible elements which can not injure the wearer or his other garments; which may be of any desired color;—and which in general appearance may resemble an accurately tied bow knot but which may be tightened and loosed by a simple pull in the proper direction, and whose parts remain in any position of adjustment regardless of the stress to which they may be subjected in use, and which may be used for constricting any form of bight, band or opening, all as hereinafter more fully set forth.

In the accompanying drawing I have illustrated by way of example one embodiment showing the invention as applied to a shoe of a kind commonly worn by children or used for sportwear, it being understood that this embodiment has been chosen merely as illustrative of the utility of the device and that the device in its broader

aspects is useful for constricting openings in other articles of wearing apparel as well as in devices in general having openings which are to be adjustably restricted.

In the drawing,

Fig. 1 is a plan view showing the fastener in its most expanded condition, and illustrating details of construction;

Fig. 2 is a view similar to Fig. 1, but showing the fastener in its fully contracted position;

Fig. 3 is a side elevation to smaller scale, showing a shoe having the fastener applied thereto;

Fig. 4 is a top view of the shoe shown in Fig. 3, the fastener being fully contracted;

Fig. 5 is a top view of the shoe of Fig. 3, but with the fastener fully expanded, and

Fig. 6 is a view similar to Fig. 1 but to smaller scale, showing a modified construction.

Referring to the drawing, the numerals 1 and 2 (Figs. 1 and 2) respectively indicate lengths of flexible material, either independent as specifically shown in Fig. 1 or forming opposite end portions of a bight or loop as specifically shown in Figs. 3, 4 and 5. As shown in Fig. 1 these lengths of material 1 and 2 are secured, as for example by stitching, to parts 3 and 4 which may be considered as representative of the edge portions of pieces of material defining the opposite edges of a gap or opening to be closed or constricted. The parts 3 and 4 may be independent elements or may form the free ends of a bight or band or the edges of a garment section.

The fastener herein disclosed may be considered as comprising two cooperating sections of which the parts 1 and 2 constitute the anchoring or attaching element, and these sections may be regarded if desired as the ends of a bight to be constricted. Each section may conveniently be made from a length of tubular knitted textile fabric. Thus one section comprises the attaching portion 1, which may be flattened before securing it to part 3 and the substantially cylindrical portion 5, hereinafter referred to as a gripper or tubular sleeve. Beyond the end of sleeve 5 the material is again flattened and then doubled at 7 to provide the loop portion 8 whose length is fixed by suitable fastening means, for example stitches 10. Beyond the stitches 10 this length of material is provided with the extension 11 which, after passing longitudinally through the bore of the gripper or tubular sleeve 12 of the opposite section, preferably is furnished at its free end 9 with an enlargement or stop 13, for example a knot, to prevent its retraction from the gripper sleeve 12, and be-

yond which it may have a tassel 14 or other ornamental end, if desired.

The section which embodies the part 2 may also comprise a length of tubular braided material having the above-noted gripper or tubular sleeve 12, beyond which the material is doubled at 15 to provide the loop 16 which is provided with the fastener stitches 18. Beyond this loop is the extension 19, normally substantially parallel to the extension 11 above referred to, such extension 19, in the arrangement illustrated in Fig. 1, passing transversely through an opening 20 in the part 11 at a point near but inwardly of the stitches 10. Beyond this point the extension 19 extends longitudinally through the bore of the gripper sleeve 5 of the opposite section and its free end 17 is furnished with an enlargement such as a knot 21, and with the tassel portion 22 if desired.

In making this device it is preferred, as above noted, to make use of a length of tubular braided material, for example textile material, although material not commonly referred to as textile material, for example paper, rubber or wire, may be used, and in constructing the device I prefer first to provide the loop members 8 and 16 of the opposite sections, then to pass the free end of the extension 11, for example, inwardly through an opening in the wall of the part 12, thence longitudinally of the bore of said part 12, and thence out through another opening in the side wall of the part 12, after which the knot 13 is formed. In the same way the free end of part 19 is first passed transversely through an opening at the point 20, then inwardly through an opening in the side wall of the part 5, then longitudinally of the bore of the latter part, and thence out through another opening in the side wall after which the knot 21 is formed.

It is a property of a tubular braided structure to contract very substantially in diameter when subjected to longitudinal stress and, on the other hand, to increase substantially in diameter when contracted in a lengthwise direction. While tubular braided fabric exhibits this property to a very marked degree, certain other structures consisting, like tubular braid, of two series of helically extending overlapping strands of opposite pitch exhibit similar characteristics, while other tubular textile materials show the same effect to a lesser degree, for example bias knit fabrics. Thus when in the following description and claims I refer to a gripper sleeve, gripper device, or tubular gripper, I intend to indicate a sleeve-like member, whether of braided or other construction, and/or of whatsoever material which exhibits the characteristics above referred to, namely, capability of elongating substantially and contracting greatly in diameter when subjected to small longitudinal stress so as to grip and securely hold any part fitted within it and which, when contracted longitudinally, shows a marked increase in diameter such as to release its grip upon an enclosed part.

The fastener device above described may be considered as comprising a pair of tightening pulls 9 and 17, respectively, having their ends exposed to form actuating elements for tightening the fastener, thereby constricting the opening to which it is applied, and as further comprising a pair of loosening pulls consisting of the loops 8 and 16, which, when moved in opposite directions, loosen the fastener, thereby increasing the size of the opening. As shown in Fig. 1, the fastener is in its most extended condition, and it will be noted that the gripper por-

tions 5 and 12 are contracted longitudinally and are of substantial diameter. In this condition these gripper portions exert little gripping action upon the members 19 and 11 respectively which extend longitudinally through them, but if force is applied, for example to the parts 3 and 4, tending to pull the members 5 and 12 away from each other, such action immediately elongates the parts 5 and 12, (due in part to the frictional drag exerted by the parts 19 and 11) causing the grippers to contact and grip the parts 19 and 11 respectively so firmly that relative movement of the parts is effectively prevented. When using soft textile material, this gripping effect is in many cases sufficient to hold the parts against a stress sufficient to break the fabric. On the other hand, when it is desired to loosen the fastener so that the parts 3 and 4 may be moved away from each other, it is merely sufficient to move the parts 8 and 16 in opposite directions, whereupon the force exerted on the inner ends of the respective gripper sleeves 5 and 12 causes the latter to decrease in length and increase in diameter so that the gripper sleeves may slide easily along the parts 19 and 11 respectively, thus allowing the parts 3 and 4 to be separated.

In Fig. 2 the fastener is shown in its most contracted position with the gripper members 5 and 12 elongated, as by stress applied in opposite directions to the parts 1 and 2.

In Figs. 3, 4 and 5 the improved fastener is shown as applied to a shoe comprising the sole 23, the forepart 24, and the rear part 25. The forepart is furnished with a binding 26 and the forward edge of the rear part 25 is furnished with a binding 27 at one side and binding 28 at the other side, said latter bindings preferably terminating at their upper ends in loops 27^a, 28^a, respectively. A strap 29 extends upwardly from the forward part 24 and terminates in a loop 30.

The upper edge of the rear part 25 of the shoe is finished with a binding strip, preferably extending continuously around the rear part of the shoe in the form of a bight or loop comprising the forward free portions 1^a and 2^a, respectively, which correspond to the parts 1 and 2 of the fastener device of Fig. 1. This top binding may conveniently be formed of a tubular braid, flattened and secured to the top of the shoe by stitching or otherwise, and at its forward ends extending through the loops 27^a and 28^a, respectively. Beyond these loops the ends of the binding are furnished with the gripper members 5^a and 12^a corresponding to the grippers 5 and 12 of Fig. 1 and with the loosening loops or pulls 8^a and 16^a, respectively. The substantially parallel extensions 11^a and 19^a pass through the loop 30 of the strap 29 and then through the grippers 12^a and 5^a, respectively, and are furnished at their free ends 9^a and 17^a with the stops 13^a and 21^a, respectively.

When this shoe is to be put on the foot the pull members 8^a and 16^a are moved in opposite directions to the position shown in Fig. 5, thus providing a maximum opening for the reception of the foot. When the foot has been inserted in the shoe the pulls 9^a and 17^a are pulled in opposite directions, thus constricting the top of the shoe about the foot, and when sufficiently tightened the ends are merely released, whereupon the gripping members 5^a and 12^a act to lock the parts in position until they are positively released by pull exerted on the members 8^a and 16^a. The shoe may thus be secured on

the foot by pulling the parts 9^a and 17^a and may be loosened for removal simply by pulling the parts 8^a and 16^a.

It may be noted that the fastener thus provided is devoid of any metallic parts such as might cause injury to the foot; it may be made of flexible and soft material adapted to take any desired color; it is automatic in its locking action but is readily released by a simple pull when desired; and it provides for any desired degree of adjustment of the opening without requiring the manipulation of special parts.

It is further to be noted that when the shoe is tightened about the foot, as shown in Fig. 4, the fastener has the appearance of a perfectly formed bowknot, thus giving the shoe an ornamental appearance, although the formation of such knot requires no skill upon the part of the user.

For certain purposes it is not necessary to provide a fastener having the symmetrical bow-knot appearance and thus, as shown in Fig. 6, the fastener may be constructed without passing one of the extensions through the other one as above described. As shown in Fig. 6, wherein the parts are designated by the same numerals as in Fig. 1, it will be noted that the part 19 does not pass through an opening in the part 11 before entering the sleeve 5, and while this fastener operates in the same way as that above described, its appearance is somewhat different from that of Fig. 1.

While I have hereinabove described certain materials as useful in the construction of the fastener and its utility for certain specific purposes, I wish it to be understood that it is capable of manufacture from materials of various kinds and that it is of broad utility, and that all such uses and such materials as well as variations in structural details fall within the scope of the invention as defined in the appended claims.

I claim:

1. A constricting fastener combined with a bight of material adapted to embrace a portion of the human anatomy, said fastener comprising a pair of gripper sleeves of braided material each united at one end to the material of the bight, each sleeve having an integral extension at its other end, each such extension having a looped portion of fixed length adjacent to the sleeve and constituting a loosening pull, each extension also having an elongate portion extending longitudinally through the other sleeve and constituting a tightening pull.

2. A constricting fastener combined with a member adapted to embrace a portion of the human anatomy, such fastener comprising a pair of gripper sleeves, each sleeve being constructed and arranged to decrease in diameter a substantial amount when subjected to longitudinal stress, means anchoring each sleeve at one end to said embracing member with the opposite ends of the sleeves in opposed spaced relation, an extension leading from each of said opposed ends of the respective sleeves and passing longitudinally through the other sleeve, one extension having an opening adjacent to its sleeve through which the other extension passes before entering said latter sleeve.

3. The combination with a garment having a part adapted to embrace a portion of the wearer's body, a fastener for constricting such part, said fastener comprising a pair of gripper sleeves of braided textile material, each sleeve being

anchored at one end to said garment part, each sleeve having an integral extension provided with a movable portion of fixed length adjacent to the end of the sleeve and constituting a loosening pull, and an elongate portion extending longitudinally through the other sleeve and constituting a tightening pull, each tightening pull having an enlargement forming a limiting stop, one elongate portion having an opening adjacent to its loosening pull through which the other elongate portion passes before entering its gripping sleeve.

4. An article of footwear having an angle embracing portion provided with a binding of tubular braid, said braid having gripper sleeve portions at opposite sides of said article, a loosening loop secured to the forward end of each gripper sleeve and a tightening pull extending from said end of each gripper sleeve and passing longitudinally through the bore of the other sleeve.

5. A shoe having a foot receiving opening and in combination therewith fastening means comprising a pair of tightening pull members movable in opposite directions to constrict the foot receiving opening, and means providing an elongate substantially straight passage for each of said pull members, the walls of said passages being constructed and arranged to constrict said opening when said walls are subjected to longitudinal tension whereby automatically to grip and hold said tightening pull members to prevent reverse movement thereof during use.

6. A shoe having a foot receiving opening and in combination therewith fastening means comprising a pair of tightening pull members movable in opposite directions to constrict the foot receiving opening of the shoe, and gripping means of textile material automatically operative to grip and hold the respective tightening pull members whereby to prevent reverse movement of the latter during use.

7. A shoe having a foot receiving opening and in combination therewith fastening means comprising a pair of tightening pull members of textile material movable in opposite directions to constrict the foot receiving opening, and elongate gripping sleeves which decrease in internal diameter when subjected to longitudinal tension and which increase in internal diameter when longitudinally constricted, each pull member extending through the bore of the gripping sleeve which is attached to the opposite side of the shoe whereby said pull members are gripped and held against reverse movement during use.

8. A fastening device for use with a shoe having a foot receiving opening, said fastening device comprising a pair of flexible tightening pull members each secured to one side of the shoe respectively and adapted when moved in opposite directions to constrict the foot receiving opening, a pair of flexible elongate gripping sleeves each secured to one side of the shoe, said sleeves decreasing in internal diameter when subjected to longitudinal tension and increasing in internal diameter when longitudinally constricted, each pull member extending longitudinally through the opposite sleeve, and a pair of loosening devices operative when moved in opposite directions to increase the internal diameters of said sleeves and thereby to release their grip on the respective pull members.

ROBERT T. DAWES.