April 26, 1932. W. WINBERG 1,855,272

SEPARABLE FASTENER OR CLOSURE DEVICE

Filed Dec. 8, 1928

Fig. 1.

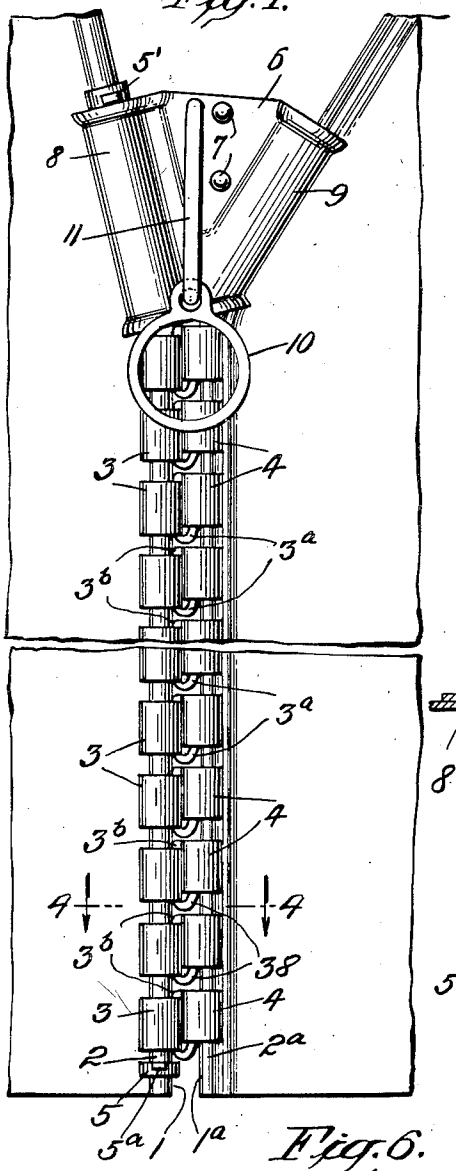


Fig. 2.

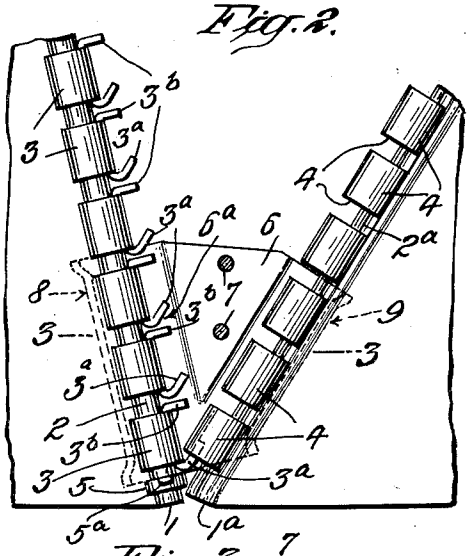


Fig. 3.

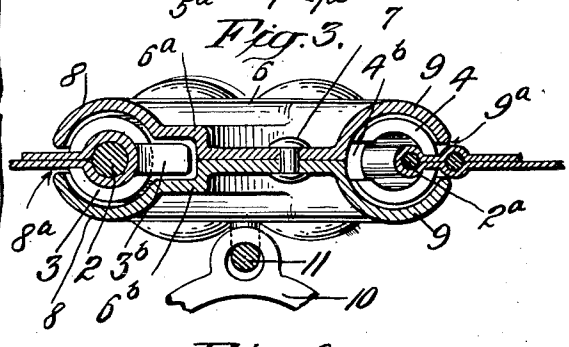


Fig. 4.

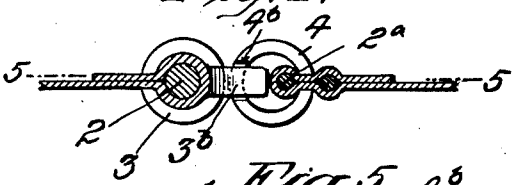


Fig. 5.

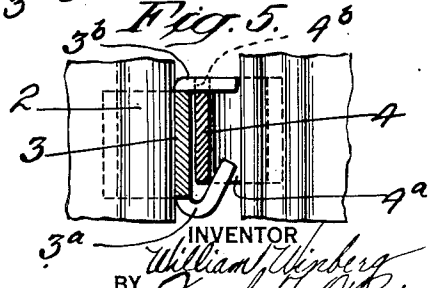


Fig. 6.

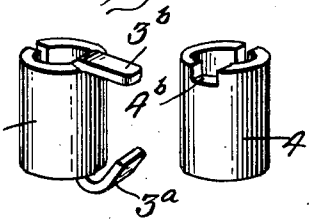
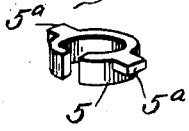


Fig. 7.



INVENTOR
William Winberg
BY Joseph F. O'Brien
Edith
ATTORNEY

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UNITED STATES PATENT OFFICE

WILLIAM WINBERG, OF EAST ELMHURST, NEW YORK

SEPARABLE FASTENER OR CLOSURE DEVICE

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This invention relates to improvements in separable fasteners or closure devices for the edges of garments and other purposes in which the edges or stringers connected thereto carry opposed locking members of the fastening device and are locked and unlocked by a sliding element engageable with both of said members, the locking being effected by movement of the sliding element in one direction and the unlocking by a sliding movement in the opposite direction.

One of the objects of this invention is to enable the facile and complete separation of the edges of an article carrying locking members of this type.

Another object of my invention is to provide a separable fastener or closure device of the type specified in which each pair of locking members constitute a complete fastening unit, independent of the adjacent members above and below the same.

Another object of my invention is to provide a device in which one member of each pair constitutes a double-pronged member comprising a primary prong in the form of a hook operable to engage by a relative longitudinal movement while the locking members are in angular position and a secondary prong operable when the members assume parallel positions to lock the same within the hook and against longitudinal movement, and this secondary prong preferably during the movement from inclined to parallel position engages a notch in the socketed member to prevent excessive relative turning movement of the members of a pair of locking members.

Still another object of my invention is to provide a device in which the sliding member is permanently fastened to one edge or stringer and the opposite edge is readily separable and removable therefrom by a longitudinal movement through the sliding member, preferably in an upward direction.

Still another object of my invention is to provide a fastening or closure device of the type specified in which the members on one edge will, in the operation of fastening and releasing, be retained in a substantially straight line and the members on the other edge will be guided through a considerable arc in their movement into and out of contact therewith, the closing and releasing preferably being accomplished by a bending movement through the medium of a sliding cam.

Still another object of my invention is to provide a better and more secure gripping connection between the opposing fastening elements and a connection which will not open up until each pair has been acted upon by the sliding member.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and cooperate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:—

Fig. 1 is a perspective view on an enlarged scale of a fragment of garment showing a fastener or closure device, embodying my invention, applied thereto, the parts being shown in locked position;

Fig. 2 is a view similar to Fig. 1, showing a slide in longitudinal section and the opposing members in unlocked position;

Fig. 3 is a section on the line 3—3 of Fig 2;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a section substantially on the line 5—5 of Fig. 4;

Fig. 6 is a view, in perspective, of the opposing fastening members employed by me; and

Fig. 7 is a view, in perspective, of the slide-stop or limiting member preferably employed by me.

Referring now to these drawings, which illustrate a preferred embodiment of my invention, 1, 1^a indicate the edges of the garment which it is desired to secure by fasteners. These edges are preferably provided with braided or twisted cords 2, 2^a so as to form a substantially cylindrical edge portion. The fastener members may, if desired, be applied on the usual stringers or tapes or in

some cases may be applied directly on the edge of the garment.

In the conventional fastening-device stringers, however, the ends are usually connected together or both edges are provided with slide portions or members, while in my device the edges of the garment or stringers will be completely and readily separable from each other when unlocked as hereinafter described.

3 and 4 indicate a pair of locking members, the fastening or interlocking of which cause a fastening of the edges 1, 1^a together and the opening of which permits the complete separation of these edges.

In the preferred form of my invention illustrated, the locking members 3 are strung on one edge of the garment and the locking members 4 are strung on the opposite edge.

Each of the members 3 is provided at its lower end with a primary engaging element comprising an upwardly-disposed engaging prong or hook 3^a and the socketed member 4 is provided with a channel 4^a into which the hook 3^a is adapted to enter when in locking engagement. The hook and socket of parts are adapted to engage upon a slight relative longitudinal movement when the locking members are disposed in relative angular relationship and, as shown, are caused to engage upon such slight longitudinal movement when the socketed member is inclined and the hooked member is maintained in substantially normal position.

The upper end of the member 3 is provided with a secondary engaging element or prong 3^b which is caused to engage during the subsequent relative movement of the locking members and is fully operative when the locking members are moved into parallel position to lock the said members against longitudinal movement and thus to lock the two members in hooked relationship. Said prong 3^b is preferably adapted to engage in the notch 4^b and thus also to prevent excessive relative turning of the said two locking members 3 and 4.

The stringing edge for the members 3 is provided with a stop 5 in no way connected with the opposite edge and a similar stop 5′ may, if desired, be provided at the opposite end of the row or string of the members 3.

In the preferred form of my invention illustrated, I provide a slide 6 which is preferably permanently connected to the row or string of the members 3 and is detachable from the edge 1^a containing the members 4. In the preferred form of my invention illustrated, the member 6 is formed in two parts 6^a, 6^b fastened together by rivets 7. The slide 6 is provided with channels or sleeves 8 and 9 respectively for the opposite rows of fastening or locking members, the channel 8 being for the hooked members 3 and the channel 9 for the socketed members 4. As illustrated, the slide is open at its outer edges 8^a, 9^a to receive the fabric and the channels 8 and 9 fit closely over the members 3 and 4 respectively so as to snugly enclose the same. The channels 8 and 9 are arranged in inclined relationship, being separated at the upper ends and meeting at their lower ends to guide the locking members into contact in proper relative positions first to cause tilting of one member and a primary hooking or engagement by the hook 3^a while in inclined position and secondly, to bring the members into parallel position and upon such movement to cause a secondary engagement or locking by the prong 3^b thus locking the members against longitudinal movement and in hooked relationship. The channels also guide the prong 3^b so that it will be inserted into the notch 4^b in the socketed member to prevent turning movement.

In order to cause the slide to be fastened permanently to one edge, the stops 5 are fastened to this edge and have outwardly-extending lugs 5^a, 5^b which are wider than the diameter of the channel 8 and prevent further longitudinal movement of the slide over the same, thus maintaining the slide permanently attached to one edge. The opposite side edge, however, is free from any stop device, and the row or string of members when the members are unhooked or unlocked may be moved freely therethrough so as to cause a complete detachment of the edges from each other.

In the preferred embodiment of my invention illustrated, each pair of fasteners is independent of fastening elements above and below the same and the hook members are all preferably disposed along one edge, while the socket members are disposed along the opposite edge. It is, therefore, necessary in accordance with this embodiment of my invention that the edge containing the sockets be bent at a greater angle than the opposite edge containing the hooks and for this reason the cam channel and the slide for the socket members is disposed at a considerable angle to the perpendicular, while the opposite edge is substantially parallel to the perpendicular. The sliding movement, therefore, of this cam slide will bend the edge with the sockets to a much greater extent than the opposite groove or sleeve will bend the edge with the hooks. Furthermore, to procure separation of the edges of the article having the locking elements it is necessary to provide for a relative longitudinal movement of the edge containing the sockets upwardly through the cam channel, because as the hooks are disposed upwardly it is, in said embodiment of my invention, necessary in order to procure a complete disengagement that one edge shall contain all the hooks and that the other shall have all the sockets and that the edge having the sockets be

moved upwardly out of engagement from the last hook within the channel in the slide. Also, when the edges 1, 1ª are to be fastened together, the edge containing the sockets will be moved downwardly through the socket channel in the slide so that the lowest socket will engage the lowest hook, after which a movement of the slide in the conventional manner will cause an engagement or interlocking of the rows with each other and a fastening together of the said edges.

In order to procure an automatic locking connection between the members of a pair of such locking members, it is necessary that such members be properly aligned opposite to each other. This alignment is provided by my sliding cam device. This alignment is also important when, after a separation, the edges are brought together for fastening. It is necessary in this case to limit and control the sliding movement of the sliding cam device to retain the same in proper position so that the meeting channel portions of said cam device will be positioned in proper relationship to the lowermost member of a locking pair. To accomplish this object, the lower stop member 5 is so arranged in relation to the lower edge of the slide as to cause the lowermost hooked member of a pair to assume its proper position in the channel 8 to engage the lowermost socketed member on the opposite edge when a row of such socketed members on such opposite edge is moved longitudinally through the opposite channel 9 of said slide device.

It will be seen that the slide being retained by the stop 5 in its proper relationship to a hooked locking member, a socketed member passing through the other channel will, while held in inclined position, automatically engage with a hooked member; that upward relative movement of the slide to the edge will cause a straightening up of the socketed member, the upper edge of which will then be engaged by a straight locking prong of the pronged member and held against relative longitudinal movement. This straight locking prong engaging within the notch 4ᵇ also prevents relative turning movement of the pair of locking members, and also that further upward movement of the slide will cause similar automatic engagement between the other pairs.

It will be apparent from the above that in my fastener or closure device, each pair of locking members will constiute a complete fastening unit and each pair will be hooked up and locked against relative longitudinal and turning movements independently of the adjacent units above and below the same. It will, furthermore, be apparent that each pair of units, having, when in parallel alignment, an interlocking hooking connection at one end and a locking engagment against longitudinal movement at the opposite end will provide a series of independent pairs of locking members which are not interdependent and cannot therefore be opened up unless each of the same is acted upon independently by the sliding cam device.

Any suitable handle may be provided for the slide 6 and, as shown, I have provided a slidable ring 10 arranged on longitudinal bail 11 so that movement of the ring along said bail will enable the pull to be exerted at the opposite ends of the slide when the same is being moved in opposite directions.

Having described my invention, I claim:—

1. A separable fastener or closure device embodying, in combination, two rows of fastening members arranged in pairs, each of which constitutes an independent locking unit separate from and unconnected with adjacent pairs of independent units, each unit comprising cooperating members, one having a primary connecting element, the other member having means for engaging with said primary connecting element, and one of said members also having a secondary connection extending at right angles to the axis of the member to which it is attached and the other having means for engaging with said secondary connection, to lock the primary connecting element in connected position, and a locking and releasing slide permanently fastened to one of said rows and releasable from the other.

2. In a separable fastener or closure device, a series of pairs of locking members, each of which pairs constitutes an independent locking unit separate from and unconnected with adjacent pairs of independent units, and one of the members of a pair comprising a socketed member having at its upper edge a locking notch and the other member being provided with a primary prong extending outwardly and upwardly to engage the lower end of said socketed member while the members are disposed at an angle to each other and also having a secondary prong extending at a right angle to the axis of said member and engaging said locking notch in the member first mentioned to retain the primary prong in locking engagement when the members are brought into parallel alignment.

In witness whereof, I have signed my name to the foregoing specification.

WILLIAM WINBERG.