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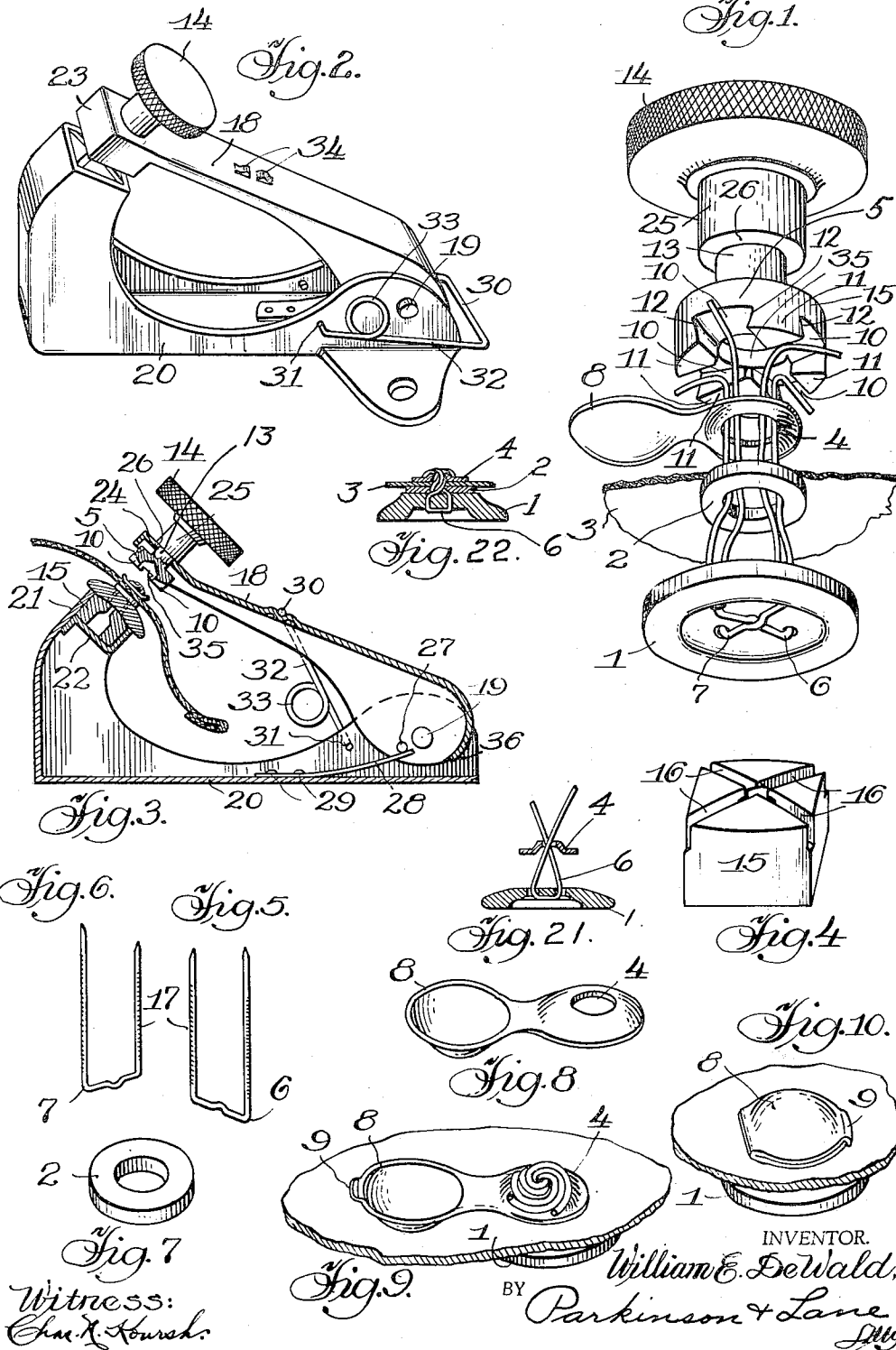
W. E. DE WALD

2,346,209

BUTTON AND FASTENING UNIT

Filed Oct. 16, 1941

2 Sheets-Sheet 1



Witness:
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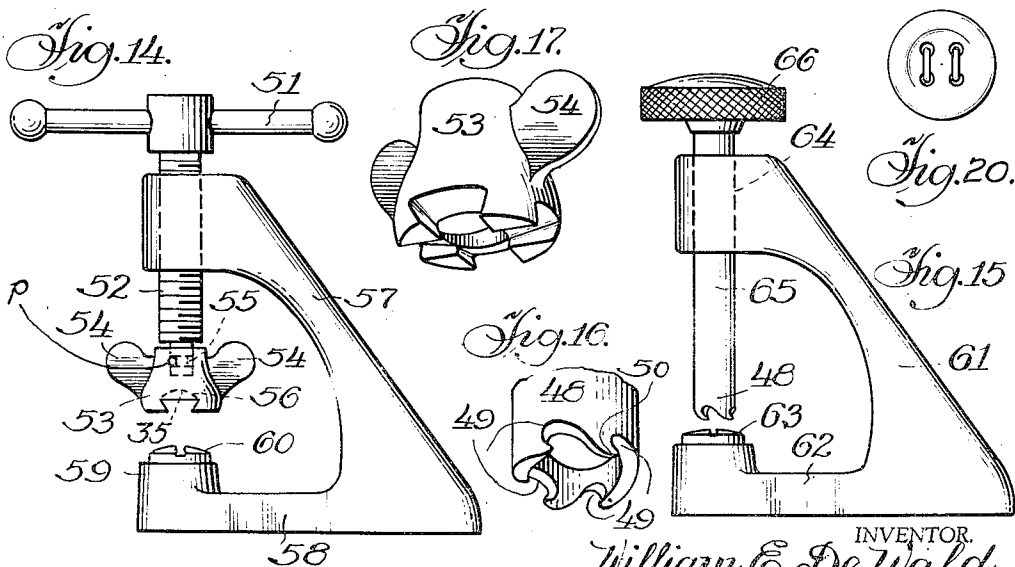
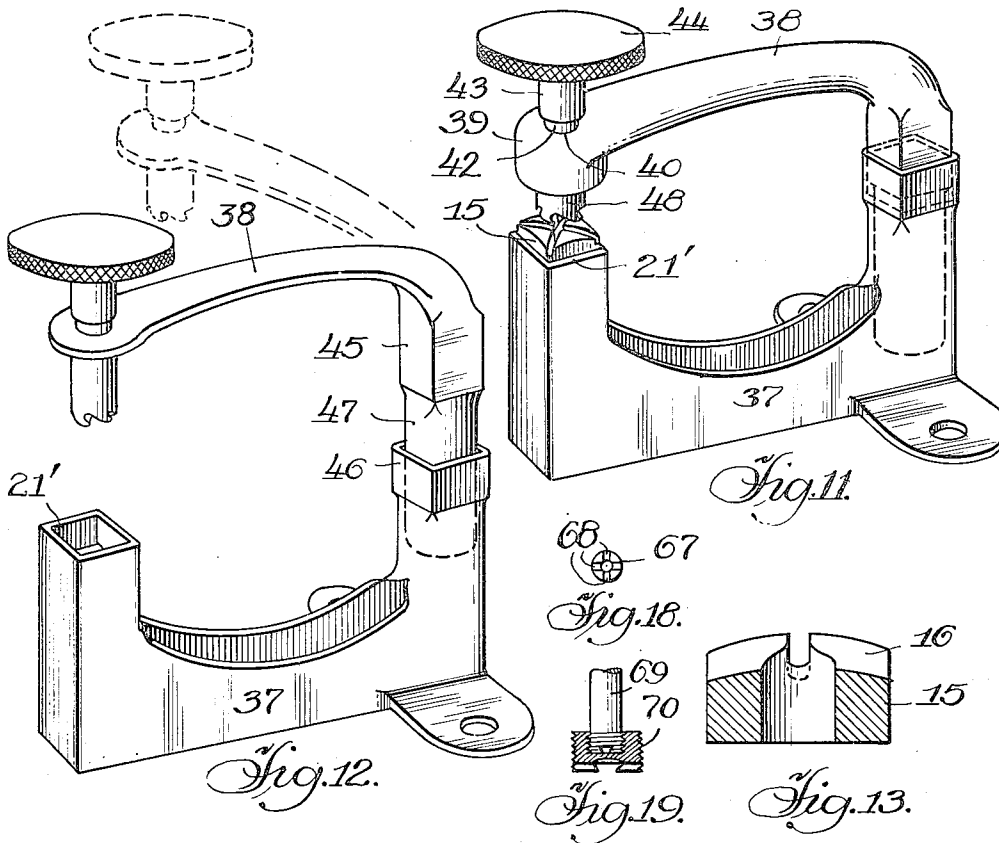
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UNITED STATES PATENT OFFICE

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BUTTON AND FASTENING UNIT

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9 Claims. (Cl. 24—94)

This invention relates to a button and fastening unit and to the means and method for producing the same. As is well known, when buttons are sewed onto clothing or other articles requiring buttons, by a needle and thread, the operation is not only time-consuming but in a relatively short time the button thus sewed on becomes loose and falls or pulls off. This difficulty is overcome in the present invention in which the button is attached to the cloth of the garment or other article with wire or the like of suitably small size and ductility, and special means are provided for giving to the wire the proper twist and the fastening unit is given a neat appearance and will not scratch the skin of the wearer.

Among the objects of the present invention is to eliminate the objections and carry out the intended purposes referred to above.

Another object is to provide means for enabling the twisting of the wire for fastening the button onto the cloth, or the like, by hand by the use merely of a twisting tool held freely in the hand.

A further object is to provide a novel arrangement and assembly of cloth, button and wire to enable easy and quick twisting of the wire to secure the button to the cloth.

A still further object is to provide a simple, convenient machine for twisting said wire.

Another object is the provision of means for covering the finished twisted wire to hide the same from sight and prevent the same from scratching or injuring the skin of the wearer of the garment on which the button is secured.

A further object is to provide novel means for spacing the button from the cloth during the fastening operation.

A still further object is the provision of a perforated head or eyelet through which the legs of wire staples are passed after passing through the holes in the button, the hole in the spacer, and through the cloth, the wire legs of said staples being twisted together both above and below the head or eyelet, the latter having a bendable extension that may be bent over to hide the twisted wire, or not as desired.

An additional object is the provision of an eyelet having an opening of a diameter smaller than the distance between the holes in the button and tapered inwardly and upwardly to facilitate passing of the staple legs upwardly through the eyelet opening and spread said legs in crossed relation to space their free ends apart to enable them to be easily further spread by the fingers of the operator to position them to be received by the notches of the twisting head.

Another object is the provision of a novel twisting head that may be formed on the end of the twisting shaft for small buttons, and formed to enable a larger head to be detachably secured thereto, when desired, for larger buttons.

A further object is the provision of a novel stationary holding head formed to receive the wire or wires on the outer face of the button, and to hold the button stationary during the twisting operation.

A still further object is to provide novel staples or bent wires of such shape as to facilitate the button fastening operation, and improve the appearance of the finished product.

Other objects, advantages and capabilities inherently possessed by my invention will later more fully appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein preferred embodiments, I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

In the drawings:

Figure 1 is a perspective view showing the parts in slightly spaced apart position to better illustrate the relation of the parts to each other prior to being pushed together and prior to the twisting operation, and in which the twisting head and its operating parts are freely held in the hand for a hand twisting operation.

Fig. 2 is a perspective view of a machine for performing the twisting operation.

Fig. 3 is a longitudinal vertical section through a median plane of the machine shown in Fig. 2.

Fig. 4 is a perspective view of one form of stationary head for holding the button removably mountable in the lower portion of the machine shown in Figs. 2, 3, 11, 12, 14 and 15.

Fig. 5 is a perspective view of a staple of wire to be pushed first through two holes in the button in a button having four holes.

Fig. 6 is a view similar to Fig. 5 but showing a staple whose closed end will cross over the closed end of the first staple, the staples of Figs. 5 and 6 having reverse crimps to interfit when pushed through the holes of the button.

Fig. 7 is a perspective view of a spacer to be positioned between the button and the cloth.

Fig. 8 is a perspective view of a head or eyelet through and against which the wire is twisted.

Fig. 9 is a perspective view of the edge of the button, the cloth and the head or eyelet, after the wire has been twisted, the head or eyelet having

an extension shown open before bending it over the twist to hide the twisted wire.

Fig. 10 is a view similar to Fig. 9 but after the extension of the head or eyelet has been bent over the twisted wire to hide the same.

Fig. 11 is a perspective view of another form of machine for carrying out my invention.

Fig. 12 is a perspective view of the machine of Fig. 11, but in a partially open position.

Fig. 13 is a vertical transverse section of a stationary head for holding the button and closed ends of the wire staples.

Fig. 14 is a side elevation of a further modification of a machine for carrying out my invention.

Fig. 15 is a side elevation of a still further modification of a machine for carrying out my invention.

Fig. 16 is a perspective view of a further form of twisting head.

Fig. 17 is a perspective view of a further modified form of twisting head.

Fig. 18 is an end view of a twisting shaft showing the twisting head for use on a small button.

Fig. 19 is a fragmentary side elevation of the lower end of a twisting shaft of the type shown in Fig. 18, and showing in vertical cross section an extension screwed thereonto to operate on a larger button.

Fig. 20 is a plan view of a button showing the wire staples being passed through the holes of the button in parallel or side-by-side relation instead of having their heads or closed ends crossed one over the other.

Fig. 21 shows a section through a button and an eyelet, and a staple being passed therethrough and showing how the legs of the wire staple cross each other as they pass through the hole of the eyelet.

Fig. 22 is a section through a button, spacer, cloth and eyelet, and showing one or more wire staples twisted into final position to secure these parts together.

Referring more particularly to the drawings, I have shown in Fig. 1 a button 1, spacer 2, cloth 3, head or eyelet 4, and twisting head 5 slightly spaced apart from each other, with a pair of wire staples 6 and 7 passed through the button holes, spacer, cloth and head or eyelet, and the free end of the staples in position in the slots in the twisting head, but before these parts have been pressed together to their intended positions. These parts are shown in final position in Fig. 9, after the twisting has been completed but before the integral tab or extension 8 of the head or eyelet 4 has been bent over the twisted ends of the wire to hide the same. Fig. 10 shows the tab or extension 8 after it has thus been bent over to hide the twisted wire. If desired, the tab or extension 8 may have a snap flange 9 formed on its free end to snap into gripping and fastening engagement with the adjacent edge of the head or eyelet 4 after being bent thereover.

As will be understood, the parts shown separated in Fig. 1 will be pushed together so that the button engages the spacer, the spacer engages the cloth and the cloth engages the head or eyelet, the free ends of the two wire staples being then bent laterally by hand and positioned roughly to extend one into each of the four notches 10 of the twisting head and extending laterally outwardly therefrom. The projections 11 defining the side walls of said notches are each undercut on each side as shown at 12 so that as the twisting head is rotated in either direction the undercut faces 12

will act to retain the wires within the notches 10 as the twisting proceeds. As seen in Fig. 1, the twisting head 5 extends upwardly in the form of a shaft or stem 13, having fixed at its upper end a disk-like handle 14 which during the twisting operation may be grasped within the palm of the hand and pressed downward to keep the various parts together and retain the wire within the notches 10. As the twisting proceeds the wires will be twisted both above and below the head or eyelet 4 until the wire above the head or eyelet assumes the twisted shape shown in Figs. 9 and 22.

During the twisting operation when twisting freely by hand the button may be placed against the top face of the stationary head 15 which is formed with angular notches 16 so arranged as to receive the crossed closed ends of the wire staples 6 and 7 to hold the button against turning, or the button may be held against turning by hand if desired. It will be understood that the twisting head 5 and twisting notches 10 therein may be of various shapes, two of which further shapes are shown in Figs. 16 and 17. As soon as the twisting of the wires has been completed as seen in Fig. 9, the extension tab 8 of the head or eyelet 4 will be bent over the twisted wires and pressed against the head or eyelet and secured in place thereon by the snap flange 9 as seen in Fig. 10, thus completing the securing of the button to the cloth, when done manually. As seen in Figs. 5 and 6, the wires forming the legs of the staples 6 and 7 may be roughened, if desired, as shown at 17, to facilitate the wire legs gripping each other during twisting and thus prevent them from slipping with relation to each other. The eyelet 4 may be positioned with either side out, but it is preferred to place it so that the concavity is toward the button, see Figs. 1, 9 and 21.

Instead of making the twist by holding the twisting means freely in the hand and pressing toward the button, the twisting may be done by mounting the twisting means in a form of apparatus shown in Figs. 2, 3, 11, 12, 14 and 15, thus giving a more positive and controllable operation. In the form of apparatus shown in Figs. 2 and 3, the twisting device shown in Fig. 1 may be mounted in the upper swingable arm 18 pivotally connected at 19 to the stationary base 20 provided with the upstanding, angularly extending socket portion 21 adapted to removably receive the stationary head 15, or any other stationary head formed with any other arrangement and form of cross slots as desired. In the form shown in Figs. 2 and 3 the upper and lower members 18 and 20 are made of sheet metal pressed by dies or the like into the shape shown with the bottom lip 22 (see Fig. 3) slitted at its sides and bent forwardly and fastened to the front wall of the socket portion 21 in any desirable manner as by welding, brazing, riveting, bolting or the like, in order to form a rigid bottom to receive and firmly hold the bottom of the stationary head 15. Preferably, the cross section of the stationary head 15 and the socket removably receiving the same, will be non-circular in order to prevent this head from rotating during the twisting operation, and permit the head to be removed and another one inserted when desired.

The forward end of the upper arm 18 is formed with a hollow portion 23 having in its upper face an opening 24 to rotatably receive the shaft or stem 13 carrying on its lower end the twisting head 5, and on its upper end the handle 14 for rotating the stem and twisting head. In order

to give ample clearance for the operator's fingers between this handle and the upper face of the arm 18 the stem 13 is formed with an enlarged portion 25 to provide the shoulder 26 which is of larger diameter than the opening 24 to form a stop to prevent further downward movement of the stem but yet permit a limited upward movement.

The upper arm 18 at a position slightly forward of the pivot 19 is formed with a protruding pin 27 against which bears the free end of the leaf spring 28, secured by rivets or the like 29 to the lower or base member 20 and so arranged as to normally urge the upper arm 18 to move in a clockwise direction as viewed in Figs. 2 and 3 when closed in order to cause arm 18 to swing to open position, when released, ready to receive the cloth, button and parts for operation upon another button. To permit the upper arm 18 to be held with some pressure against the wire, eyelet and cloth for a twisting operation, I have provided a swingable spring yoke 30, pivoted on both sides of the base member as at 31, and having at both sides upstanding spring wires 32 formed with one or more coils 33 to permit spring action when distorted. When the upper arm 18 is swung forward into position for a twisting operation and the outer or upper bar of the yoke 30 pushed between the upstanding lugs 34 the coil 33 will be distorted so as to provide sufficient pressure against the button assembly between the stationary head 15 and the twisting head 5 to enable the required twisting merely by rotating the handle 14. If additional pressure is desired, the same may be produced by merely pushing downwardly the desired amount with the hand upon the handle 14. When the twisting operation is completed the yoke 30 may be released by pulling it forcibly out from between the lugs 34, whereupon the leaf spring 28 will swing the upper arm 18 rearwardly to a sufficiently open position to give desired clearance to enable assembling of the parts for the next operation. How the twisting operation is effected in the apparatus of Figs. 2 and 3 will be clear from an inspection of Fig. 1, it being understood that when the spaced apart parts of Fig. 1 are pressed together longitudinally of the axis of twisting and the ends of the wires protrude laterally outward from the undercut notches 10, a rotation of the handle 14 will twist the wires together both above and below the eyelet 4, during which twisting operation the ends of the wires will be pulled radially inwardly through the notches 10 until the twist shown in Fig. 9 is completed, this twisted end being substantially smooth and dome-shaped (Figs. 9 and 22) by reason of the dome-shape of the recess 35 in the center of the face of the twisting face as seen in Figs. 2 and 14. This also presses the free end of the staple legs into contact with the eyelet and prevents them from standing out to catch into the cloth of the clothing.

In Fig. 2 the spring yoke 30 is shown as removed from engagement between the lugs 34 and before the upper arm 18 has swung rearwardly under action of the leaf spring 28 for illustrative purposes. It will be understood, however, that unless held downwardly by the operator's hand when spring yoke 30 is released, the upper arm 18 will move rearwardly until the end 36 strikes the bottom plate of the base 20 in order to open the jaws a sufficient distance to permit free movement therebetween in assembling the next button and associated parts. Also in Fig. 3

the jaws are for illustrative purposes shown a slight distance open, but it should be understood that when spring yoke 30 is between lugs 34 and the upper arm 18 not held back by the operator's hand, the jaws will close and sufficient pressure be exerted upon the button assembly to enable the twisting operation.

The spacer 2 may be made of any desired material such as rubber, plastics, glass, wood, metal or the like. Also the head or eyelet 4 may be turned with either side up as stated above, and the tab or extension 8 may be omitted if desired as seen in Figs. 21 and 22. It should be understood that any color of wires may be used to harmonize with any color of cloth the button may be secured to.

In Figs. 11 and 12 are shown an apparatus in which my twisting device is mounted, this apparatus comprising generally the base portion 37 and the upper arm 38 formed at its forward end with a hollow head 39 (in Fig. 11) formed at its upper side with an opening 40 to receive the shaft 42, which shaft is provided at its upper end with an enlargement 43 just below the disk-like handle 44 for similar purposes to those described in connection with Figs. 2 and 3. The right-hand end of the upper arm 38 as viewed in Figs. 11 and 12 extends downwardly and is provided with a non-circular portion 45 of such size as to slidably fit into the upstanding correspondingly shaped socket 46 of the base portion 37, so that when the upper arm 38 is moved downwardly non-circular portion 45 will be seated in socket portion 46 and prevent the forward end of arm 38 from moving laterally. Formed below non-circular portion 45 is a cylindrical portion 47, so that when the upper arm is moved upwardly a sufficient distance the cylindrical portion 47 will permit the upper arm to be swung laterally to move it away from the lower stationary head 15, which stationary head as in Figs. 2 and 3 is removably mounted in a correspondingly shaped socket, which is indicated in Figs. 11 and 12 at 21'.

The shaft 42 extends downwardly through the hollow head 39 and is formed at its lower end with a twisting head 48 formed at its bottom face with a suitable number (preferably four) of notches 49, there being on the leading lower edge of each of such notches a forwardly extending projection 50, the purpose of which is to readily pick up the adjacent wire and guide it into the notch at the beginning of the twisting operation. It is understood that the ends of the wires before the twisting head is applied thereto will be roughly spread into their approximately correct positions to be picked up by the projections of the twisting head and guided into the twisting notches at the beginning of the twisting operation. In the form of apparatus shown in Fig. 11, the pressure exerted downwardly to facilitate the twisting operation is applied by the operator with the pressure of his hand downwardly upon the upper arm 38. Otherwise than as pointed out, the twisting operation is effected in the same general manner as that described above in connection with Figs. 2 and 3. In Fig. 12 the arm 38 is shown as being of springy material that when pushed downwardly sufficient bending will occur to urge the twisting head against its work and hold it there during its operation.

In Fig. 13 is shown in vertical transverse section one form of stationary head for receiving and holding against movement the closed ends of the staples 6 and 7, which tires pass into the notches when the button is positioned over the stationary

head. This view is taken on a vertical plane passing through one of the notches 16 in the stationary head 15 of Fig. 4. As will be understood, various forms and arrangements of notches in the stationary head may be employed as desired.

Fig. 14 shows another form of apparatus in which the pressure is applied upon the button assembly by rotating the handle 51 which rotates the threaded stem 52 and by means of the threads thereon moves the stem downwardly into contact with the button assembly and with the desired amount of pressure. When the desired amount of pressure has been applied, rotation of the handle 51 is stopped and the twisting head 53, which then presses against the wires, is rotated manually by means of the wings 54, this twisting head being freely rotatable on the extended pin 55 which is formed with a circumferential groove to receive a pin P fixed in the twisting head to prevent the twisting head from falling away from the stem 52 but yet prevent free rotation thereon. As will be understood in Fig. 14, a suitable frame 57 is provided having a base portion 58 formed with a socket portion 59 to receive the stationary head 60 for similar purposes as those pointed out above in the preceding views. In Fig. 15 is provided a frame 61 having a base 62 and a socket for receiving the stationary head 63, while at the upper end it is formed with a hole 64 through which is rotatably mounted the stem 65 which is smooth and unthreaded. In operating this form of apparatus the handle 66 is manually raised to permit entry of the cloth and button assembly, after which the handle 66 and stem 65 is pushed downwardly to cause engagement with the wires of the twisting head 48 formed at the lower end of the stem and of similar formation to that described above in connection with Figs. 11 and 16. When the twisting head is in engagement with the wires a slight pressure downward is exerted on the handle 66, which is then rotated a suitable number of times and the twisting effected in the manner described earlier herein.

Fig. 17 shows the form of twisting head illustrated in the apparatus of Fig. 14, and which operates as described in connection with Fig. 14.

In Fig. 18 is shown a twisting stem 67 which at its lower end is formed with a series of twisting notches 68 similar in general to those described above, the twisting head (which may be the bottom of a stem if desired) being of small diameter for producing a twisting operation upon buttons of a small diameter. This form may also be used for fastening buttons to cloth or the like with a head or eyelet of small diameter, which because of its small diameter will enable the elimination of the spacer. The exterior lower end of the shaft 69 carrying the twisting head 67 may be formed with threads, and an additional twisting head 70 of larger diameter screwed thereon, as shown in Fig. 19, when it is desired to convert the small twisting head of Fig. 18 into a larger one but still using some of the same parts.

As shown in Fig. 20, the wire staples may be inserted into the holes in the button in a parallel or side-by-side relation if desired, instead of criss-cross as shown in Fig. 1.

As shown in Fig. 21, the diameter of the opening in the eyelet is smaller than the distance between the holes in the button, and the wall of the eyelet facing the button tapers upwardly and inwardly, so that when the staple legs are in-

serted through the hole in the eyelet the legs will be crossed and spread outwardly to facilitate more easily bending them by hand outwardly roughly into position to enter the notches in the twisting head. In Fig. 22, the twisting is shown as having been completed and the wire twisted both above and below the eyelet and cloth.

More than four notches may be used in the face of the twisting head if desired. While in Figs. 11, 12, 15 and 16 the twisting head is shown for operative rotation in a counterclockwise direction, it is to be understood that it may be made for rotation in a clockwise direction just as well if desired.

The staples may be of any shape in cross section desired, and will have their free ends preferably of unequal length and pointed so as to facilitate convenient piercing of the material to which the button is being attached. I, however, do not wish to be limited thereto as other forms may be used without departing from the spirit of my invention.

Having now described my invention, I claim:

1. In combination, a button having holes, supporting material for said button, an eyelet on the side of the supporting material away from the button, said eyelet having an opening therein, wire staples having legs passing through the button holes, the supporting material and the opening in the eyelet and therebeyond, the portion of the staple legs extending beyond the eyelet being tightly twisted together against the face of the eyelet, for securing the button to the supporting material the free ends of the staple legs in the twisted portion being held closely against the body of the twisted portion to prevent engagement of said ends with other objects.

2. In combination, a button having holes, supporting material for said button, an eyelet on the side of the supporting material away from the button, said eyelet having an opening therein, wire staples having legs passing through the button holes, the supporting material and the opening in the eyelet and therebeyond, the portion of the staple legs extending beyond the eyelet being tightly twisted together against the face of the eyelet, for securing the button to the supporting material, said eyelet having an extension covering the twisted ends of the staple legs.

3. In combination, a button having holes, supporting material for said button, an eyelet on the side of the supporting material away from the button, said eyelet having an opening therein, wire staples having legs passing through the button holes, the supporting material and the opening in the eyelet and therebeyond, the portion of the staple legs extending beyond the eyelet being tightly twisted together against the face of the eyelet, for securing the button to the supporting material, and a spacer between the button and the supporting material the free ends of the staple legs in the twisted portion being held closely against the body of the twisted portion to prevent engagement of said ends with other objects.

4. Button fastening means comprising supporting material having a button on one side and an eyelet on the other, said button having openings therein, wire means having wire legs passing through the openings in the button, through the supporting material and through the eyelet, the eyelet having an opening therein, the face of the eyelet toward the button being tapered toward the eyelet opening, said opening being

smaller in diameter than the distance between the openings in the button, whereby when the wire legs are passed through the button, supporting material and eyelet said legs, as they pass through the eyelet opening, will be crossed one over the other at an angle to move their free ends apart, said crossed legs being arranged in a tightly twisted portion free of projecting ends that would catch on other objects.

5. Button fastening means comprising supporting material having a button on one side and an eyelet on the other, said button having openings therein, wire means having wire legs passing through the openings in the button, through the supporting material and through the eyelet, the eyelet having an opening therein, the face of the eyelet toward the button being tapered toward the eyelet opening, said opening being smaller in diameter than the distance between the openings in the button, whereby when the wire legs are passed through the button, supporting material and eyelet said legs, as they pass through the eyelet opening, will be crossed one over the other at an angle to move their free ends apart, said legs being arranged in a twisted portion bearing against the eyelet, the free ends of the legs in the twisted portion being free of projections that would catch on extraneous objects.

6. Button fastening means comprising supporting material having a button on one side and an eyelet on the other, said button having openings therein, wire staples having wire legs passing through the openings in the button, through the supporting material and through the eyelet, the eyelet having an opening therein, the face of the eyelet toward the button being tapered toward the eyelet opening, said opening being smaller in diameter than the distance between the openings in the button to facilitate the crossing of the wire legs one over the other as they are passed through the button, supporting material and eyelet, said legs being arranged in a twisted portion both above and below the eyelet, that part of the twisted portion above the eyelet being free of projecting parts that would catch on extraneous objects.

7. Button fastening means comprising supporting material having a button on one side and an eyelet on the other, said button having openings therethrough, wire staples having legs passing through the openings in the button, through the supporting material and through the eyelet, the eyelet having an opening therein, said legs being in twisted formation on both the outside and inside of the eyelet, that portion of the twisted formation outside of the eyelet forming a closely compacted head free of any projecting ends that would catch on extraneous objects.

8. Button fastening means comprising supporting material having a button on one side and an eyelet on the other, said button having openings therethrough, the eyelet having an opening therethrough, wire staples having legs passing through the openings in the button, through the supporting material and through the eyelet, said legs being in twisted formation on both the outside and the inside of the eyelet for securing the button to the supporting material, that portion of the twisted formation outside of the eyelet forming a closely compacted head bearing against the eyelet and free of any projecting ends that would catch on extraneous objects, and a spacer between the button and the supporting material.

9. Button fastening means comprising supporting material having a button on one side and an eyelet on the other, said button having openings therethrough, the eyelet having an opening therethrough, wire staples having legs passing through the openings in the button, through the supporting material and through the eyelet, said legs being in twisted formation on both the outside and the inside of the eyelet for securing the button to the supporting material, that portion of the twisted formation outside of the eyelet forming a closely compacted head bearing against the eyelet, said eyelet having an extension covering the twisted head outside of the eyelet.

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