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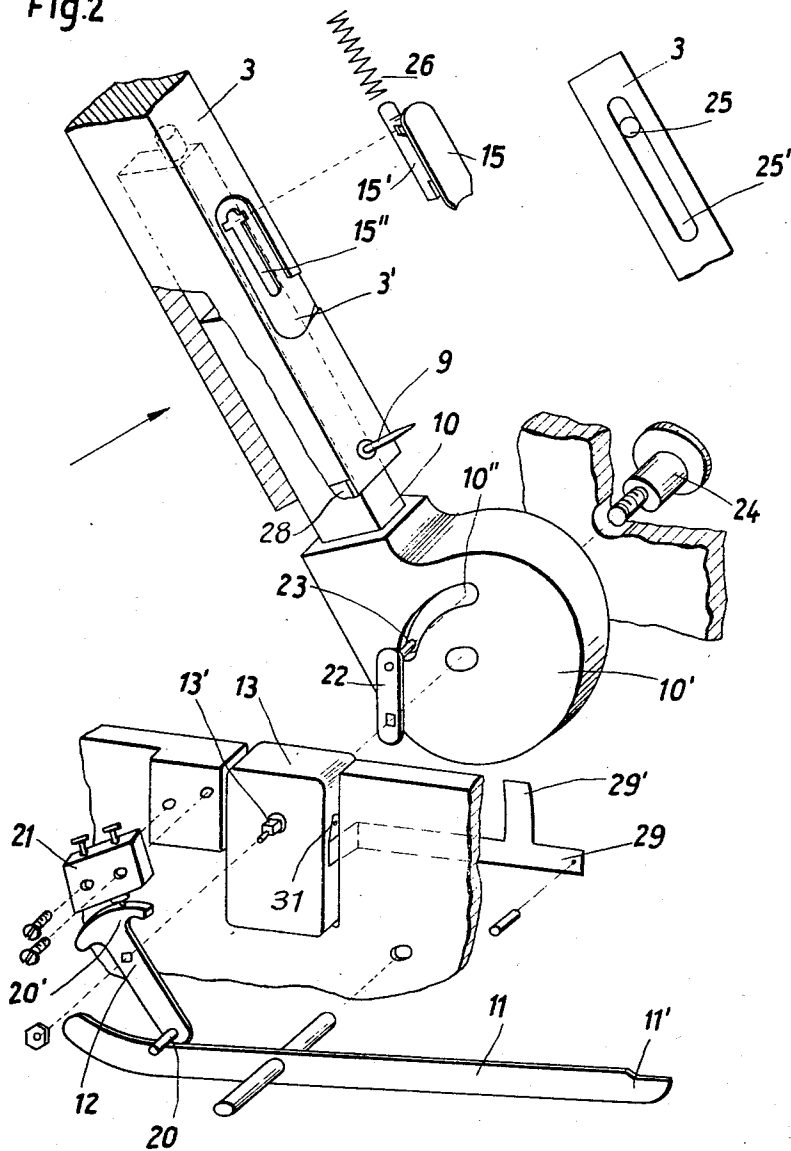
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APPARATUS FOR FASTENING BUTTONS ON FABRICS

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2 Sheets-Sheet 2

Fig. 2



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APPARATUS FOR FASTENING BUTTONS ON FABRICS

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5 Claims. (Cl. 156—513)

The present invention provides an apparatus for fastening thermoplastic buttons on textile fabrics of all kind, for example clothing articles or similar articles, by deformation of a pin located at the button to be fastened.

Machines or devices for the sewing on of buttons are known. Such machines, however, are too big or too expensive, so that small laundries or similar small-sized industrial enterprises cannot afford them. In addition, these machines are not suited for a subsequent fastening of buttons lost here and there on, for example, washed, ironed, and even already folded clothing articles. Buttons of plastic which can be affixed onto clothing articles by a thermal treatment or by a corresponding deformation are also known. However, this method of fastening such buttons, which makes unnecessary the cumbersome sewing, has not been generally accepted, owing to the fact that no suitable, expedient and easily operable apparatus has been available.

Thus, it has been an object of the present invention to provide an apparatus which permits easy and secure fastening of such plastic buttons to fabrics of all kind.

This object is met by the apparatus of the present invention which comprises a fabric support plate provided with an opening, furthermore a heating unit and a deforming ram rod positioned in the space of the opening below said plate and an operating arm provided with a button holder, said ram being connected with a time switch which is of such construction as to form a switching element for releasing the heater and the ram rod.

The mechanical coupling of all operational steps for fastening a button makes it possible to effect this fastening of a button onto a substratum by the operation of one lever only.

An exemplary embodiment of the apparatus of the present invention is shown in detail in the accompanying drawings.

In these drawings:

FIGURE 1 shows a perspective view of the apparatus of the invention and in exploded view the heating element and the support plate.

FIGURE 2 shows perspective view of some parts of the apparatus, in particular the switch unit.

Thus, the apparatus of the present invention essentially comprises case or housing 1, the operating arm consisting of two parts 10, 3, the transformer 2 for the heater, a clamp plate 4 mounted at case 1 by screws 16, and provided with a slot which ends in the opening 4'. Below the said plate 4, case 1 also has an opening 5 in which is positioned the heating unit 6. This heating unit consists of a cylindrical body 6 which has connecting terminals 6' fitting into the small socket 14 for the heating wire arranged in the form of a basket around the opening 19.

In the opening 19 is positioned the ram rod 8, the upper end of which bears a cap of polytetrafluoro-ethylene 8' in order to prevent the deformed and sticking plastic from adhering to the ram rod. The cylindrical heater 6 is covered at its upper end by cap 5'. The small socket in case 1 is connected with the transformer 2, which itself is connected with the mains 17. The op-

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erating arm consists of arm 10 and hub 10', which has at its side a curved slot 10". Over arm 10 is placed a slideable casing 3, the sliding distance of which is limited by pin 25 in slot 25'. For holding the button to be affixed, casing 3 is provided with a hollow space 3', taking up a small clamp plate with sliding guide 15' which fits into the guide groove 15" and is under the tension of the small spring 26.

The slideable casing 3 is provided with a piercing pin 9 and a dog 28, the function of which will be explained later on. When casing 3 is in the normal position, the piercing pin 9 penetrates into the corresponding opening 9' in case 1. When casing 3 is in the extended position, i.e., in the position in which a preliminary hole is made, the prepiercing pin 9 penetrates into the hole 4' of clamp plate 4 and into the opening 19 of the heating unit. For switching on the heating unit 6 and for actuating the deforming ram rod 8, case 1 is provided with the time switch 13, on the axle 13' of which is mounted crank 22 with the crank pin 23 and another double crank 12 having pin 20 and the curved piece 20'. The pivoting axle 24 of the operating arm 10, 3 and axle 13' of the time switch are arranged coaxially.

The time switch unit is provided at the side with a small arm 31 which extends to the lever 29 in the case. The tongue 29' of said lever 29 lies in the path of dog 28, when the casing 3 is in the normal position. A so-called mini-switch 21 is placed within the moving path of the curved piece 20' of double crank 12; this switch is connected, on the one hand, with the transformer, and, on the other hand, with the heating wire 7. The other arm of the double crank 12 is connected over pin 20 with arm 11, the front end of which engages below the deforming rod 8.

The above-described apparatus operates as follows: When the operating arm 10, 3 is lifted, the time switch is wound up by crank 22 and pin 23. The fabric to be provided with a button is then placed below plate 4 and the extensible operating arm with extended casing is lowered to permit the prepiercing pin 9 to pierce through the fabric and through hole 4'. By this lowering of the arm, the actuating mechanism is not yet started, since in the extended position of casing 3 dog 28 does not trip tongue 29' of arm 29. When the prepiercing is effected, the operating arm is raised and a button with a thermoplastic pin is inserted into the button holder. In this holder the button is held by slider 15 which is pressed by the spring in casing 3. Casing 3 is then allowed to return to the normal position and the operating arm is lowered. Thereupon, the piercing pin 9 enters into the opening 9' of the case and the pin of the inserted button penetrates through the opening 4' of the clamp plate 4 and through the hole in the fabric. In this lowered position, dog 28 presses against tongue 29' as the casing 3 is in the normal position and thereby starts the time switch. The double crank 12 is thereby released and its curved piece 20' switches in the mini-switch 21 and therewith the heater, while the other arm somewhat later actuates the arm 11, whereby the deforming rod 8 is moved from below through the heating unit 6 and presses against the preheated pin of the inserted button and deforms it in the form of a rivet. The time switch is triggered by means of a dog (not shown) and runs during the period of time necessary for preheating the pin of the button and for lifting the deforming rod 8. After these operational steps, the fabric can be withdrawn from below the clamp plate and presents a button which is securely affixed to it in an easy way.

Therefore, the apparatus of the present invention for fastening buttons can be used and applied by everybody, for example, housewives, but also in the manufacture

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of clothing articles and above all in laundries, ironing shops and similar trades. Especially in the last-mentioned trades have a great need for such an apparatus, since it happens often that clothing articles lose buttons during washing. Laundries in general do not replace such lost buttons and the clothing articles are then returned in an unsatisfactory state which often disappoints the clients. The apparatus of the present invention which permits easy fastening of buttons to textile articles of any kind offers a remedy to this unsatisfactory state.

I claim:

1. An apparatus for piercing fabric and subsequently fastening thermoplastic buttons provided with a pin to the pierced area thereof comprising, a housing containing a fabric supporting means, a heater unit and time switch means for actuation thereof, a movable deforming means associated with said heater unit, operating arm means pivotally connected with said housing, a piercing means movably mounted in said operating arm adapted to assume a first position for piercing said fabric and a second position, means on said arm for operating said time switch and means to move said deforming means to secure a button in the pierced area of said fabric when appropriately applied thereto.

2. An apparatus for piercing fabric as claimed in claim 1, wherein said operating arm means includes means

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adapted to support a thermoplastic button for insertion in said pierced area of the fabric when the arm is returned to its second position, whereupon it actuates the time switch for energizing the heater unit.

3. An apparatus for piercing fabric as claimed in claim 1, wherein the fabric supporting plate which is secured to said housing includes means defining an opening in axial alignment with the deforming means.

4. An apparatus for piercing fabric as claimed in claim 1, wherein the deforming means includes a cap portion of polytetrafluoroethylene.

5. An apparatus for piercing fabric as claimed in claim 3, wherein the fabric supporting plate includes a bifurcated portion adapted to intersect the means defining an opening in axial alignment with the deforming means.

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