

Nov. 5, 1935.

A. THOMAS

2,019,586

THREAD DRAWING MACHINE

Filed May 23, 1934

2 Sheets-Sheet 1

Fig. 2.

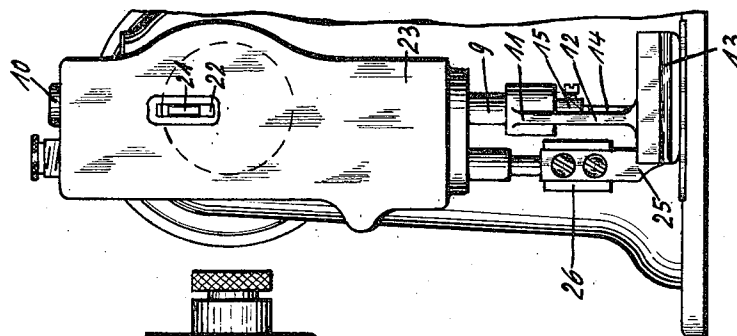
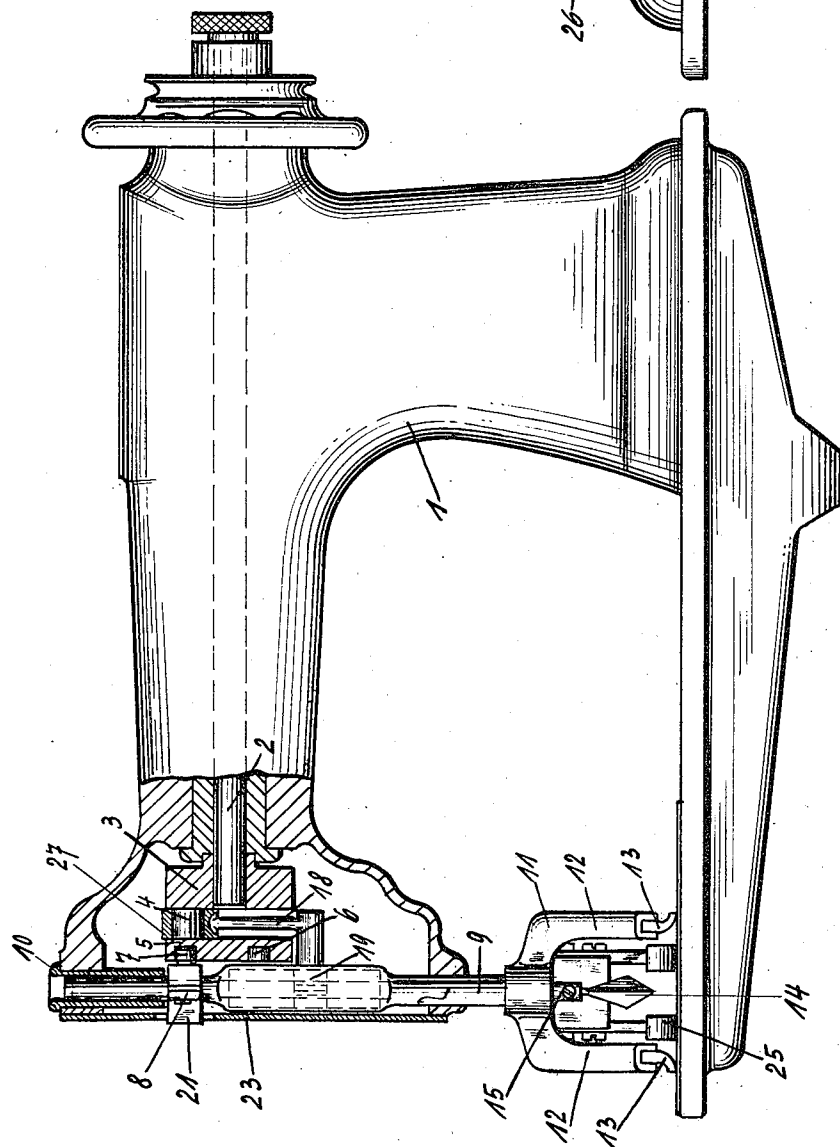


Fig. 1.



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Fig. 3.

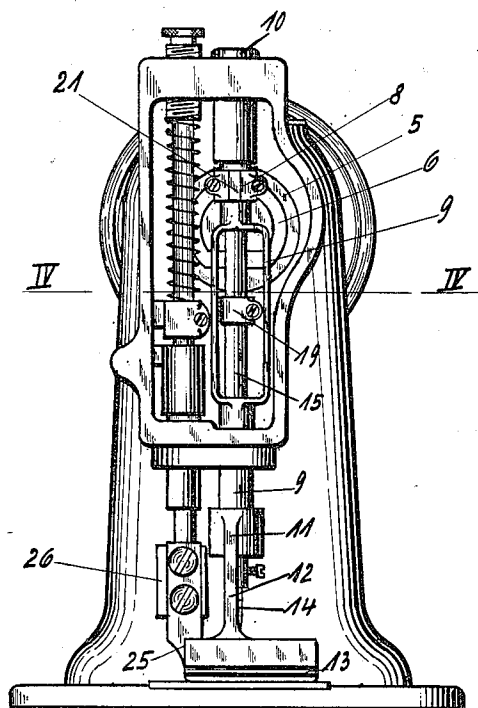
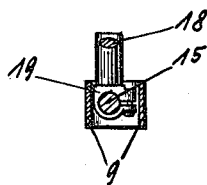


Fig. 4



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UNITED STATES PATENT OFFICE

2,019,586

THREAD DRAWING MACHINE

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Application May 23, 1934, Serial No. 727,173
In Germany July 10, 1933

11 Claims. (Cl. 112—78)

The instant invention relates to an improvement in thread drawing machines, more particularly of the type disclosed in Patent No. 1,984,501, issued December 18, 1934. This invention relates in particular to the simplification of the drive for the special presser feet for a thread drawing machine, disclosed in the above patent, and to the cooperation of these special presser feet with the piercing blade.

The invention consists particularly in forming the rod for the special presser feet as a hollow body which guides the rod of the piercing blade. One or more open recesses are provided in the hollow body for the connection of the crank arm with the rod, which effects the reciprocating movement of the piercing blade. In accordance with the invention, the curved-groove disc, which effects the actuation of the special presser feet, is united with the crank for driving the piercing blade in a single cast piece. A roller, fixed upon the hollow shaft of the special presser feet, engages directly in the curved groove of the cam disc.

By the above arrangement, a complete series of advantages are obtained. In the first place, certain parts which are necessary for the drive of the machine in accordance with the aforesaid Patent No. 1,984,501, are eliminated. This is the case in particular with the inconvenient transmission shaft, lying outside of the sewing machine arm, and extending from the curved groove to the presser foot rod, as well as with crank arm fixed upon this transmission shaft. Aside from this, the coaxial disposition of the rod for the piercing blade and the rod of the special presser feet makes possible an equilateral and symmetrical formation of the U-shaped yoke which carries the legs of the special presser feet, which in turn influences favorably the division of the pressure and the uniformity of the tension imposed upon the material. By the elimination of all special external bearings for the transmission parts and by the placement of all the driving parts upon the inside of the arm, there results the possibility of using a machine arm of the usual dimensions for thread drawing machines.

An embodiment of the invention is illustrated in the accompanying drawings, wherein

Fig. 1 is a front view of the machine with certain parts shown in section,

Fig. 2 is a left end view thereof,

Fig. 3 is a left end view of the machine with the cover removed therefrom, and

Fig. 4 is a sectional view along line IV—IV of Fig. 3.

In Fig. 1 is shown the sewing machine arm 1 containing the usual drive shaft 2, upon which is fixed a unitary cast body 3, 4, 5. Portion 3 of this cast body corresponds to the crank arm, and portion 4, to the crank pin. The crank arm 3 is directly united in a single piece, by means of the crank pin 4, to a grooved cam disc 5. A roller 7, carried upon a clamping piece 8, engages in the groove 6 of the cam disc 5, the clamping element 8 being attached to the hollow member 9. This hollow member or presser-bar 9, which is substituted for the massive rod for the special presser feet in the machine disclosed in the above patent, is guided at its lower end directly in the machine arm, and at its upper end, in a special bush 10. This hollow member carries an equilaterally formed U-shaped yoke 11, in the legs 12 of which are inserted the presser feet or lugs 13 of resilient material, such as rubber. The U-shaped yoke 11 with its legs 12 embraces the 20 presser feet 25 of the normal presser-bar 26.

The reciprocating rod 15, carrying the piercing blade 14, is arranged inside of the hollow member 9. Upon the rod 15 is engaged, in known manner, a connecting rod 18 by means of a split block 19. In order to enable the bearing head of the connecting rod 18 to be mounted upon the crank pin 4, the bearing head 27 is split or divided in known manner. In order to enable the movement of the split block 19 through the hollow body 9 and an unhindered relative movement of the body 9 and the rod 15, the mid-portion of the hollow body 9 is enlarged and is open at either the inner side alone or on both sides, thereby resulting in a cross-section, as shown in Fig. 4.

A guiding lug or projection 21 is connected with the clamping piece 8 upon the hollow body 9, which slides in a slot 22 in the cover 23. This arrangement eliminates rotative movement of the hollow member 9 which would interfere with its up and down movement and cause the roller 7 to jam in the cam groove 6.

By the arrangement in accordance with the invention, all the driving elements may be disposed within the sewing machine arm; and, by the elimination of all the exterior bearing projections, it is possible to use as well a machine arm of the usual dimensions for thread drawing machines.

The machine as described works in the following manner: The normal presser-bar is pressing on the material. The special presser-bar goes down before the blade pierces the material. Its rubber feet are spread in meeting the

material, and in this manner tightly draw the material before the blade pierces.

What I claim is:

1. In a machine of the class described, presser feet, a piercing tool, a hollow presser-bar connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, and means for actuating said hollow presser-bar and reciprocating rod.
2. In a machine of the class described, presser feet having resilient extremities, a piercing tool, a hollow presser-bar connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, and means for actuating said hollow presser-bar and reciprocating rod.
3. In a machine of the class described, presser feet, a piercing tool, a hollow presser-bar connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, means for actuating said rod comprising a drive shaft and connections between said drive shaft and rod, and at least one opening in said hollow presser-bar for permitting the movements of said connections.
4. In a machine of the class described having a head, presser feet, a piercing tool, a hollow presser-bar in said head connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, and unitary driving means wholly within said head for actuating said hollow presser-bar and reciprocating rod.
5. In a machine of the class described having a head, presser feet, a piercing tool, a hollow presser-bar in said head connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, and driving means wholly within said head for actuating said hollow presser-bar and reciprocating rod comprising a drive shaft, an integral unit fixed to said drive shaft consisting of a crank arm, a crank pin for reciprocating said rod, and a cam disc for driving said hollow presser-bar.
6. In a machine of the class described having a head, presser feet, a piercing tool, a hollow presser-bar in said head connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, and driving means wholly within said head for actuating said hollow presser-bar and reciprocating rod comprising a drive shaft, an integral unit fixed to said drive shaft consisting of a crank arm, a crank pin and a grooved cam disc,

a roller on said hollow presser-bar engaging said cam disc and a connecting rod between said crank pin and reciprocating rod.

7. In a machine of the class described, presser feet for stretching the material, a piercing tool, an equilateral yoke for carrying said presser feet, a hollow presser-bar connected with said yoke, a reciprocating rod for said piercing tool fitted within said hollow presser-bar and passing through the central portion of said yoke, and means for actuating said hollow presser-bar and rod

8. In a thread drawing machine, a conventionally dimensioned arm adapted for household sewing machines terminating in a hollow head, presser feet for stretching the material, a piercing blade, a hollow presser-bar in said head connected with said presser feet, a reciprocating rod for said piercing blade fitted within said hollow presser-bar, and unitary driving means wholly within said head for actuating said hollow presser-bar and reciprocating rod.

9. In a machine of the class described having a head, a cover for said head having a slot therein, presser feet, a piercing tool, a hollow presser-bar in said head connected with said presser feet, a reciprocating rod for said piercing tool fitted within said hollow presser-bar, driving means wholly within said head for actuating said hollow presser-bar and reciprocating rod comprising a drive shaft, an integral unit fixed to said drive shaft consisting of a crank arm, a crank pin and a grooved cam disc, a roller on said hollow presser-bar engaging said cam disc, a connecting rod between said crank pin and reciprocating rod, and a guiding lug on said hollow presser-bar slidable within the slot in said cover.

10. In a thread drawing machine, a normal presser-bar, presser feet on said normal presser-bar constantly pressing against the material, a second hollow presser-bar, an equilateral yoke on said second presser-bar terminating in presser feet, said last-mentioned presser feet embracing symmetrically said first-mentioned presser feet, a piercing tool, a reciprocating rod for said piercing tool within said second hollow presser-bar, and means for imparting vertically reciprocating movements to said second presser-bar and said rod during the machine operation.

11. The machine as claimed in claim 10, wherein the last-mentioned presser feet have resilient extremities arranged in parallel to the first-mentioned presser feet.

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