Oct. 17, 1950 F. VANADIA 2,526,304

SHANK CONNECTION FOR THE PRESSER FOOT OF A SEWING MACHINE AND METHOD OF PRODUCING SAME

Filed Sept. 12, 1946

Fig. 1

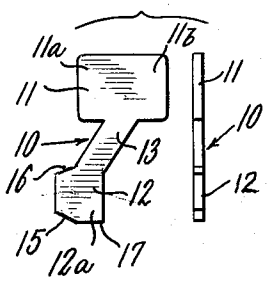


Fig. 2

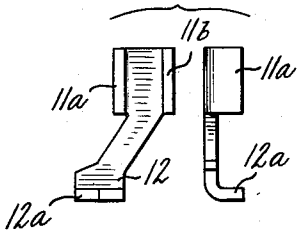


Fig. 3

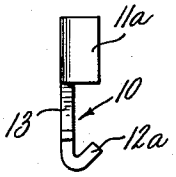


Fig. 4

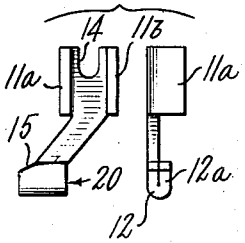


Fig. 5

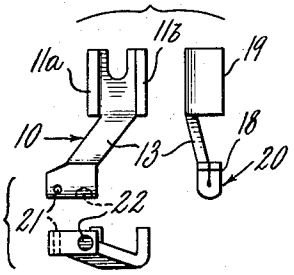


Fig. 6

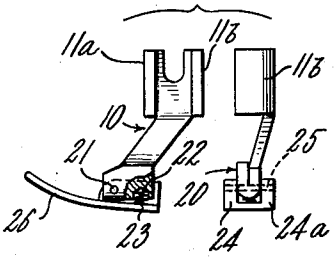


Fig. 7

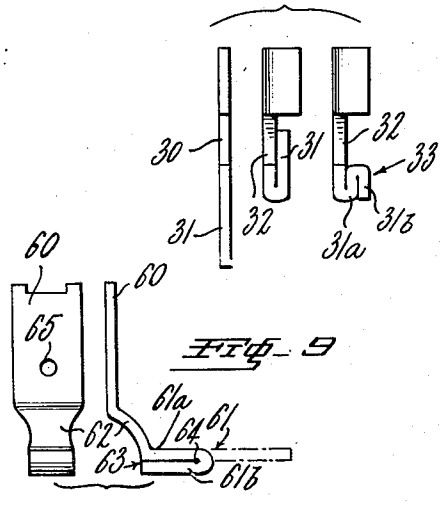


Fig. 8

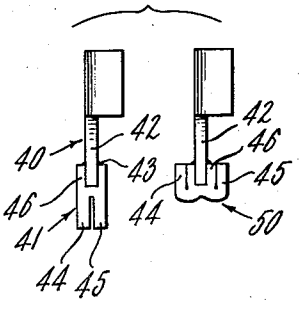


Fig. 9

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SHANK CONNECTION FOR THE PRESSER FOOT OF A SEWING MACHINE AND METHOD OF PRODUCING SAME

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3 Claims. (Cl. 112—235)

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This invention relates to a method of making presser foot structures for sewing machines, and further concerns the formation of the shank for such presser foot structures.

Known methods for manufacturing and finishing presser foot structures for sewing machines necessitate rather complicated and expensive operations, which for different presser foot widths had to be varied and changed to the extent, that for each presser foot width a corresponding shank or holder therefor had to be produced and kept in stock.

The present invention intends to overcome these and other disadvantages inherent in known manufacturing methods and contemplates the provision of means for obtaining a new shank structure capable of being easily adapted to fit various presser foot widths.

It is, therefore, an important object of the present invention to provide means for producing the end of the shank for foot pieces of the aforesaid type which is independently shaped so as to be easily and readily associated or connected with presser foot pieces, the attachment being either rigid or pivotal.

It is another object of this invention to provide a simplified method saving labor, time and material for making from a single elongated piece of substantially flat and cold steel material presser foot shanks whose ends or extremities may be conveniently bent or otherwise formed to be fittingly inserted in a recess or between the flanges of presser foot pieces having various widths and different spaces between said flanges to which said shanks are to be applied.

A further object of this invention is to provide means facilitating the change of the shank end as to width and centricity relatively to the foot piece and the fitting of the end of a presser foot shank in the foot piece.

Still a further object of this invention is to provide means offering the possibility of shaping by cutting and/or overlapping the end of the shank for presser foot pieces whereby one and the same shank may be employed for connection with various shapes of foot pieces.

Yet another object of the present invention is to provide a new presser foot structure derived from the above mentioned methods, which is inexpensive to manufacture, is of simple and practical construction, and can be applied to various types of sewing and like machines.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

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For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawing, in which:

Fig. 1 shows, respectively, a front view and a side elevational view of a blank from which the shank for a presser foot is produced;

Figs. 2 to 4 illustrate respective steps in the manufacturing method of the shank;

Fig. 2 shows front- and side-elevational views, respectively, of said shank after completion of one of the first forming steps;

Fig. 3 is a side-elevational view of the shank shaped according to a further step;

Fig. 4 shows front view and side-elevational view of the shank in a form prior to its assembly with a presser foot;

Fig. 5 illustrates front, side and end views of the finished shank after completion of drilling operations;

Fig. 6 shows, respectively, front and side-elevational views of the shank in assembled condition and pivotally applied to one type of presser foot;

Figs. 7 and 8 illustrate each a modified embodiment of the invention, showing the shank end shaped to provide a reinforced vertically extending base;

Fig. 7 showing side-elevational views of a blank of an elongated shank and further of the shank progressively developed and finally a side-elevational view of the shank with a finished, reinforced base;

Fig. 8 shows side-elevational views of a two-piece shank with the base seen in two different developing stages;

Fig. 9 discloses front and side-elevational views of a modified shank with a reinforced horizontal base.

Referring now more particularly to the drawing, there are shown several steps employed in the manufacturing method of a presser foot structure made in accordance with this invention.

Fig. 1 shows a front view and a side-elevational view of the shank 10 made from a length of a flat cold rolled steel material provided with the upper and head portion 11 and the lower or base portion 12. The intermediate portion 13 extends in oblique or inclined direction between

head portion 11 and base portion 12. The shank blank 10 is obtained by a suitable known stamping operation from a length of a substantially flat steel piece (not shown), as may be easily realized.

Shank blank 10 is subsequently subjected to a die-forming operation in which the lobes 11*a* and 11*b* will be bent parallel to each other, whereas the lowermost part 12*a* of the base portion 12 has been substantially rectangularly bent about the horizontal axis of said portion 12, so that in a further forming operation part 12*a* will assume a substantially inclined position, as shown in Fig. 3.

Fig. 4 shows a further development in the shaping of the shank which is then provided between flanges or lobes 11*a* and 11*b* with a cut-out 14 to thereby form an upright mounting to facilitate attachment of the shank with the known foot bar (not shown) of a sewing machine.

Base portion 12, in this stage of the forming operation, consists of the overlap portion 12*a* which is so arranged with its lowermost edge that the inclined edge portion 15 substantially coincides with the upper inclined edge 16 of base portion 12, as may be visualized from Fig. 4, whereas the length of the lower straight edge portion 17 corresponds approximately to the width of the intermediate portion 13 of shank 10. Thus, correspondingly shaped side edges of the end portion coincide with each other and a reinforced or thickened (overlap) shank base or base portion 20 is obtained which may be further subjected to a die pressing action by which the intermediate portion 13 is so shaped that the outer edge 18 of the thickened or reinforced base portion 20 will lie substantially in alignment with the outer edge 19 of the flange portions 11*a* and 11*b* of the shank 10. The shank may then be ground and finally subjected to drilling operations so as to obtain a horizontal bore or opening 21 in said reinforced end portion 20 adjacent the location of the inner bend of the folded extension or overlap 12*a* and also a recess 22, the latter forming a bearing for a spiral spring 23 (Fig. 6), whereas opening 21 is adapted to receive a pin 25 for pivotally connecting the enlarged base portion 20 in position within the shoe slot provided between the flanges 24, 24*a* of the shoe or presser foot proper. The shoe 26, in this instance, is urged by the action of the aforesaid spring 23 (Fig. 6) to assume an angular position with respect to the shank 10 and may swing about an axis perpendicular or crosswise to the plane of the remainder of the shank 10.

Fig. 7 shows a modification of the construction of the shank blank 30, whose lower end or base portion 31 is somewhat longer than that indicated by numeral 12 in Fig. 1. Fig. 7 shows in two consecutive steps how the end 31 is bent to first overlap somewhat the intermediate shank portion 32, and then the manner by which the extremity of the shank portion 31 is bent in meander form to overlapping position with respect to the remainder of the shank to obtain portions 31*a* and 31*b* forming a base portion 33 of increased thickness.

Fig. 8 shows a further modification according to which the shank 40 is provided with a fork-like extension 41. This fork-like extension forms the base portion of the shank 40 and may be welded to or may be formed integrally with the intermediate portion 42 of the shank. In the present instance, the end of the intermediate portion 42 is welded at 43 to the fork-shaped end 41 whose prongs or fingers 44 and 45 may be subsequently bent to overlap the reinforced or enlarged base end 46, as can be visualized from Fig. 8, which shows said base 50 with a thickened end in final position.

It is, of course, understood that one of the prongs 44 or 45 may be cut off, if it were desired to obtain a base portion with a reduced thickness as compared to that shown in Fig. 8.

Thus, it will be noticed that one and the same standard shank may be readily conformed to various sizes and shapes of presser foot structures and for connection therewith, whereby such structures may be produced in an economical and less expensive manner.

It is obvious that the end of the shank may not only be formed with its overlap extending in vertical direction and in contact with the intermediate shank portion, as hereinabove described, but may also be shaped to overlap in a horizontal direction and substantially in rectangular relationship to the intermediate shank portion.

In both cases, the end or base of the shank will be reinforced or enlarged to fit any particularly constructed presser feet.

Fig. 9 shows a further embodiment of the invention. Shank 60 has an extension 61 while a curved portion 62 interconnects extension 61 with the upright portion of the shank. Extension 61, during the ensuing die-shaping operation, is folded substantially in horizontal direction and below base portion 61*a*, so as to form the portion 61*b*. Thus, a reinforced overlap base 63 is obtained which has at its bent end an opening 64 through which a pin (not shown) may be passed for connection with the presser foot. Thus, any drilling operation may be eliminated for bringing about an opening for the connecting pin and it will only be necessary to ream or otherwise widen and finish the aforesaid opening or hole obtained at the inner bend of the overlap which opening is directed to extend parallel to the plane of the remainder of said shank.

The overlapping portions 61*a* and 61*b* are so pressed together that a substantially unitary base 63 is obtained. Opening 65 in the upright portion of the shank may be employed to connect the shank with the presser foot bar, whereas base 63 is adapted for pivotal or fixed connection with the known presser foot or shoe proper (not shown).

It is to be observed with respect to the embodiment of Fig. 8 that extension or base 41 of the shank 40 may be fitted to directly engage the shoe slot of a shoe of a presser foot to which said shank base may be either pivotally or solidly (by welding) connected.

It can thus be seen that there has been provided in accordance with this invention a new method and means for obtaining a shank adaptable for connection with a shoe of a presser foot, which method may be carried out by simple stamping and die-shaping operations so as to lend itself for (pivotal or solid) connection with various shoe or presser foot structures.

As many possible embodiments may be made of the above invention, and as many changes might be made in the embodiments above set forth, it is to be understood that all matters hereinbefore set forth or shown in the accompanying drawing, are to be interpreted as illustrative and not in a limiting sense.

Having thus described the invention, what is

claimed as new and desired to be secured by Letters Patent, is:

1. The process of producing a shank for pivotal connection with the presser foot structure of a sewing machine, which consists in forming a shank with an upright mounting and a lower end portion defined by correspondingly shaped side edges, folding said end portion upon itself about the horizontal axis of said end portion whereby said correspondingly shaped side edges coincide with each other, respectively, and a reinforced shank base is obtained which is adapted to fit the shoe slot of a predetermined presser foot, and providing a bore in said reinforced shank base perpendicular to the plane of the remainder of said shank for the insertion in said bore of a pin about which said presser foot pivots.

2. A shank connection for the presser foot of a sewing machine comprising a shank terminating in a base portion at one end of said shank, and extension means overlapping at least partly said base portion and being of the same thickness as that of said shank so as to provide a reinforced shank base fitting a predetermined slot of the presser foot, said reinforced shank base being provided with pivot means affording swinging connection of said shank base with said presser foot whereby the latter may be swung in a plane

parallel to that of said shank, said reinforced shank base including an inner bend adjacent which said pivot means extends.

3. A shank connection for the presser foot of a sewing machine comprising a shank provided with a base portion at one end of said shank and projecting therebeyond and substantially in alignment therewith, extension means carried by said base portion of said shank and folded over said base portion to reinforce the latter, said reinforced base portion being provided with a bore passing therethrough at a location adjacent the bend of said folded over extension means to facilitate pivotal connection of said presser foot with said shank.

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