

Oct. 9, 1951

T. LOEW

2,570,464

SEWING MACHINE PRESSER FOOT

Filed Aug. 24, 1949

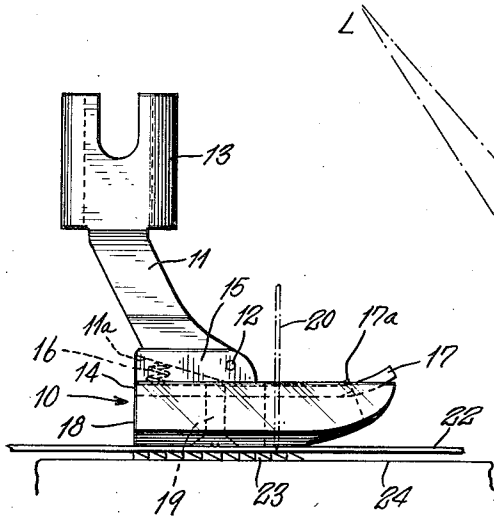


Fig. 1.

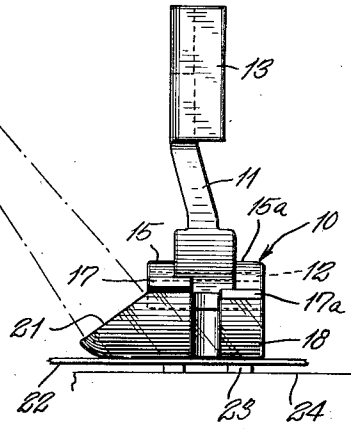


Fig. 2.

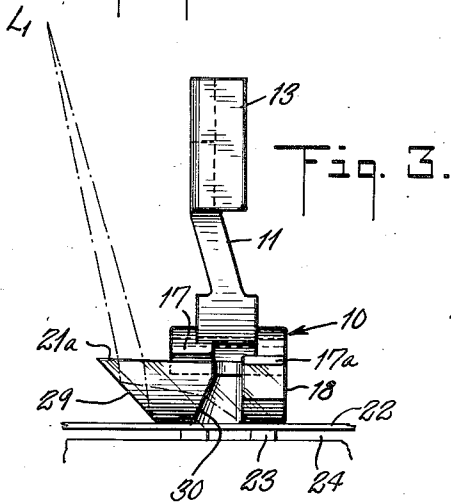


Fig. 3.

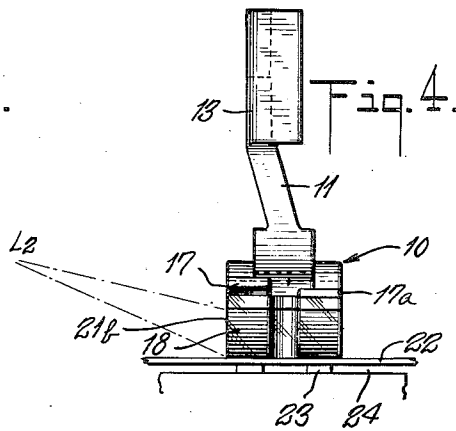


Fig. 4.

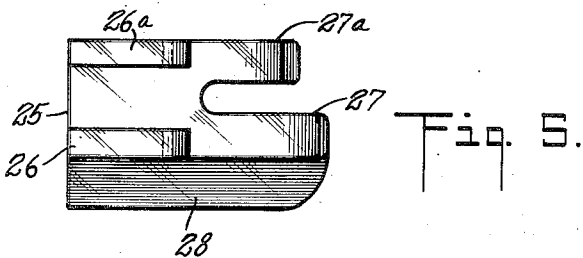


Fig. 5.

INVENTOR.
THEODORE LOEW
BY
Kenyon & Kenyon
ATTORNEYS

UNITED STATES PATENT OFFICE

2,570,464

SEWING MACHINE PRESSER FOOT

Theodore Loew, Brooklyn, N. Y., assignor to Tru-
benizing Process Corporation, New York, N. Y.,
a corporation of New York

Application August 24, 1949, Serial No. 112,139

7 Claims. (Cl. 112—235)

1

This invention relates to an improved presser foot for sewing machines.

It is an object of this invention to afford an improved presser foot for sewing machines whereby improved and more efficient illumination may be had at the point of stitching.

The presser foot that is conventionally used with sewing machines for holding the work against the feed dogs which advance the work, is made of metal and comprises a heel portion from which two toes extend forwardly with a needle accommodating space therebetween. In using such a presser foot it has always been very difficult to obtain satisfactory illumination at the point of stitching between the toes, for the parts of the presser foot intercept rays of light emanating from a source of illumination and create a shadow at the point of stitching, namely, at the point of entry of the needle into the work. This is a troublesome source of difficulty which is particularly objectionable in the case of stitching operations requiring a high degree of precision, e. g. as in accurately locating the stitching of a shirt collar in conformity to predetermined desired contours as indicated by a mark, crease, or other guide which should be accurately followed by the operator.

According to this invention, the difficulties above mentioned due to poor illumination at the point of stitching have been successfully overcome, and illumination is brought to the point of stitching by a transparent portion of the presser foot through which light rays from any convenient source of illumination can travel to the point of stitching, thus providing good illumination of the work as it passes under the presser foot to the point of entry of the needle.

Further purposes, features and advantages of this invention will be apparent from the following description of certain typical exemplary embodiments thereof in connection with the following drawings, wherein:

Fig. 1 is a side elevation of one embodiment of the improved presser foot of this invention;

Fig. 2 is a front elevation of the embodiment shown in Fig. 1;

Figs. 3 and 4 are similar to Fig. 2 showing modifications with respect to the disposition of the light-receiving surface of the transparent material comprised in the presser foot, and

Fig. 5 is a plan view of an alternative embodiment wherein the entire presser foot is composed of transparent material.

Referring to the embodiment of this invention shown in Figs. 1 and 2, the presser foot is indi-

2

cated generally by the reference character 10 and may, as in the embodiment shown, be pivoted to the support arm 11 by the pin 12. The upper end of the support arm 11 may be provided with any suitable means such as the notched member 13 whereby it may be operatively secured to the sewing machine. The presser foot 10 has a metal heel portion 14 having upstanding flanges 15 and 15a between which the opposite faces of the lower end of support arm 11 slidably fit and through which the pin 12 passes. Between the under surface 11a of the lower end of the support arm 11 and the upper surface of the heel portion 14 is a small compression spring 16 which is adapted to keep the rearward end of the heel normally depressed in the position shown. Extending forwardly from the heel portion 14 are the toes 17 and 17a which are upturned at their forward ends and one of which may be slightly longer than the other in the conventional manner.

The presser foot thus far described is typical of the type of metal presser foot that is commonly used in sewing machines for holding the work against the feed dogs of a sewing machine and the use of which is attended with the above-mentioned difficulties due to poor illumination at the point of stitching. It is to be understood that the construction of the presser foot as above described is merely illustrative and that the presser foot may take other forms of which many are commonly used, depending on the type of sewing machine employed, the work to be handled, etc.

The difficulty due to poor illumination at the point of stitching has been successively overcome according to the present invention by securing to the underside of the metal portions of the presser foot a shoe 18 as by means of the screw 19. The shoe 18 is composed of transparent material and is shaped so as to underlie the metal heel and toe portions of the presser foot. Thus the toe portions of the shoe 18 are spaced apart underneath the spaced metal toes so as to accommodate the needle 20, which is secured to the sewing machine and is operable in the usual way in the space between the toes of the presser foot. The under surface of the toes of the shoe is upturned in the usual way to facilitate entry of the work under the shoe. Laterally spaced from one of the side walls of the space between the toes of the shoe 18 is the light-receiving surface 21 which in the embodiment shown is disposed at an acute angle to the plane of the bottom of the shoe. Upon directing illumination from a light source L so that the light rays fall approximately normally on the light-receiving surface 21, the light

3

rays pass through the transparent material of the shoe 18 to the point of stitching in the space between the toes. In this manner, the light rays pass through the transparent shoe and provide very good illumination to the work 22 at the point of stitching as the work is advanced under the presser foot by the action of the feed dogs 23 that are concealed in the bed 24 of the sewing machine on which the work 22 rests.

The shoe 18 may be composed of any transparent material, by which is meant sufficient capacity for the transmission of light therethrough to afford illumination at the point of stitching by light transmitted through the material of the shoe. When the light-receiving surface of the shoe is disposed at an acute angle to the bottom of the shoe it is preferable to employ a transparent material having a relatively high index of refraction so that the light rays after entering the transparent material at an angle to the base of the shoe will more effectively be directed towards the point of stitching because of diversion from the direction of incidence resulting from internal reflection and response to refraction. An example of a preferred transparent material having a high index of refraction is transparent methyl methacrylate resin such as that commonly available on the market under the name Lucite. Such methyl methacrylate resin is likewise preferable because it is tough and wear-resisting and is not excessively brittle. Polystyrene resin is also suitable. Polystyrene resin likewise has a high index of refraction. It is extensively sold under the name Plexiglas. In addition, glass may be employed and several varieties of glass have a high index of refraction. Moreover, any other transparent material, of which many are well known, may be employed.

The presser foot shown in Fig. 3 is identical with that shown in Figs. 1 and 2 except that the light receiving surface 21a of the transparent shoe 18 is parallel or closely parallel to the plane of the bottom of the presser foot and comprises the reflecting surface 29 which is disposed at an obtuse angle, preferably about 135° to the bottom of the presser foot, so as to internally reflect the light rays entering at the surface 21a from the light source L₁ and thereby divert them as indicated from their direction of incidence and direct them toward the point of stitching. In the embodiment shown in Fig. 3 the light receiving surface 21a being parallel or substantially parallel to the bottom of the presser foot makes an angle of 0° or substantially 0° with the plane of the bottom of the presser foot and when it is stated in the claims that the illumination-receiving surface of the transparent material of the presser foot is disposed at an acute angle to the plane of the bottom of the presser foot or of the heel of the presser foot, said acute angle is to be understood as including an angle of 0° or substantially 0°. Using this embodiment the light source L₁ may be disposed so as to be almost directly or even directly over the presser foot. In the embodiment shown in Fig. 3 the side wall 30 of the needle-accommodating space is inclined outwardly from adjacent the upper portion of the needle-accommodating space so as to refract light rays emanating from the side wall 30 toward the bottom of the needle-accommodating space as shown. This feature may also be employed in the embodiments shown in Figs. 1, 2, 4 and 5.

The presser foot shown in Fig. 4 likewise is identical with that shown in Figs. 1 and 2 except that the shoe 18 directly underlies the metal portions of the presser foot and has essentially

4

the same shape. In this embodiment the light-receiving surface 21b is normal to the plane of the bottom of the presser foot and is disposed appropriately for receiving rays of light from the source L₂ close to the level of the bed of the sewing machine. The shoe as thus constructed transmits light rays directly therethrough to the point of stitching and it is largely immaterial whether or not the transparent material of which the shoe is composed does or does not have a relatively high index of refraction.

The several embodiments shown in Figs. 1, 2, 3 and 4 have been shown in order to illustrate that insofar as the light source is concerned it may be located wherever it is most convenient from the point of view of the operator for in any case the illumination can be transmitted through the transparent portion of the presser foot to the point of stitching.

Alternatively, as shown in Fig. 5, the entire presser foot may be made of transparent material such as methyl methacrylate resin, glass or the like. In this embodiment, the heel portion 25, the upstanding flanges 26 and 26a and the toes 27 and 27a correspond to the parts indicated by the reference characters 14, 15 and 15a, and 17 and 17a of Figs. 1 and 2 except that these parts instead of being made of metal are composed of the transparent material and except that the thickness of heel and toe portions may be somewhat thicker than is usual when metal is employed so as to facilitate the transmission of light rays therethrough to the point of stitching. In the embodiment shown in Fig. 5, the light-receiving surface 28 is disposed similarly to the disposition of the light-receiving surface 21 of the embodiment shown in Figs. 1 and 2, but may be disposed in any other position as desired, e. g. as illustrated in Figs. 3 and 4.

While the invention has been shown and described in connection with certain illustrative embodiments, it is to be understood that this has been done merely for purposes of exemplification and that the sewing machine presser foot of this invention may take other forms whereby, in accordance with this invention, the presser foot comprises a transparent portion adapted to transmit illumination therethrough to the point of stitching.

It is apparent that according to this invention good illumination free of objectionable shadows can be afforded at the point of stitching between the toes of a sewing machine presser foot. The improved presser foot of this invention is particularly useful when it is desired to stitch with accuracy along a crease or other mark on the surface of a fabric, and it is also useful for more conventional stitching operations where a gauge is used or more generally whenever it is desired to clearly observe and accurately control the point of entry of the needle into the work during a stitching operation.

I claim:

1. A sewing machine presser foot comprising a heel portion and forwardly projecting toes having a needle-accommodating space therebetween, said presser foot comprising transparent material communicating between a side wall of said needle-accommodating space and an external surface of said presser foot for the transmission of illumination therethrough from said external surface to said space between said toes and the surface of said side wall of said needle-accommodating space being substantially inclined outwardly from adjacent the upper portion of said

5

needle-accommodating space so as to refract light rays emanating from said surface toward the bottom of said needle-accommodating space.

2. A sewing machine presser foot comprising a heel portion having a substantially flat bottom surface and having toes projecting forwardly therefrom with a needle-accommodating space therebetween, said presser foot presenting an illumination-receiving surface along at least one side thereof disposed at an acute angle to the plane of the bottom of said heel and comprising transparent material extending between said illumination-receiving surface and said space between said toes and adapted to divert light rays falling on said illumination-receiving surface from the direction of their incidence thereon toward said space between said toes for transmitting illumination directed against said illumination-receiving surface to said space between said toes.

3. A sewing machine presser foot according to claim 2 wherein said illumination-receiving surface is approximately parallel to the plane of the bottom of said heel.

4. A sewing machine presser foot according to claim 2 wherein said transparent material is composed of methyl methacrylate resin.

5. A sewing machine presser foot comprising a heel portion of metal and forwardly projecting metal toes having a needle-accommodating space therebetween, said sewing machine presser foot comprising a shoe which is secured to the underside of said metal heel and which comprises transparent material underlying at least one of said metal toes and extending from a position substantially flush with said space between said metal toes to a laterally disposed external surface for transmission of illumination from said laterally disposed external surface underneath said metal toe to said space between said toes.

6. A sewing machine presser foot comprising a heel portion having toes projecting forwardly therefrom with a needle-accommodating space therebetween, said presser foot at least in the region of said toes comprising transparent material extending from a side wall of said needle-

6

accommodating space to an illumination-receiving surface disposed along the side portion of said presser foot in substantially spaced relation to said needle-accommodating space for transmission of illumination laterally therethrough from said illumination-receiving surface to said space between said toes and the upper surface of said transparent material being covered with substantially opaque material extending substantially from said needle-accommodating space between said toes to said illumination-receiving surface.

7. A sewing machine presser foot comprising a heel portion and forwardly projecting toes having a needle-accommodating space therebetween, said presser foot comprising transparent material communicating between a side wall of said needle-accommodating space and an external illumination-receiving surface disposed along the side portion of said presser foot oppositely to and substantially spaced from said side wall of said needle-accommodating space, said illumination-receiving surface being disposed for approximate normal incidence thereon of light rays emanating from a light source disposed above said presser foot and said transparent material being provided with a reflecting surface adapted to divert rays falling on said illumination-receiving surface from their direction of approximate normal incidence thereon laterally through said transparent material toward said space between said toes.

THEODORE LOEW.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,946,868	May	Feb. 13, 1934
2,211,331	Johanson et al.	Aug. 13, 1940

FOREIGN PATENTS

Number	Country	Date
654,308	Germany	Dec. 16, 1937
675,975	Germany	May 22, 1939