Oct. 1, 1957 K. SCHEIBEL 2,808,014

GLARE-FREE LIGHTING APPARATUS FOR TABLE TYPE EMBROIDERY MACHINES

Filed Feb. 16, 1955 2 Sheets-Sheet 1

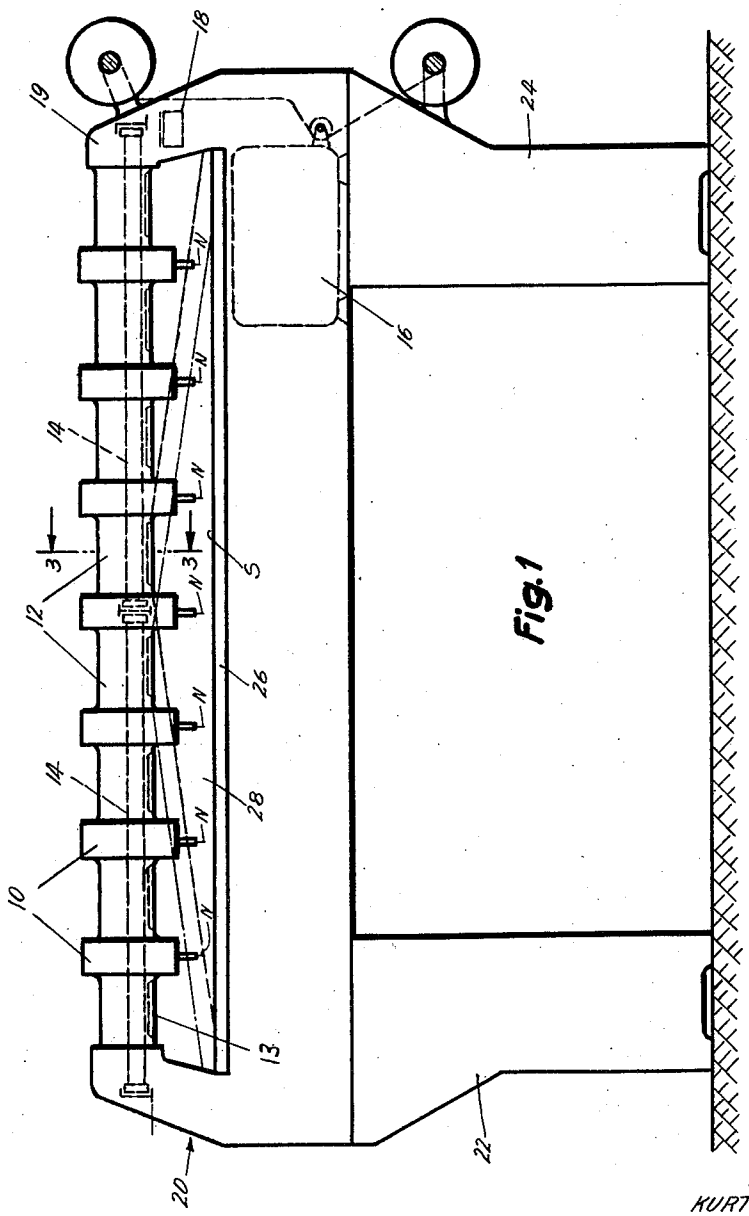

Fig. 1

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Fig. 3

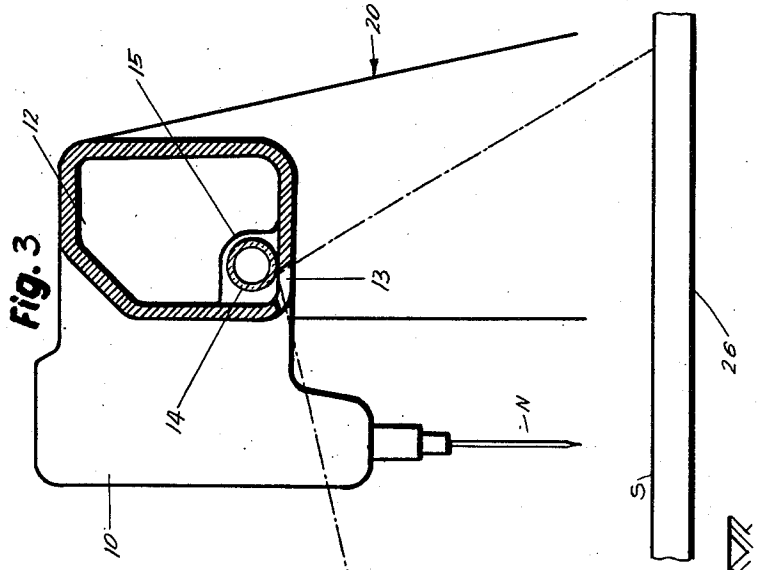
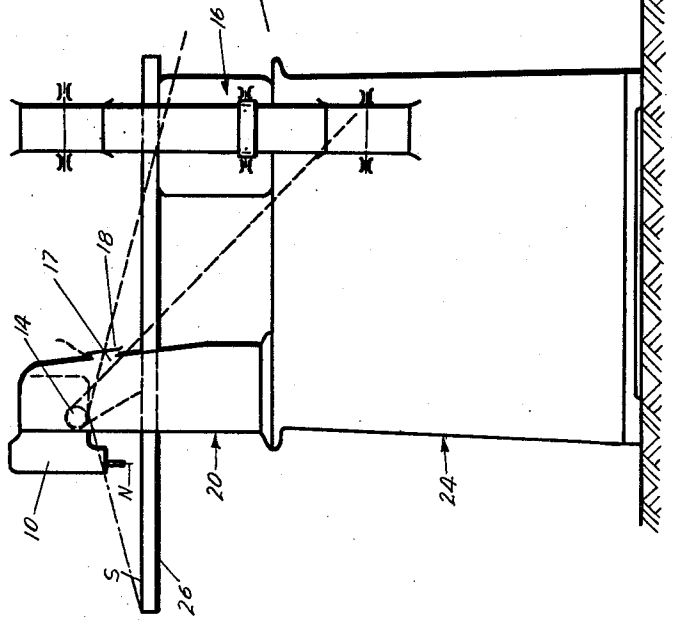


Fig. 2



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2,808,014

GLARE FREE LIGHTING APPARATUS FOR TABLE TYPE EMBROIDERY MACHINES

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6 Claims. (Cl. 112—218)

This invention relates to a glare-free lighting apparatus for embroidery machines and more particularly to a glare-free lighting apparatus for table embroidery machines having a plurality of embroidery heads.

Practical experience has shown that in table embroidery machines, and in particular those in which there are a plurality of embroidery heads, because of the large variety of patterns which each head embroiders and becauses of the distance between the individual embroidery heads, it is advisable to provide extensive illumination of the material. Thus, it is necessary to illuminate not only the material in the area immediately under the embroidery head, but also as much of the remaining material as possible. In this way small errors can be spotted with ease and corrected before they are magnified.

The desideratum of the instant invention is to overcome the shortcomings in illumination in prior table embroidery machines. This is accomplished by providing an illuminating fixture provided in a housing which extends the length of the portal carrier and beyond the endmost embroidery heads. The housing is positioned in intermediate parts of the portal carrier. Because the length of the housing is comparatively long, as is also the distance between embroidery heads, it is possible to install either one or more tubular lamps of the fluorescent kind in the housing, the number of tubes being dependent upon the length of the housing. A top shield placed in the intermediate parts of the portal carrier housing will protect the lamps from soilage and breakage while at the same time reflect the light from the lamps through glare-free apertures onto the material below.

In embroidery work wherein colored designs are made it will be of inestimable value to be able to utilize illuminating tubes which supply light equivalent to daylight. The ability to employ lamps of this kind will enhance the quality of the work and at the same time reduce the uncomfortable amount of heat generated by ordinary lighting arrangements.

Accordingly, an object of the invention is to provide a novel lighting apparatus for table embroidery machines in which it is possible to illuminate effectively large portions of the material to be embroidered.

Another object of the invention is to eliminate the heat normally generated by lighting systems in table embroidery machines by providing an apparatus for illuminating the embroidery material by substantially heat-free illuminating lamps.

A further object of the invention is to provide a lighting apparatus for table embroidery machines wherein there is a novel housing for the illuminating lamps whereby the lamps are removed from and out of the path of the working area of the machine thereby to leave the working area unobstructed.

Other and further objects of my invention reside in the structures and arrangements hereinafter more fully described with reference to the accompanying drawings in which:

Fig. 1 is a front elevational view of a portal-type embroidery machine according to the invention,

Fig. 2 is a side elevational view of the right hand end of the machine shown in Fig. 1, and

Fig. 3 is a sectional side elevation of an intermediate portion of the portal carrier of the machine taken substantially along lines 3—3 of Fig. 1.

Referring now to the drawings, **20** generally indicates a portal carrier of the embroidery machine. Said portal carrier **20** is mounted on supporting uprights **22** and **24**. A plurality of embroidery heads **10** are arranged in horizontal alignment and held at certain distances from each other by intermediate parts or spacers **12**. If desired, said intermediate parts **12** may be connected directly with each other and the embroidery heads **10** may be attached to or formed integral therewith at predetermined distances from each other. The heads **10** may be positioned either at the connections of the intermediate parts **12** or, if the intermediate parts are formed as a unitary member, the heads **10** may be attached thereto at predetermined points along the length thereof. The table **26** secured to a stationary part of the machine, for example, to the lower portion of the portal carrier **20**, passes through a passage **28** of said portal carrier from the front to the rear.

Positioned beneath the embroidery heads **10** is a table surface S which is formed as part of the table **26**. The embroidery material (not shown) is moved on the surface S beneath the needles N of the heads **10**. To illuminate the material there is provided an illuminating or light aperture **13** in each of the intermediate parts **12** of the portal carrier. The sides of the light aperture **13** are inclined to direct illumination to desired portions of the surface S and to the material which is subsequently placed thereon. The source of the illumination, namely lamps **14**, are mounted in the hollow intermediate parts **12** of the portal carrier.

Because the intermediate parts **12** of the portal carrier are relatively long the heads **10** are spaced sufficiently far apart so that the lamps **14** may be of the substantially heat-free fluorescent type. As best shown in Fig. 1, each lamp **14** may pass through a plurality of adjacent hollow intermediate parts **12**. As a result the heat generated by these elongated fluorescent lamps or tubes will be less than that generated by prior common illuminating devices. There may be as many of these tubes as is permitted by the length of the portal carrier **10** in which they are housed. However, as is more clearly shown in Fig. 1, the combined length of the lamps **14** is such as to extend beyond the endmost embroidery heads **10**. Access may be had to the lamps **14** through the portal carrier, and although it is not shown in the drawings, it may be provided for in any conventional manner.

Positioned about the fluorescent tubes **14** are covers **15** which can be provided in the instant lighting apparatus since the heat generated by the tubes is so slight. The covers **15** shield the tubes along their top and rear sides facing away from the apertures **13**, and being polished, reflect their light downwardly through the apertures **13** onto the work below.

The light projected through the apertures **13** is limited in its path by the inclined walls of the apertures and is directed as indicated by the dot-dash lines Figs. 1, 2 and 3. Due to the predetermined inclination of the walls of the apertures **13** the light is directed onto the material and away from the operator to provide a glare-free lighting apparatus. As shown by the dot-dash lines in the drawing, the apertures **13** acting as light baffles restrict the angular spread of the light beams passing therethrough from the source **14**, thus substantially encompassing the effective working area of the table **26** and providing

a glare-free system illuminating all of the necessary portions of the embroidering material.

On the side of the machine and mounted between the table **11** on the support **24**, is a customary Jacquard mechanism **16**. If it is desired to provide for illumination of this mechanism while the machine is in operation, a light aperture **17** (Figs. 1 and 2) may be provided in the right arm **19** of the portal carrier **20** at the rear side thereof. The light rays emanating from said aperture are directed to the Jacquard mechanism **16** by way of the light aperture **17** which may be closed by a cover **18**.

It will be noted that by so positioning the aperture **17**, full advantage is taken of the position of the tube, or tubes **14** while the light generated therefrom is allowed to pass through the aperture **17** to illuminate the mechanism **16**, wherein see the dot-dash lines shown in Fig. 2. If necessary, the relative position of the aperture **17** may be changed to one wherein it is placed at a point somewhere along one of the intermediate parts **12**. In that event it would be necessary to provide the aperture **17** with walls so inclined as to direct the light onto the Jacquard mechanism.

The shield or cover **18** permits the closing off of light projected through the aperture **17** when it is no longer required, thus to prevent any possibility of glare to the operator.

From the above it will be seen that applicant has provided a lighting apparatus which is housed out of the area of operation to provide an unencumbered work area while at the same time enabling the use of substantially heat-free lighting means without the necessity of supplying costly installations. The ensuing apparatus results in glare-free, low heat producing illumination which permits complete illumination of the necessary portions of the machine and work material.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

I claim:

1. In a multiple-head embroidering machine comprising a hollow elongated support carrying a plurality of needle heads in mutually spaced relation along the length thereof, a work table in spaced cooperative relation to said heads, and illuminating means within said support extending throughout the length thereof, said support having a plurality of light transmitting apertures located intermediate adjacent needle heads, said apertures being positioned in facing relationship with said table, said apertures designed to cause an angular spread of the light beams passing therethrough from said illuminating means, to substantially encompass and to illuminate the effective work table area of said machine.

2. In a multiple-head embroidering machine comprising a hollow elongaetd support carrying a plurality of needle heads in mutually equi-spaced relation along the length thereof, a work table spaced below said heads, and elongated illuminating means within said support extending throughout the length thereof and beyond the endmost needle heads, said support provided with a plurality of light transmitting apertures located intermediate any two adjacent and beyond the endmost needle heads, said apertures being positioned in facing relationship with said table, said apertures designed to cause an angular spread of the light beams passing therethrough from said illuminating means, to substantially encompass and to illuminate the effective work table area below.

3. In a multiple-head embroidering machine comprising a hollow elongated support carrying a plurality of needle heads in mutually equi-spaced relation along the length thereof, a work table spaced below said heads, tubular illuminating means within said support extending throughout the length thereof, said support being provided with a plurality of light transmitting apertures located intermediate adjacent needle heads, said apertures being positioned in facing relationship with said table, light reflecting means mounted in the interior of said support opposite said apertures, said illuminating means being positioned intermediate said reflecting means and said aperture, said reflecting means being designed to reffect light from said illuminating means through said apertures, each of said apertures designed to cause an angular spread of the light beams passing therethrough from said illuminating means, to encompass the effective work table area below and to substantially uniformly illuminate said area by the combined effect of said light beams.

4. In a multiple-head embroidering machine comprising a hollow elongated support carrying a plurality of needle heads in mutually equi-spaced relation along the length thereof, a work table spaced below said heads, and tubular illuminating means within said support extending throughout the length thereof and beyond the endmost needle heads, said support being provided with a plurality of light transmitting apertures located intermediate any two adjacent and beyond the endmost needle heads, said apertures being positioned in facing relationship with said table, light reflecting means mounted in the interior of said support opposite said apertures, said illuminating means being positioned intermediate said reflecting means and said aperture, said reflecting means being designed to reflect light from said illuminating means through said apertures, each of said apertures designed to cause an angular spread of the light beams passing therethrough from said illuminating means, to encompass the effective work table area below and to substantially uniformly illuminate said area by the combined effect of said light beams.

5. In a multiple-head embroidering machine comprising a hollow elongated support carrying a plurality of neeedle heads in mutually spaced relation along the length thereof, a work table spaced below said heads, and elongated illuminating means within said support extending throughout the length thereof, said support provided with a plurality of light transmitting apertures located intermediate adjacent needle heads, said apertures being positioned in facing relationship with said table, the size and lateral contour of said apertures designed to cause an angular spread of the light beams passing therethrough from said illuminating means, to substantially encompass and to illuminate the effective work table area below.

6. In a multiple-head embroidering machine as claimed in claim 1, including a Jacquard control device for displacing embroidery frames cooperating with said needle heads, the provision of a further aperture in said support adjacent to said illuminating means, said further aperture facing said Jacquard device and designed to pass a light beam of angular spread and direction to illuminate said Jacquard device.

References Cited in the file of this patent

UNITED STATES PATENTS

2,706,956 Peets et al. ---------- Apr. 26, 1955

FOREIGN PATENTS

8,816 Great Britain ---------- July 6, 1886