Nov. 21, 1939. L. R. HARDING 2,180,756

STITCHING MECHANISM FOR SEWING MACHINES

Filed July 24, 1937

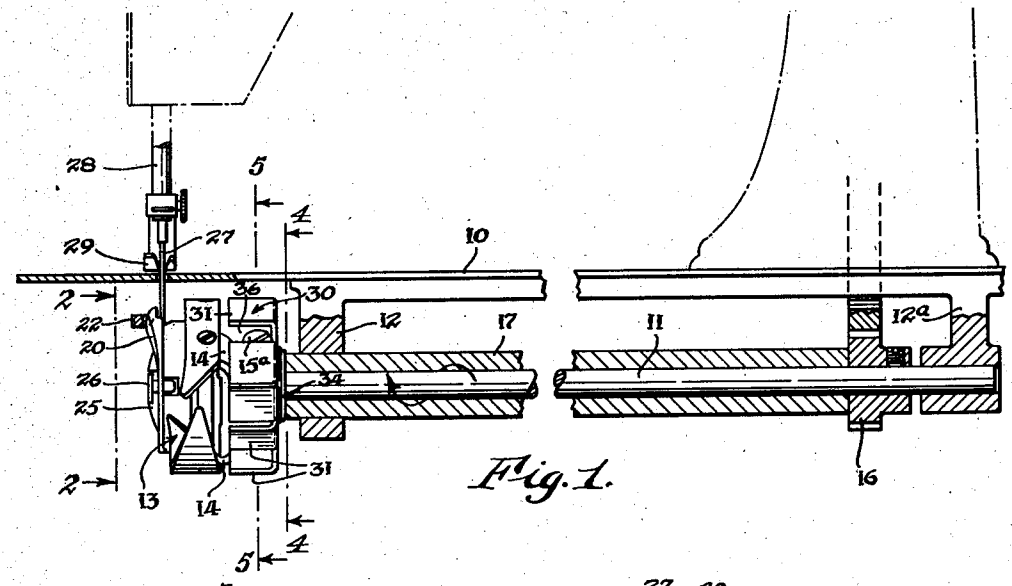

Fig. 1.

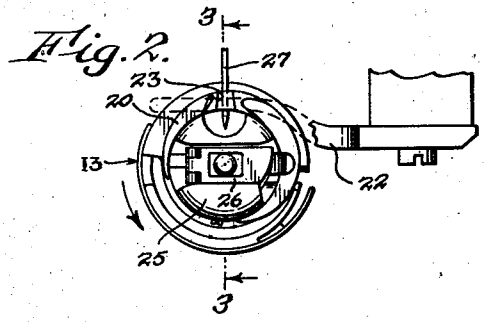

Fig. 2.

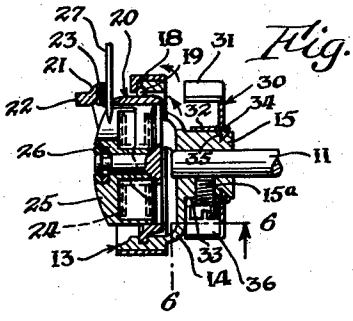

Fig. 3.

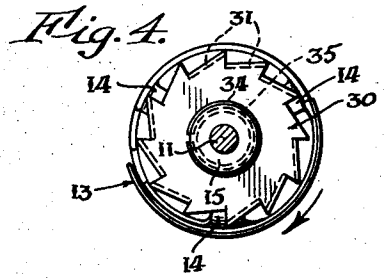

Fig. 4.

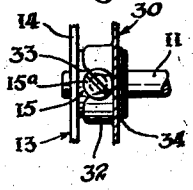

Fig. 6.

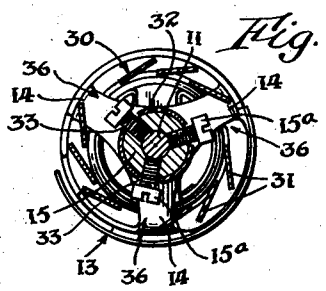

Fig. 5.

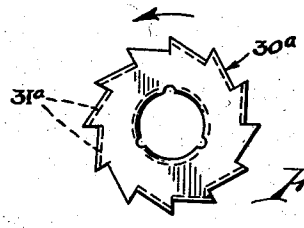

Fig. 7.

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Patented Nov. 21, 1939 2,180,756

UNITED STATES PATENT OFFICE

2,180,756

STITCHING MECHANISM FOR SEWING MACHINES

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Application July 24, 1937, Serial No. 155,484

2 Claims. (Cl. 112—218)

This invention relates to improvements in sewing machines and, although not limited to such use, is characterized by features which are particularly adapted to industrial machines, especially those of the kind in which the stitching mechanism includes a hook which is rotated at high speeds.

The principal object of the invention is a machine in which provision is made for cooling the rotary hook, shuttle, and needle and for preventing the accumulation of lint, dust and other foreign materials upon these and associated parts, this object contemplating the use of a fan which is available, if desired, as an attachment for standard types of machines.

The invention is illustrated in the accompanying drawing in which:

Figure 1 is a longitudinal section through a machine showing a stitching mechanism in which the features of the invention are incorporated.

Figure 2 is a transverse section taken along line 2—2 of Figure 1.

Figure 3 is a section taken along line 3—3 of Figure 2.

Figures 4 and 5 are vertical sections taken along lines 4—4 and 5—5, respectively, of Figure 1.

Figure 6 is a detail section taken along line 6—6 of Figure 3.

Figure 7 is an end view of a modified form of fan.

The invention is illustrated, by way of example, in connection with an industrial machine of standard design. The said machine, as illustrated, includes a bed plate 10 (Figure 1). A shaft 11 is mounted under the said bed plate in suitable blocks 12 and 12a. It carries a rotary hook 13 which is formed with arms 14 (Figures 3 and 5). The latter extend radially from a hub 15, set screws 15a which are carried by the said hub being available to secure the hook 13 to the shaft 11 in the desired position of adjustment. The shaft 11 also carries a gear 16, the said gear being one of a chain by which the shaft is connected to the driving motor. A sleeve 17 encases the shaft 11 throughout the greater part of its length, one end of the said sleeve being mounted in the block 12 while the opposite end abuts the gear 16. The rotary hook 13 is formed to provide a raceway 18 (Figure 3) for the annular rib 19 of the shuttle 20. The latter is held against rotary movement by a finger 21 which is carried by an arm 22 and which fits in a depression 23 formed in the shuttle. The bobbin 24 is arranged in a holder 25 which is removably secured in the shuttle by a latch 26. The needle, needle bar and presser foot are indicated at 27, 28 and 29, respectively.

In accordance with the invention a fan 30 is employed to cool the parts of the stitching mechanism. The said fan, as illustrated, includes forwardly directed blades 31 and is formed with a hub 32. The said hub fits over the hub 15 of the hook 13 and is formed with slots 33 which accommodate the set screws 15a. The fan 30 is removably secured upon the hub 15 by a resilient split ring 34. The latter fits in an annular groove 35 which is formed in the hub 15 and holds the body of the fan against the heads of the set screws 15a, the said set screws also serving to prevent relative angular movement between the hook and the fan. It is to be noted (Figure 5) that the blades 31 of the fan are formed in groups which are arranged to provide a space 36 opposite each of the heads of the set screws 15a. The said spaces provide for access to the set screws and hence enable adjustment of the hook 13 upon the shaft 11 without the necessity of removing or disturbing the position of the fan.

It is the practice to operate industrial machines of the character described at speeds considerably in excess of 4000 R. P. M. It will be apparent, therefore, that as the fan 30 rotates at the same speed as the hook 13 a current of air will be directed toward the said hook, a portion of the said air passing around the hook and flowing along the under side of the bed plate while a portion of it is caused to flow between the hook and the shuttle. The hook and shuttle are thus cooled as are the walls of the raceway 18. It will also be apparent that during the intervals that the needle 27 is located below the bed plate 10 it will likewise be subjected to cooling effect of the current of air created by the fan, this being particularly desirable when heavy materials are being sewed. The current of air created by the fan also serves to carry away lint, dust and other foreign materials, thereby preventing their accumulation upon the parts of the stitching mechanism. Wearing of the parts is thus minimized while at the same time soiling of the materials being worked upon is prevented.

The fan 30 may be incorporated in a machine as an original part or it may, if desired, be applied as an accessory to machines of standard design without necessitating changes in the construction of such machines or in their manner of operation. In Figure 1 the hook 13 rotates in a counter-clockwise direction, the blades of the

fan 30 being formed to direct the current of air toward the hook 13. It is understood, of course, that the blades of the fan may be of any suitable design. For example, in the embodiment of the invention shown in Figure 7 the angle of the blades 31a of the fan 30a is reverse to that of the blades of the fan shown in Figure 1. The fan 30a, therefore, is capable of producing a current of air similarly to that produced by the fan 30 when the hook of the sewing mechanism is designed to rotate in a clockwise direction.

I claim as my invention:

1. The combination with the stitching mechanism of a sewing machine, said mechanism including a hook and a shaft for rotating said hook, said hook having a hub, a set screw carried by said hub for securing said hook to said shaft, of a fan for directing a current of air against said hook and associated parts of said mechanism, said fan having a hub which fits over the hub of said hook and which is formed with a slot for accommodating said set screw and means for securing said fan to said hook.

2. The combination with the stitching mechanism of a sewing machine, said mechanism including a hook and a shaft for rotating said hook, said hook having a hub which is formed with an annular groove, of a fan for directing a current of air against said hook and associated parts of said mechanism, said fan having a hub and a resilient ring which fits in said groove to secure the hub of said fan upon the hub of said hook.

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