

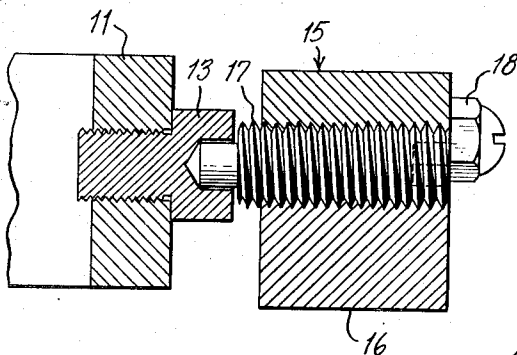
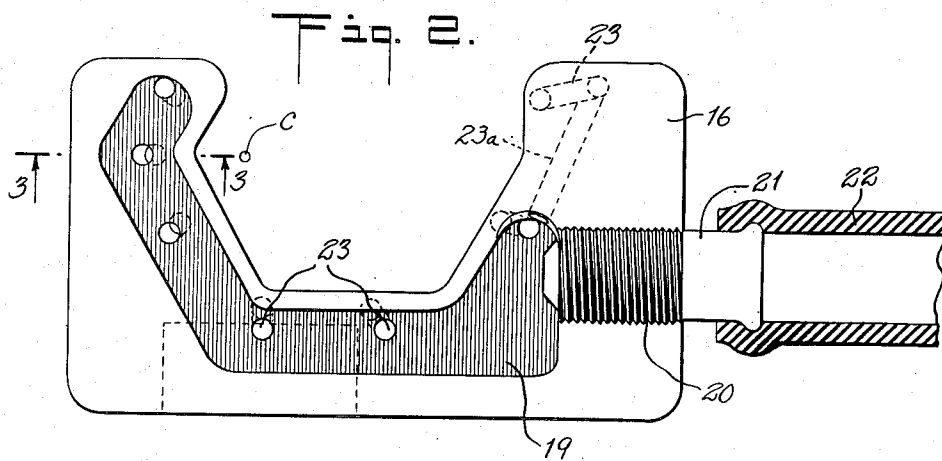
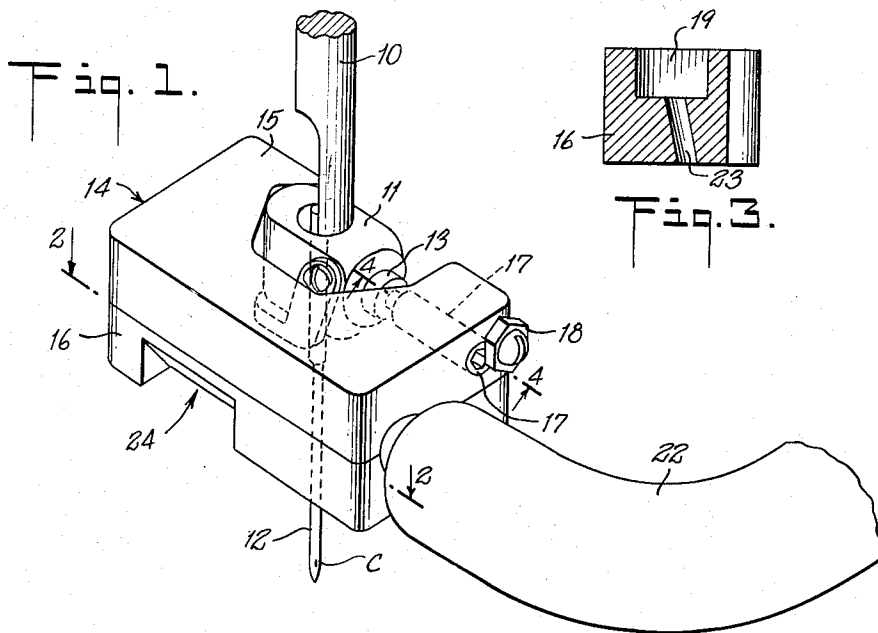
Sept. 28, 1954

F. W. ADAMS

2,690,148

SEWING MACHINE NEEDLE COOLER

Filed Nov. 10, 1951



INVENTOR
FREDERICK W. ADAMS
BY
Burgess, Ryan & Hicks
ATTORNEYS

UNITED STATES PATENT OFFICE

2,690,148

SEWING MACHINE NEEDLE COOLER

Frederick W. Adams, New York, N. Y., assignor
to Coats & Clark Inc., a corporation of Delaware

Application November 10, 1951, Serial No. 255,852

4 Claims. (Cl. 112—218)

1

The present invention relates to improvements in sewing machine needle coolers and relates, more particularly, to a detachable needle cooler for applying continuous jets of a cooling medium to the needle of a sewing machine.

An object of the present invention is to provide a device for cooling the needle of a sewing machine which may be detachably secured to the sewing machine for operation in conjunction therewith without alteration or modification of the sewing machine itself. A further object of the present invention is to provide a needle cooler which will apply continuous jets of a cooling medium to the eye of the needle and in respect thereto reference may be made to my co-pending application Serial No. 142,927, filed February 7, 1950, for "Needle Cooling Device for Sewing Machines" which describes and claims a needle cooler designed to function in this manner.

Various other objects and advantages of the present invention will be apparent and best understood from the following description and the accompanying drawings in which:

Fig. 1 is a perspective view illustrating a needle cooler embodying the present invention attached to the needle bar of a sewing machine;

Fig. 2 is a section view taken along the line 2—2 of Fig. 1;

Fig. 3 is a section view taken along the line 3—3 of Fig. 2; and

Fig. 4 is a section view taken along the line 4—4 of Fig. 1.

Referring to the drawings in detail and, in particular, to Fig. 1 thereof, there is the lower end of a needle bar 10 that is reciprocated in the usual way by a sewing machine. The reciprocating needle bar 10 carries the usual needle clamp 11 and a sewing needle 12 is secured in the needle clamp 11 by a needle clamp screw 13.

A needle cooling device is detachably secured to the needle clamp 11 and reciprocates therewith upon reciprocation of the needle bar 10. The needle cooling device includes a hollow or chambered body 14 which consists of two portions, an upper half 15 and a lower half 16. The upper half 15 is suitably joined to the lower half 16 in mating relation and with the mating faces forming a seal. The hollow body 14 is C-shaped and when it is installed on the needle clamp 11, one of the arms thereof extends around the needle clamp and is held in engagement therewith by means of a set screw 17 which is threaded in the body and which when tightened bears against the head of the needle clamp screw 13.

In order to prevent movement of the needle

2

cooler relative to the needle bar during reciprocation thereof, the end of the set screw 17 fits into a recess in the head of the needle clamp screw 13. In addition, the set screw 17 may be held in place by a lock screw or nut 18.

In the illustrated embodiment, the lower half 16 of the hollow body 14 contains a chamber or recess 19 which has an inlet 20 communicating therewith. An inlet fitting 20 is threaded in the inlet 20 and has a portion 21 which projects beyond one side of the hollow body 14. A flexible hose 22 is connected to the portion 21 of the inlet fitting 20 and communicates with a supply of cooling medium under pressure and thus supplies the chamber 19 in the hollow body with a continuous supply of the cooling medium under pressure.

The chamber 19 communicates with a series of spaced jet outlet passageways 23 in the body which have openings in the bottom face of the lower half 16 of the hollow body 14. The chamber 19 communicates directly with the passageways 23 in the center and one arm of the C-shaped body 14 and communicates with one of the passageways 23 in the other arm of the body through a passageway 23a.

The outlet passageways 23 are inclined so that they converge upon a common point C that is spaced both downwardly and inwardly with respect to the hollow body 14. The point C at which the passageways 23 converge is the point at which the eye of the needle 12 is located when the needle is secured in place by the needle clamp 13 and the hollow body 14 is attached thereto.

The inclined converging passageways 23 are relatively small in diameter as compared to the inlet fitting 20 and are designed so that continuous jets of the cooling medium are directed toward and impinge upon the needle 12 at the eye thereof. Thus, the maximum cooling is effected at the eye of the needle which is the point where the thread contacts with the needle and is most damaged or broken by the heat generated in sewing. The passageways 23 are preferably of such length and diameter and pressure of the cooling medium supplied to the chamber 19 is such that there is a turbulent flow of the cooling medium in the streams or jets of the cooling medium which emerge from the passageways 23 and the jets maintain a substantially uniform cross-section until they impinge upon the eye of the needle. To obtain the maximum cooling effect, the length of the outlet passageways 23 should be from three to five times their diameter and their diameter should be as small as possible.

3

The lower half 16 of the body 14 may also be beveled or cut away as opposite the needle as indicated at 24 so that the needle cooler will not interfere with the passage of the goods to be sewn or with the handling thereof.

It will be understood that various modifications may be made in the embodiment of the invention illustrated herein without departing from the scope of the invention as defined by the following claims.

I claim:

1. In a device for continuously cooling the needle of a sewing machine, the combination comprising a vertically reciprocable needle bar, a needle clamp carried by the needle bar at one end thereof, a sewing needle secured in the needle clamp and extending beyond the said one end of the needle bar, a chambered body detachably secured to the needle clamp and having portions extending at least partially around the needle clamp, said body having an inlet connected to a source of a cooling medium under pressure and a plurality of inclined passageways communicating with outlets in one face thereof, said passageways being spaced about the axis of the needle carried by the needle clamp, each of said passageways being inclined to direct a jet of the cooling medium toward the needle at a point spaced from the needle clamp.

2. In a device for cooling the needle of a sewing machine, the combination as defined in claim 1 wherein the passageways in the chambered body are inclined to direct converging jets of the cooling medium against an eye in the needle.

3. In a device for continuously cooling the

4

needle of a sewing machine, the combination comprising a vertically reciprocable needle bar, a sewing needle extending from the needle bar at one end thereof, a needle clamp secured to said end of the needle bar, a set screw carried by said clamp and engaging with the needle, a C-shaped chambered body extending around the needle clamp, means for detachably securing said body to the needle clamp, said chambered body having an inlet therein and having a plurality of inclined passageways communicating with outlets in one face of the body, said passageways being spaced about the axis of the needle carried by the needle clamp, each of said passageways being inclined to direct a jet of the cooling medium toward the needle, said jets converging at a common point spaced from the needle clamp.

4. In a device for continuously cooling the needle of a sewing machine, the combination as defined in claim 3 wherein the means for detachably securing the C-shaped body to the needle clamp includes a set screw extending through one arm of the C-shaped body and engaging with the set screw in the needle clamping member.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,080,322	Le Vesconte	May 11, 1937
2,163,687	Jacobsen	June 27, 1939
2,316,647	Giglio	Apr. 13, 1943
2,593,203	Schwartz	Apr. 15, 1952