

J. FUNKEN.
APPARATUS FOR TEMPERING NEEDLES.

(Application filed Dec. 8, 1900.)

(No Model.)

Fig. I. Section $\approx$ A-B.

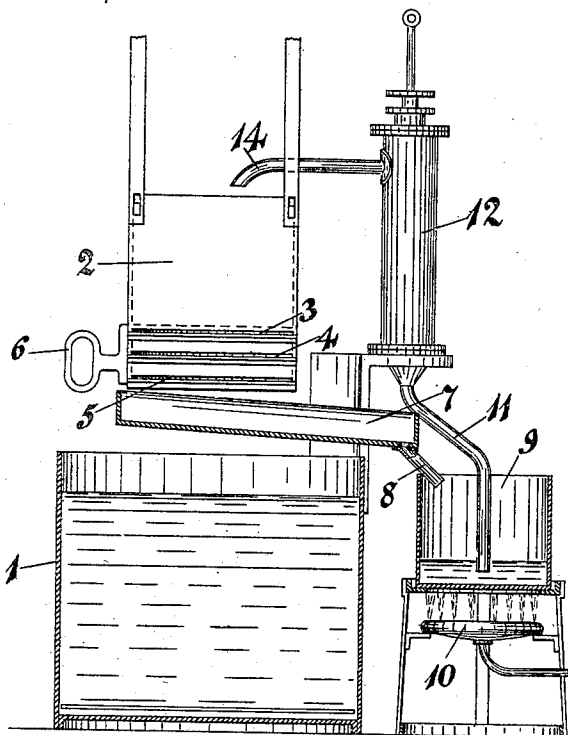
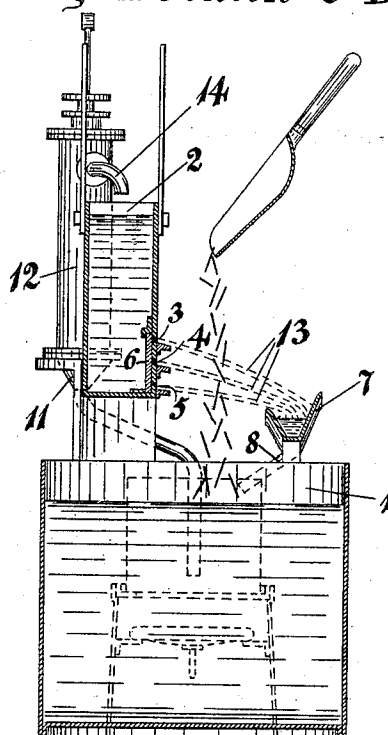
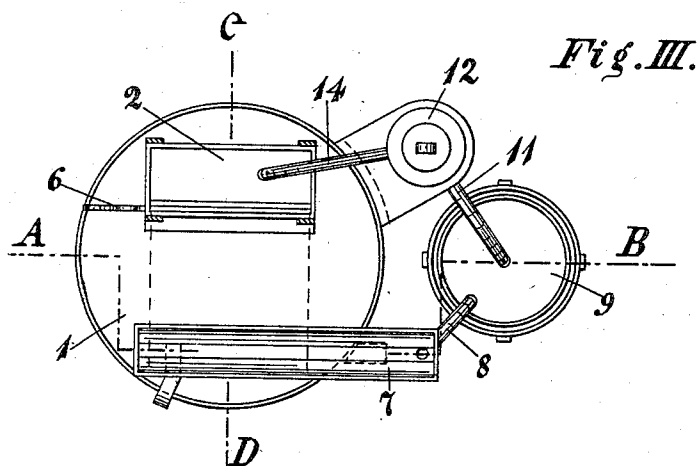


Fig. II. Section $\approx$ C-D.



Witnesses
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TEMPERING NEEDLES.

SPECIFICATION forming part of Letters Patent No. 696,033, dated March 25, 1902

Application filed December 8, 1900. Serial No. 39,203. (No model.)

To all whom it may concern:

Be it known that I, JOHANN FUNKEN, a subject of the Emperor of Germany, residing at No. 16 Johanniterstrasse, Aachen, in the Empire of Germany, have invented a new and useful Improvement in Apparatus for Tempering Needles, of which the following is a specification.

The present invention relates to the process which has for its object the hardening of sewing and sewing-machine needles and the like. It is well known that these articles are tempered, such an operation being essential to the manufacture; but the difficulty arises that needles and similar steel articles tend to become crooked in the hardening, which necessitates each one being straightened by hand afterward. This has hitherto been regarded as a necessary evil, and all attempts to prevent the needles becoming crooked in the hardening have failed and led to no result. The present invention is a device for preventing this defect.

I start with the consideration that the needles become crooked by being taken red-hot out of the hardening-furnace and suddenly plunged into the cold-oil and that this causes the distortion of the needles. This has been ascertained by experiments. In order to obviate this and prevent the needles becoming crooked, the apparatus herein described does not allow the red-hot needles to be cooled suddenly, but effects the cooling from red heat to ordinary temperature uniformly. The red-hot articles are first passed through heated oil and are then dropped into the hardening-oil.

The apparatus is illustrated in the accompanying drawings in Figures 1, 2, and 3.

Fig. 1 is a longitudinal section. Fig. 2 is a transverse section, and Fig. 3 a view from above.

At some height above the reservoir 1, filled with hardening-oil, is suspended from the ceiling of the room a vessel 2, which has at the bottom of the side turned toward the center of the reservoir 1 horizontal slots 3, 4, and 5. These can be opened or shut by means of an inside damper 6. The inclined channel 7, separated from the vessel 2 by a space, rests at some distance from the upper edge of the reservoir, which channel, closed at both ends,

has at the lowest end a waste-pipe 8, which passes into a boiler 9, in which oil can be heated by means of a heating device 10, placed underneath. The suction-pipe 11 of a pump 12 also opens into this boiler 9, the outlet-pipe 14 of the pump discharging into the aforesaid vessel 2. The oil heated in the boiler 9 by means of the heating device 10 can therefore be pumped into the vessel 2, from whence it flows in wide sheets 13 through the slots 3, 4, and 5, Figs. 2 and 3, by drawing out the slide 6, and is caught by the channel 7 and conducted back again to the boiler 9 through the waste-pipe 8.

The process of hardening is as follows: The oil when sufficiently heated in the boiler 9 is pumped into the vessel 2 before each hardening process. Before the needles or the like steel articles are taken in a red-hot condition, with the pan, out of the hardening-furnace the hot oil is pumped out of the boiler 9 into the vessel 2, the slots 3, 4, and 5 being covered by the slide 6. On drawing out the latter hot oil flows out in wide sheets 13 into the channel 7. The pan, with the red-hot articles, is now placed over these hot sheets of oil 13 and tipped in, so that the articles are first passed into it and then into the cold hardening-oil.

It is obvious that the red-hot needles or the like cannot become distorted by first being dipped in the hot sheets of oil 13 and then into the cold oil in the reservoir 1, as they would if immediately placed in the latter in a red-hot condition. The change from red heat to cold by passing through the sheets of heated oil is effected gradually, and therefore a sudden cooling of the needles does not take place. Consequently the needles do not become crooked, and the defects arising therefrom, which quite spoil the manufactured article, are thereby obviated.

What I claim is—

1. Apparatus for hardening needles in oil comprising an oil-reservoir, means for heating and supplying oil thereto, a hot-oil tank, slots in the lower part of said tank, an adjustable slide capable of regulating the flow of oil through said slots, an inclined channel adapted to receive the heated oil from said tank and a storage-reservoir for oil, substantially as set forth.

2. In apparatus for hardening needles in oil, the storage-reservoir 1, the heating-tank 9, the burner 10 underneath said heating-tank, the feed vessel 12 located above the said
5 heating-tank and adapted to draw hot oil from it, the hot-oil tank 2 adapted to receive supply from the feed vessel 12, slots 3 and 4 in said tank 2, the slide 6 adapted to open or close said slots, the channel 7 receiving the outflow

from the tank 2 and the exit-pipe 8 returning the oil to the heating-tank 9.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHANN FUNKEN.

Witnesses:

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G. SCOTT.