

(No Model.)

F. WILKINSON.
MANUFACTURE OF WIRE CARD CLOTHING.

No. 579,624.

Patented Mar. 30, 1897.

FIG. 1.

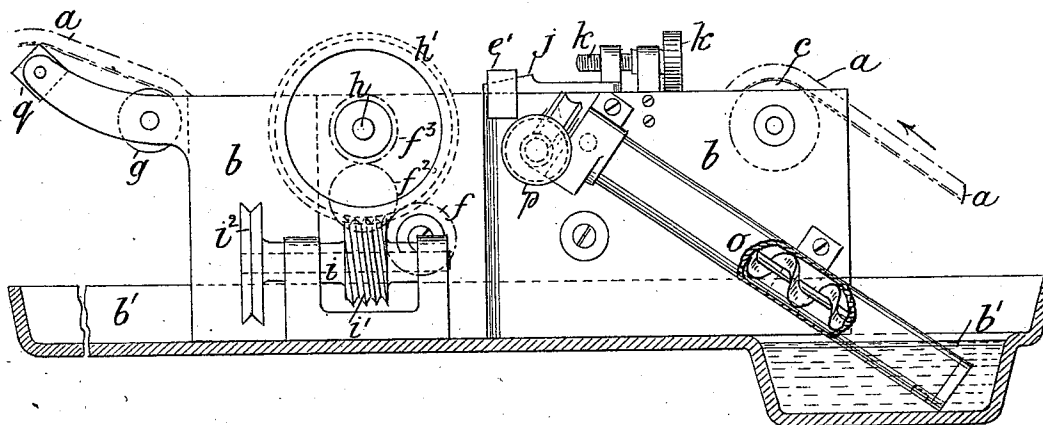


FIG. 2.

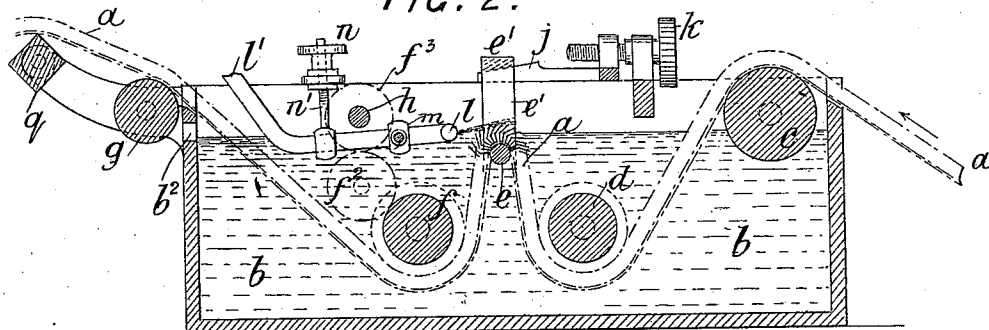
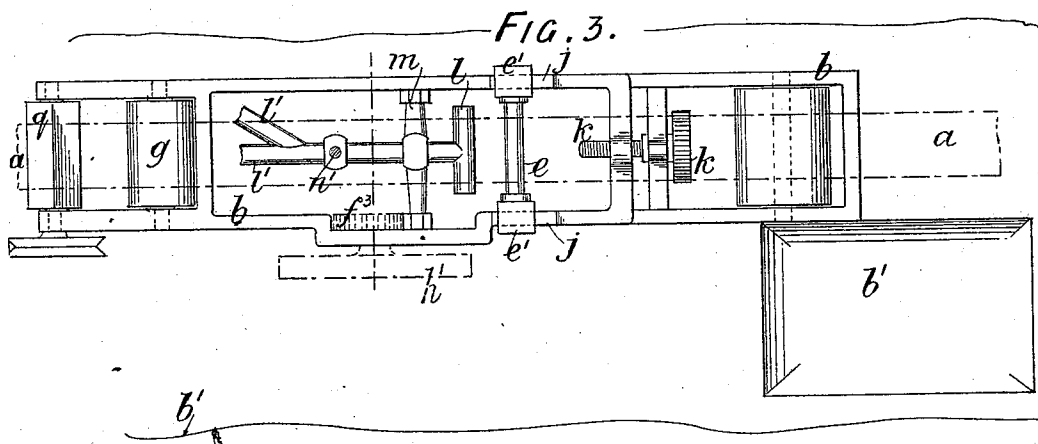


FIG. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK WILKINSON, OF MANCHESTER, ENGLAND, ASSIGNOR OF ONE-THIRD TO THOMAS STROVER TURNBULL, OF SAME PLACE.

MANUFACTURE OF WIRE CARD-CLOTHING.

SPECIFICATION forming part of Letters Patent No. 579,624, dated March 30, 1897.

Application filed August 21, 1896. Serial No. 603,530. (No model.) Patented in England February 23, 1894, No. 3,879; in Belgium December 15, 1894, No. 113,210; in France December 15, 1894, No. 243,666, and in Germany December 15, 1894, No. 84,411.

To all whom it may concern:

Be it known that I, FREDERICK WILKINSON, a subject of the Queen of Great Britain, residing at India Buildings, Cross Street, Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in and in the Manufacture of Wire Card-Clothing, (for which I have obtained Letters Patent in the following countries: Great Britain, No. 3,879, dated February 23, 1894; Belgium, No. 113,210, dated December 15, 1894; France, No. 243,666, dated December 15, 1894, and Germany, No. 84,411, dated December 15, 1894,) of which the following is a specification.

My invention relates to improvements in wire card-clothing; and it consists, chiefly, in chilling or hardening and tempering the points of the wire teeth after they have been set in the foundation, so as to produce card-clothing with wire teeth having carding-points of high temper and shanks and bases of comparatively soft or low temper.

In carrying my invention into effect I first fill up the interstices between the wire teeth on the card-clothing to the required height with a suitable substance or material which will readily absorb heat. I then subject the uncovered tips or points of the wire teeth to the action of heat, after which the tips or points are chilled.

In the accompanying sheet of drawings, Figure 1 is a side elevation, partly in section. Fig. 2 is a longitudinal section; and Fig. 3 is a plan, with some of the parts omitted, of a convenient construction of machine for hardening the tips or points of wire card-teeth.

In the views, *a* designates the strip or fillet of wire card-clothing, which is conducted through a tank *b*, over a roller *c*, under a card-clothed or other suitable roller *d*, up over a small roller *e*, down under a second card-clothed or other suitable roller *f*, and out of the tank *b* over a roller *g*. The fillet *a* is drawn through the machine in any convenient way, as, for example, by driving the second card-clothed roller *f*, which is effected, as shown, by the gears *f*¹, *f*², *f*³, the last being mounted on a shaft *h*, on which is fixed a

worm-wheel *h'*, driven by a worm *i* on a shaft *i*¹, which is driven by means of the grooved pulley *i*² or in any other suitable way. The tank *b* is nearly filled with mercury, which in practice I find to be the most suitable substance to employ, as it is a good conductor of heat, it does not adhere to the wire teeth or to the foundation, and it is clean and easy to handle. The fillet *a*, as it travels through the tank *b*, is preferably wholly immersed in the mercury except at the point where it passes over the roller *e*, where the tips or points only of the wire teeth are allowed to appear above the level of the mercury, as clearly shown in Fig. 2.

To regulate the depth of immersion at this point, the roller *e* is mounted in bearings in an adjustable bracket *e'*, which can be raised and lowered by two wedges *j*, connected together and moved to and fro on the edges of the tank *b* by a thumb-screw *k*. The roller *e* is of small diameter, so as to open out and expose the tips or points of the wire teeth to the action of a flame of high temperature directed upon them at this point. This flame is obtained from a series of atmospheric gas-burners *l*, which are pivoted on a stud *m* and are supplied with gas and air through the pipes *l'*. The burners *l* can be adjusted by means of a screwed rod *n'* and nut *n* to regulate the direction of the flame and its action on the exposed tips of the card-teeth. The card-clothing being in motion and the mercury being a rapid absorber of heat, the high temperature imparted to the tips or points is not communicated to the shanks and bases of the teeth, which therefore remain practically at the same temper, whereas the tips or points after exposure to the flame being immediately submerged in the mercury are rapidly chilled and hardened.

To maintain the mercury as far as practicable at one uniform temperature, it is necessary to keep it constantly circulating, and this may be effected in a variety of ways, as, for example, by means of an Archimedean screw *o*, which is driven by a worm and worm-wheel from a band-pulley *p*. The lower end of the screw *o* lies in a well *b'*, and the screw

o raises the mercury from this well *b'* and discharges it again through an opening in the side near the top of the tank *b* and preferably close to where the teeth are chilled. The mercury in the tank *b* overflows through an opening *b''* in the end of the tank and falls into a tray *b'* in communication with the well.

To free the card-clothing from any mercury that might possibly remain upon it, a revolving or oscillating wiper shaft or jigger *q* may be fitted outside the tank *b*, so as to agitate the fillet *a* and cause any mercury still present to run back into the tank.

I have shown and described what I believe to be a convenient arrangement of parts and the most suitable method of and means for carrying into effect my invention, the essential feature of which consists, as already stated, in chilling or hardening and tempering the tips or points only of wire card-teeth after the teeth have been set in the foundation of the card clothing or filleting and preferably after they have been ground, whereby I obtain card-clothing, the wire teeth of which have carding-points of high temper, while the shanks and bases remain of comparatively soft or low temper.

I wish it to be clearly understood, however, that I do not intend or wish to limit myself to such arrangement or to the particular method of and means herein specified, as various modifications and alternatives might be employed without departing from the essential feature of my inventions as above defined.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. The herein-described process of making wire card-clothing, consisting in first embed-

ding the teeth in the base or strip, then immersing the teeth and strip in a mercury-bath, leaving the points of the teeth exposed, and then heating and chilling the said exposed points, without treating the shanks, substantially as described.

2. The herein-described process of making card-clothing consisting in embedding the carding-teeth in the strip or base, then immersing the teeth and strip in a mercury-bath leaving the points of the teeth exposed, heating said points and then passing the strip into the bath to cause the heated points to be chilled thereby, substantially as described.

3. The combination in an apparatus for hardening wire card-clothing, of a bath for chilling the carding-teeth, heating means adapted to heat the exposed points of the teeth, and means for guiding the card-clothing past the heating means and through the bath, substantially as described.

4. In combination, the mercury-bath and guide-roller over which the card-clothing is passed, said roller being arranged to hold the points of the teeth slightly above the surface of the bath, and a burner or heating device arranged to heat the exposed points of the teeth without treating the shanks, substantially as described.

5. In combination, the bath, the overflow-tray about the bath, the guiding means for the flexible card-clothing, heating means for heating the exposed points of the teeth, and means for returning the material of the bath from the overflow-tray back into the bath, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

FREDERICK WILKINSON.

Witnesses:

S. W. GILLETT,
HERBERT R. ABBEY.