

J. ABRAHAMSEN & J. KIERKEGAARD.

HAIR PIN MACHINE.

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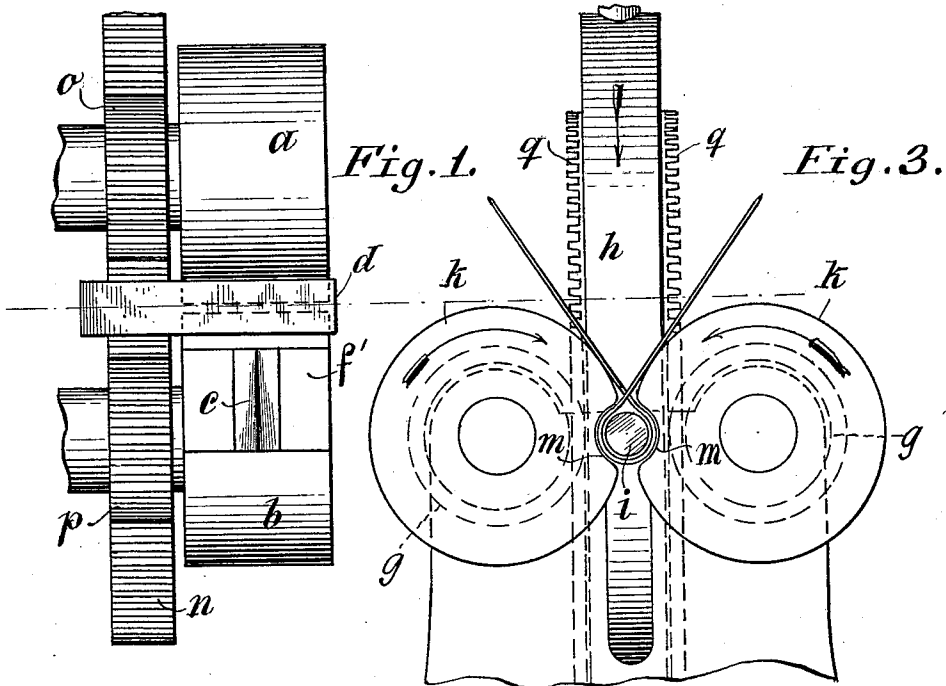


Fig. 2

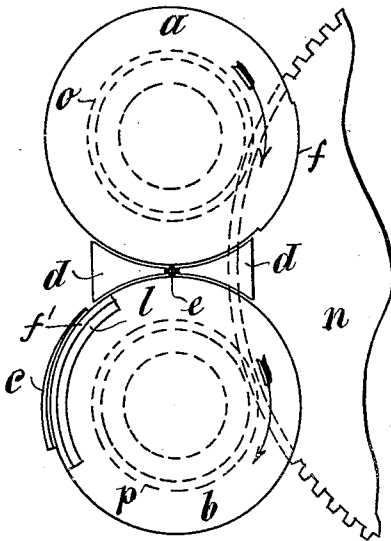
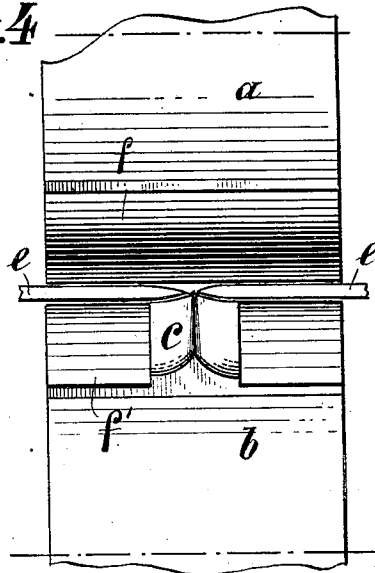


Fig. 4



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UNITED STATES PATENT OFFICE.

JENS ABRAHAMSEN AND JOHANNES KIERKEGAARD, OF COPENHAGEN, DENMARK.

HAIR-PIN MACHINE.

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Specification of Letters Patent.

Patented Apr. 8, 1913.

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To all whom it may concern:

Be it known that we, JENS ABRAHAMSEN and JOHANNES KIERKEGAARD, merchants, residing at Studiestræde 24, Copenhagen, in the Kingdom of Denmark, have invented a new and useful Hair-Pin Machine, of which the following is a specification.

Our present invention relates to a machine for the manufacture of hair pins, in which the material from which such are formed, is cut into suitable lengths and the adjacent ends of the material simultaneously formed to provide the desired contour for the finished product, followed by the bending of the material to eject it from the machine in a completed finished form.

One of the objects of our invention is to so dispose the several elements of the machine so as to not encumber the same with numerous drive wheels, but to reduce the number of parts to a minimum, and to so mount certain elements, subjected to certain stresses, that they are adapted to counteract such stresses without undue wear and tear upon the machine.

In the drawings forming a part of this specification:—Figure 1 is a side elevation of the cutting and end forming mechanism. Fig. 2 is a fragmentary front elevation of the mechanism disclosed in Fig. 1. Fig. 3 is a view in elevation of the bending or forming mechanism. Fig. 4 is a view, on an enlarged scale, of a portion of the cutting and end forming mechanism.

Similar characters refer to similar parts throughout the views.

In the drawing, and with particular reference to Figs. 1, 2, and 4 showing the cutting and end forming mechanism, *a* and *b* designate two coacting wheels arranged with their respective disks in substantially the same plane, but spaced apart from each other. These wheels *a* and *b* are adapted to be simultaneously driven in the same direction, as indicated by arrows, by pinions *o* and *p* carried concentric with the respective wheels, both pinions being driven by a common gear *n*. The material, from which the pin is formed, designated by *c*, is fed transversely of the peripheries of the wheels *a* and *b* at that space where the peripheries are in closest proximity and is guided at such place by means of guide blocks *d*.

The wheels *a* and *b* are so spaced apart from each other, as shown in Fig. 4, that the wire may be normally fed therebetween as described, without undesirable effect upon the wire due to rotation of the wheels; however, the wheels *a* and *b* are provided with offset portions *f* and *f'* respectively, which are so disposed as to approach and pass each other at the guided position of the wire, during rotation of the wheel, or in other words, at the diametrical axis common to both wheels. The portions *f* and *f'* are offset from the peripheries of their respective wheels such that they contact with the wire and rotate it about its longitudinal axis. Offset portion *f'* is provided with a knife *e* gradually rising from such portion rearwardly with respect to the direction of rotation of the respective wheel it is carried by. The knife *e* is flared out or formed symmetrically, or otherwise, on either side of its edge to shape the end of the pin material as described, and as shown in Fig. 4, is so formed as to sever the wire and provide somewhat tapered ends for the pin material.

In order to better adapt the knife to serve its purpose and for reducing the wear and tear upon the machine, we may find it desirable to mount offset portion *f'* on a suitable cushion *l*, of leather, rubber, or other resilient elements, whereby the knife may have a limited latitude of movement to overcome the strain it is subjected to, consistent with a function in connection with the machine.

As disclosed in Figs. 1 and 3, the relative portions of the cutting and end forming mechanism, and the pin forming mechanism, respectively, are preferably alined so that the pin leaving the former mechanism is led directly to the latter mechanism. In connection with Figs. 1 and 3, the dot and dash line indicates the path of travel of the pin blank from one mechanism to the other. With particular reference to Fig. 3 of the drawing, this forming mechanism includes two coacting complementary wheels *k* moving in opposite directions, as indicated by arrows, and which are provided with recesses *m* for a purpose to be subsequently described.

Operating with its axis substantially at

right angles to the planes of wheels k , is a wheel h provided with crown gears (q) or their equivalent, at each face thereof, such crown gears being adapted to rotate gears indicated at g for driving the wheels k , hereinbefore described, at an equal ratio.

The wheel h has mounted on its periphery what we term a die pin i , or it may be provided with a plurality of such pins, the position of the pin or pins i being such as to position itself in between the before-mentioned recesses m whenever the wheels k have made a complete revolution and the recesses are disposed in alinement with each other at a line drawn diametrically through wheels k and passing through both centers thereof. In other words, the drive of the wheel h , through crown gears (q) and gears g to wheels k is such as to provide the hereinbefore mentioned positioning of die pin i , and recesses m , simultaneously. The die pin i and recesses m are formed complementary to shape the head of the hair pin, while the peripheries of the wheels k position the projections of the head.

The operation of the device is as follows: The wire is fed to the cutting and end forming mechanism at a rate to cut the same into the desired uniform lengths, the feed being at a rate proportionate to the co-acting cutting positioning of the off-set portions f and f' , so that a wire body of predetermined length issues from such mechanism with its ends suitably formed. The wire body is then transported to the forming mechanism and positioned above wheels k with its central portion in alinement with the path of movement of die pins i . As the wheels h and k rotate, the pin i carries the wire body into the complementarily formed recesses m , forming the hair pin head and continued rotation of the members draws the projections from the head into the desired position, with respect to each other, parallel, diverging or converging with respect to each other, according to the resiliency of the wire and the position of the wheels k .

We claim:

1. A hairpin machine comprising in combination, means for severing the pin material into bodies of predetermined length and forming the ends of the bodies, a pair of disk like members revoluble toward and with their peripheries adjacent each other, provided with coacting forming recesses in the peripheries thereof adapted to complement each other when adjacent to each other at the diametrical axis common to both disks, said disks being alined with respect to said severing and end forming means to receive the bodies upon their peripheries, and a die adapted to engage the said bodies centrally of their ends and coacting with the said recesses of said forming members to shape the pin.

2. A device for forming hairpins from bodies of predetermined length, comprising in combination, two wheels rotatable toward each other and provided with coacting peripheral forming recesses adapted to complement each other when adjacent to each other at the diametrical axis common to both wheels, another wheel revoluble at substantially right angles to the plane of rotation of said first-mentioned wheels, radially extending die pins carried by said second-mentioned wheel for coaction with the said forming recesses of said first-mentioned wheels, to form the head of the pin, and means providing relative movement between said second-mentioned wheels and said first-mentioned wheels to position one of said die pins in operative relation to the said recesses at predetermined periods.

3. A device for cutting and forming the ends of wire bodies comprising in combination, a wheel, a severing and forming knife carried by said wheel at the periphery thereof, a second wheel for coaction with said severing and forming knife to peripherally engage and position the wire to be cut by contact with the latter, means for rotating said wheels in the same direction, and means retaining the wire against lateral movement but permitting circumferential movement thereof while acted upon by said severing and forming knife.

4. A device for cutting and forming the ends of wire bodies, comprising in combination, a wheel, severing and forming means, means yieldably mounting said severing and forming means at the periphery of said wheel, a second wheel with its periphery in close proximity to the periphery of said first-mentioned wheel and provided with an off-set portion on its periphery, means for rotating said wheels in the same direction, the said severing and forming means and offset portion being disposed with respect to their relative wheels to approach and pass each other during rotation of the said wheels, at the diametrical axis common to both said wheels, to simultaneously sever and form the ends of the wire, and means for retaining said wire against lateral displacement but permitting circumferential movement thereof when acted upon by said severing and forming means.

5. A device for cutting and forming the ends of wire bodies comprising in combination, a wheel, a severing and forming knife carried at the periphery of said wheel, a second wheel with its periphery in close proximity to the periphery of said first-mentioned wheel and provided with an offset portion at its periphery adapted to coact with said knife, mechanism for rotating said wheels in the same direction, said severing and forming knife and offset portion being disposed on their respective wheels to ap-

proach and pass each other, during rotation
of said wheels, at the diametrical axis com-
mon to both wheels, to simultaneously sever
and form the ends of the wire, and means
5 for retaining said wire against lateral dis-
placement but permitting circumferential
movement thereof when acted upon by said
severing and forming means.

In testimony whereof we affix our signa-
tures in presence of two witnesses.

JENS ABRAHAMSEN.

JOHANNES KIERKEGAARD.

Witnesses:

HANS PEDERSEN,
ADOLF LARSEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."