(No Model.) 4 Sheets—Sheet 1.

C. P. MARIN.

FELTING MACHINE.

No. 248,660 Patented Oct. 25, 1881.

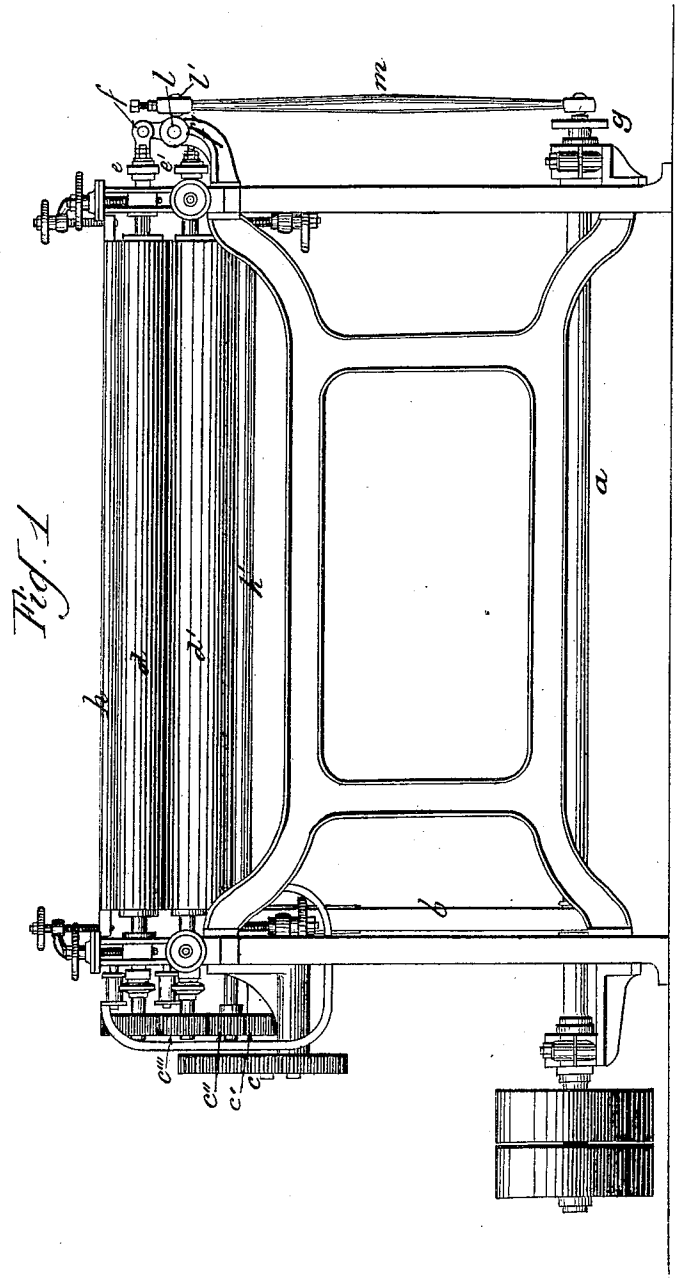


Fig. 1.

Witnesses:

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N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 4 Sheets—Sheet 2.

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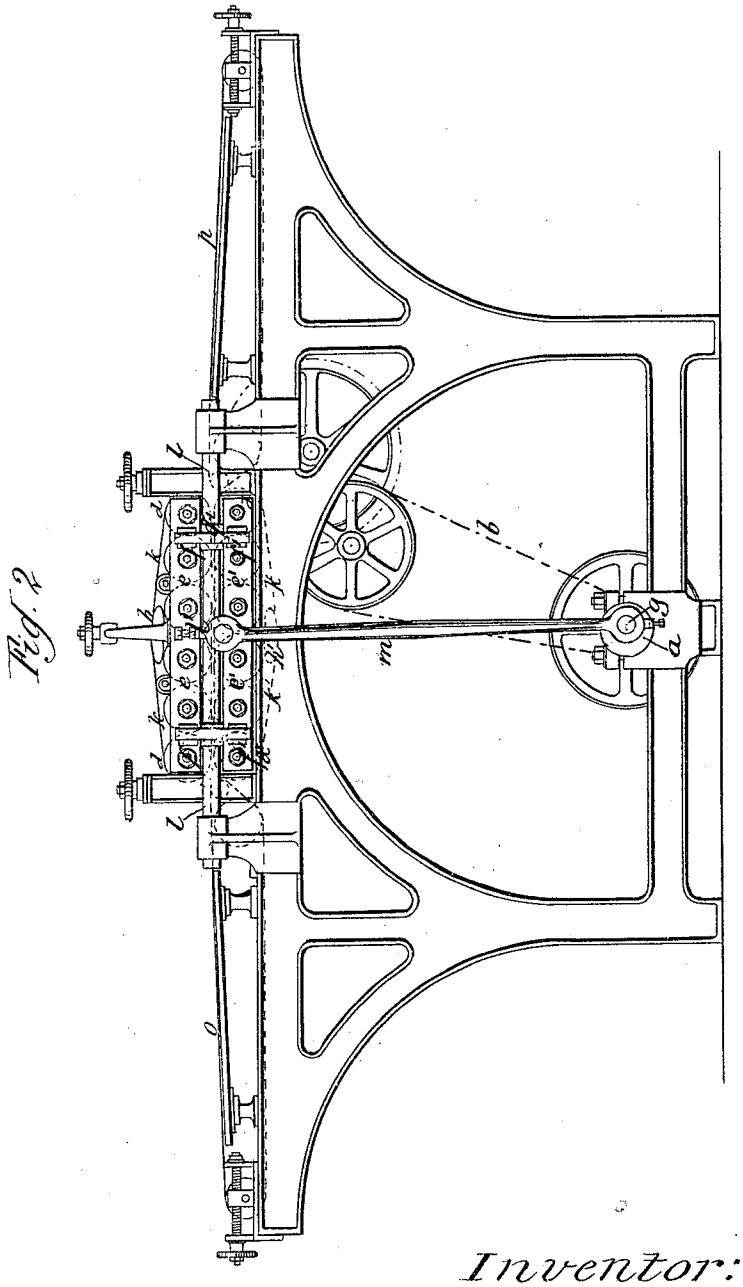


Fig. 2

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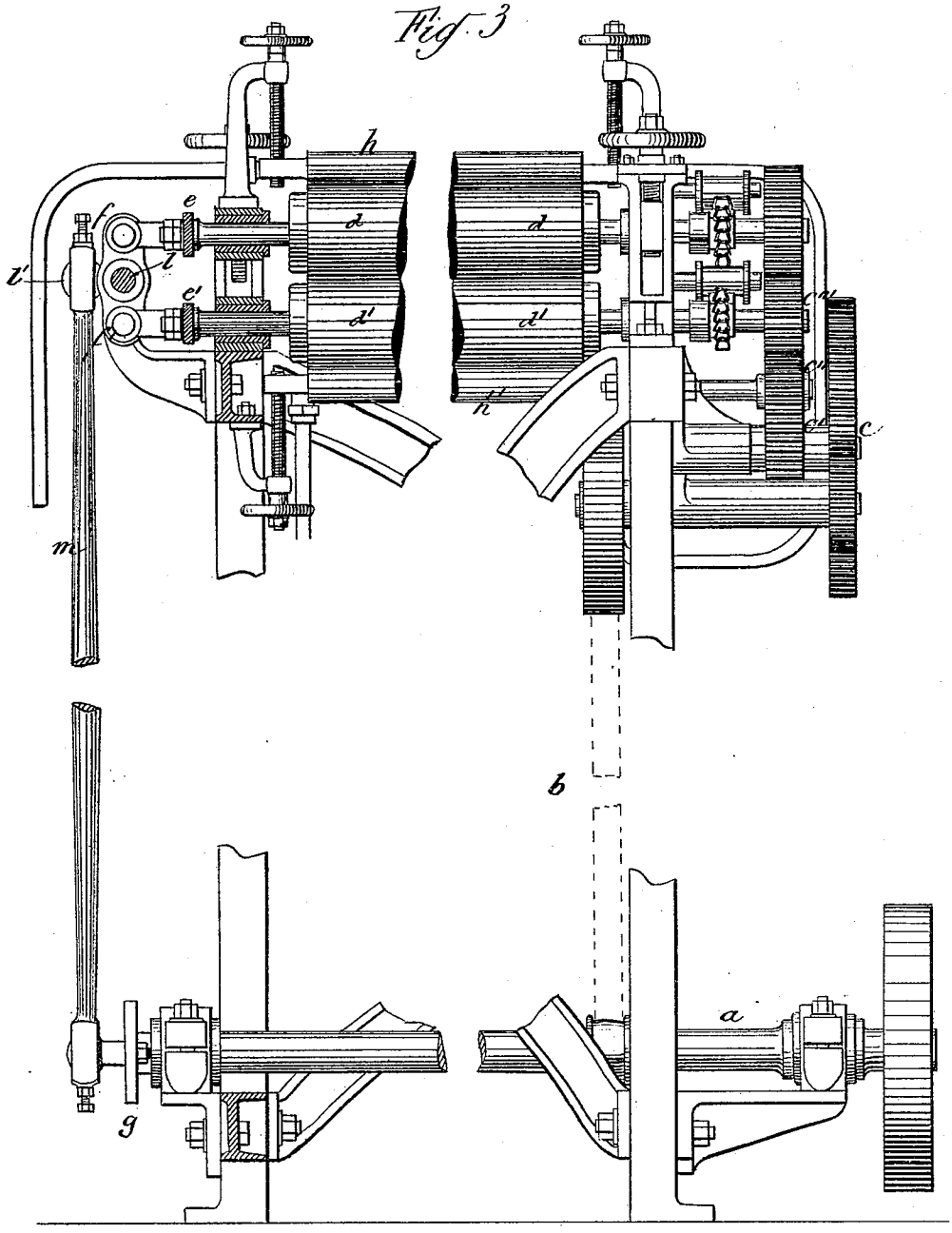
(No Model.) 4 Sheets—Sheet 3.

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FELTING MACHINE.

No. 248,660. Patented Oct. 25, 1881.

Fig. 3



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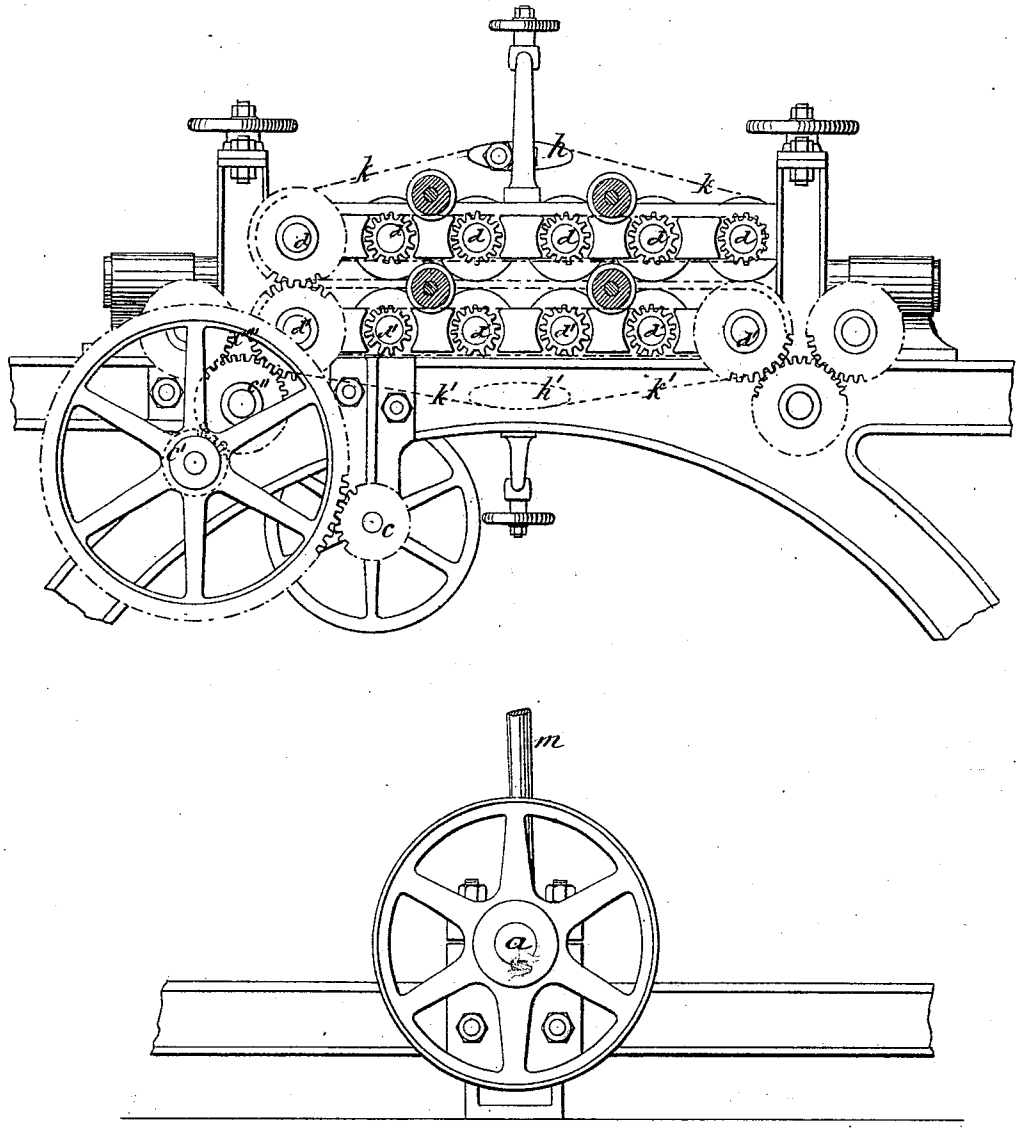
(No Model.) 4 Sheets—Sheet 4.

C. P. MARIN.

FELTING MACHINE.

No. 248,660. Patented Oct. 25, 1881.

Fig. 4.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

CORONET PONS MARIN, OF BARCELONA, SPAIN.

FELTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 248,660, dated October 25, 1881.

Application filed August 8, 1881. (No model.) Patented in France December 17, 1880.

To all whom it may concern:

Be it known that I, CORONET PONS MARIN, a citizen of the French Republic, residing in Barcelona, Spain, have invented certain Improvements in Felting-Machines for use in the Manufacture of Hats, Caps, and other Similar Articles, of which the following is a specification.

My machine is designed wholly or partially to take the place of the hand manipulation of hats and other articles during the process of felting.

In Figure 1 of the accompanying drawings my machine is shown in front elevation, and in Fig. 2 it is shown in side elevation. Fig. 3 is an enlarged fragmentary rear elevation, partly in vertical section, showing some portions of my machine in detail; and Fig. 4 is a side elevation thereof, partly in section.

At the feeding-end of my machine is an endless carrying-belt, *o*, Fig. 2, which carries the articles to be felted toward the center of the machine where the felting devices are arranged. These consist of two oppositely-arranged endless flannel aprons, *k* and *k'*, the former above and the latter below, combined with a number of cylinders, *d d* and *d' d'*. The cylinders *d d* are arranged all in the same horizontal plane and within the upper apron, *k*, this apron being strained over them, and also over a copper tube, *h*, arranged above them. The lower cylinders, *d' d'*, are arranged in like manner within the lower apron, *k'*, which passes around a tube, *h'*, below them. The tubes *h* and *h'* are heated by steam, so that the aprons *k k'*, as they pass around them, are kept at the desired temperature, and the tubes are also vertically adjustable by screws, Fig. 3, or otherwise, so that the aprons may be strained to the proper tension.

Under the bed of the machine may be seen the driving-shaft *a*, on which is fixed a sheave, which communicates by a belt, *b*, with a pulley, *b'*. This pulley communicates through a train of gearing, *c c' c'' c'''*, to the first of the cylinders *d* and *d'*, Fig. 4, and from these the remaining cylinders are driven from a chain engaging pinions at their ends, Fig. 3. The aprons *k k'* are thus carried slowly around, their portions adjacent to each other moving in a direction away from the feeding-apron *o* and toward a corresponding apron, *p*, at the opposite end of the machine, which travels in the same direction as the apron *o* and serves as a delivering-apron. The cylinders *d d'*, in addition to the rotary motion just described, are given a rapid reciprocating motion in the direction of their axes. The shaft *a* bears an eccentric or crank, *g*, which reciprocates a pitman, *m*, whose upper end engages (by a ball-and-socket or other joint) a laterally-projecting arm, *l'*, from a shaft, *l*, which is arranged longitudinally of the machine. As the shaft *a* rotates the shaft *l* is thus oscillated. The shaft *l* has arms *f f* projecting upwardly from it, and arms *f' f'* projecting downwardly from it. The arms *f f* connect by pitman with a bar, *e*, and the arms *f' f'* with another bar, *e'*. The upper cylinders *d d* all have their shafts terminate in the bar *e*, they being so connected therewith that all the cylinders will move longitudinally of their axes with the movement of the bar, and the cylinders *d' d'* are connected in like manner with the bar *e'*. As the shaft *l* oscillates the bars *e e'* reciprocate toward and from that shaft, their movement being alternate, and thus the cylinders *d d* and *d' d'* likewise reciprocate, the upper cylinders, *d d*, moving in one direction as the lower cylinders, *d' d'*, are moving in the opposite direction. The flannel-aprons *k* and *k'* are caused to reciprocate with the cylinders over which they pass, and thus the articles of felt to be operated upon are subjected, as they pass between the two aprons, to a uniform alternate rubbing motion, which is a close imitation of the manipulation given to the articles by the girls in hard felting; but, being much more uniform, the felting or entangling of the fibers will be likewise more uniform and thorough.

The operation is as follows: When the articles are ready for the action of the machine they are placed by a girl on the feeding-apron *o*, which carries them to the felting-cylinders and feeds them in between the two heated aprons *k* and *k'*. These aprons carry them slowly forward, and at the same time work them laterally in opposite directions, whereby the felting operation is accomplished. As the articles are delivered from the felting-aprons they are received by the apron *p*, which carries them to a second girl, who will pass them to

a third to be twilled, the operation being repeated until the felting is completed.

My machine is applicable to the felting of hats whether they be made on the block or on the bow, and by its use three girls are enabled to complete one thousand feltings of one hundred grains each. In practice I provide the machine with a reversing motion, so that either end may be made the feeding end of the machine.

Instead of laterally reciprocating both the felting-aprons, one may be held stationary and the other alone be reciprocated without essentially changing the operation of the machine.

I am well aware that felting-machines have been heretofore patented wherein two slowly-revolving aprons have been used, one of which is rapidly reciprocated relatively to the other; but in all such machines the reciprocation has been in a direction longitudinally of the aprons, and usually the end rollers bearing the aprons have been moved bodily in such direction at right angles to their axes and intermittently revolved to feed forward the articles under treatment. In my machine by giving the aprons a transverse reciprocation I am enabled by simple mechanism to feed the articles forward slowly and uniformly. The distinctive difference between the action of my machine and its predecessors is that in it the reciprocating felting motion is at right angles to the feed, while in them it is in the same direction as the feed.

I do not limit myself to the precise construction or materials herein described, as they may be varied in many ways without departing from the essential features of my invention, which I have defined in the following claims.

I claim as my invention—

1. A felting-machine consisting of two endless traveling aprons, between which the articles to be felted are carried, in combination with means for alternately reciprocating one or both aprons in a lateral direction, substantially as set forth.

2. A felting-machine consisting of two opposite and adjacent series of revolving cylinders, means for reciprocating the cylinders in the direction of their axes and those of one series in the opposite direction to those of the other, and two endless aprons of suitable fabric each passed around one of said series of cylinders, substantially as set forth.

3. The combination of cylinders *d d* and *d′ d′*, means for slowly revolving them, bars *e* and *e′*, shaft *l*, having arms *f f* and *f′ f′*, and means for oscillating said shaft, substantially as set forth.

4. The combination of cylinders *d d*, means for slowly revolving them, apron *k*, heating-tube *h*, and means for adjusting said tube toward or from said cylinders to regulate the tension of said apron, substantially as set forth.

5. The combination of aprons *k k′*, cylinders *d d d′ d′*, bars *e e′*, shaft *l*, arms *f f*, *f′ f′*, and *l′* thereon, pitman *m*, eccentric *g*, and shaft *a*, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CORONET PONS MARIN.

Witnesses:
ROBT. M. HOOPER,
DE ROUGEMONT.