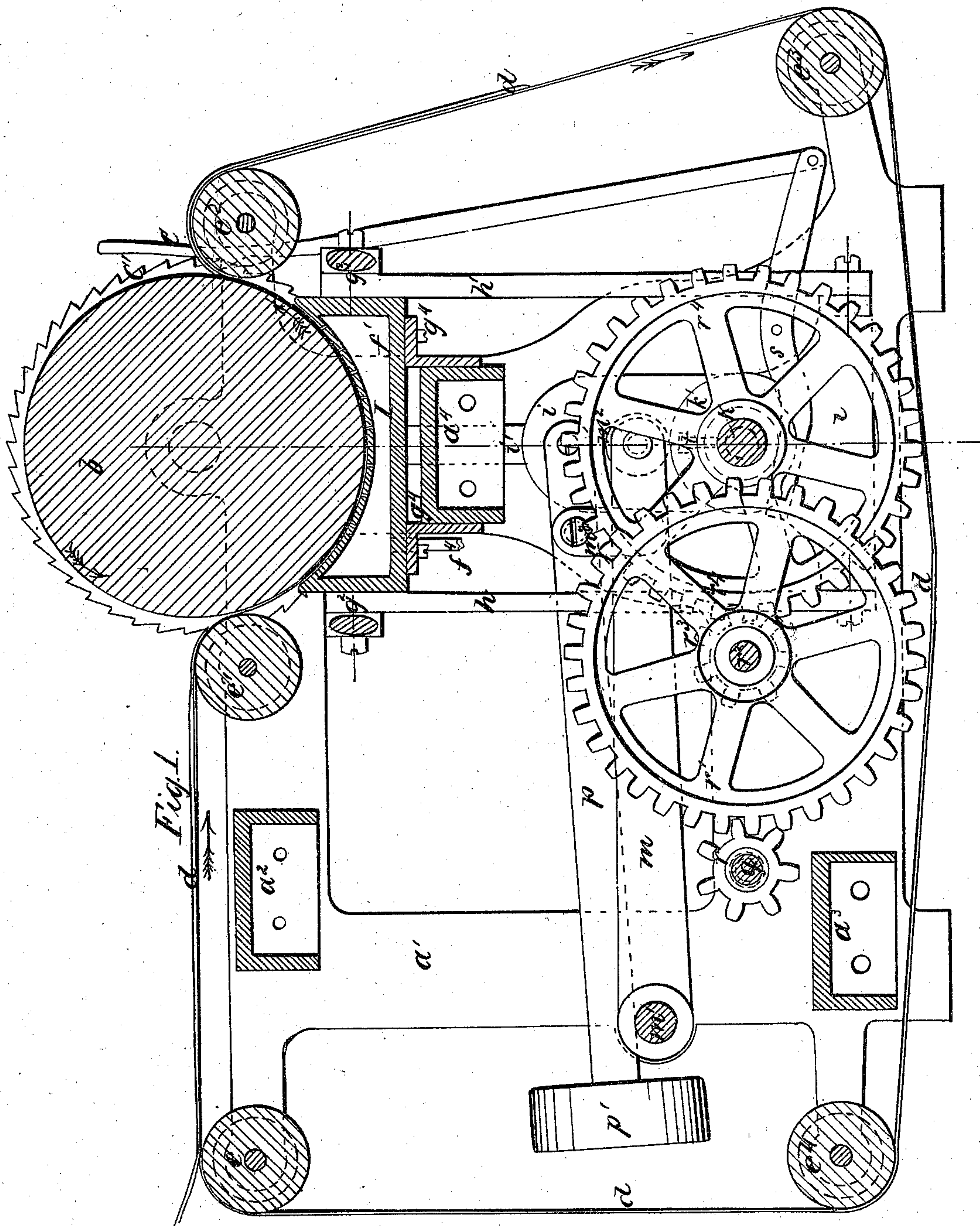


R. Eickemeyer. Sheet 1, 3 Sheets.

Felting Mach.

N^o 87,463.

Patented Mar. 16, 1869.



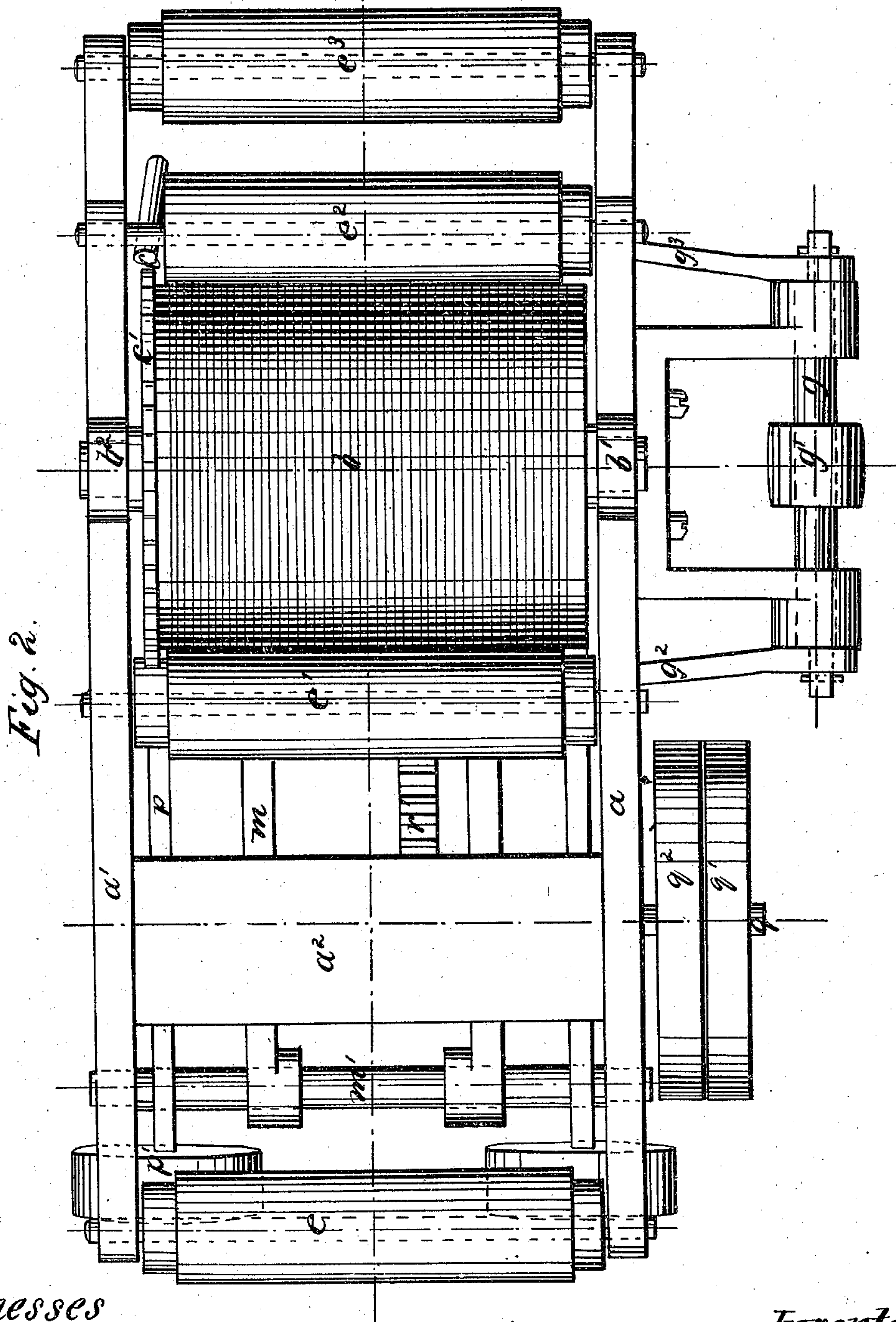
Witnesses
Gustav Kaster
Theodore Fitch.

Inventor
Rudolf Eickemeyer

R. Eickemeyer *Sheet 2, 3 Sheets*
Felting Mach.

Nº 87,763.

Patented Mar. 16, 1869.



Witnesses

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Theodore Pitch

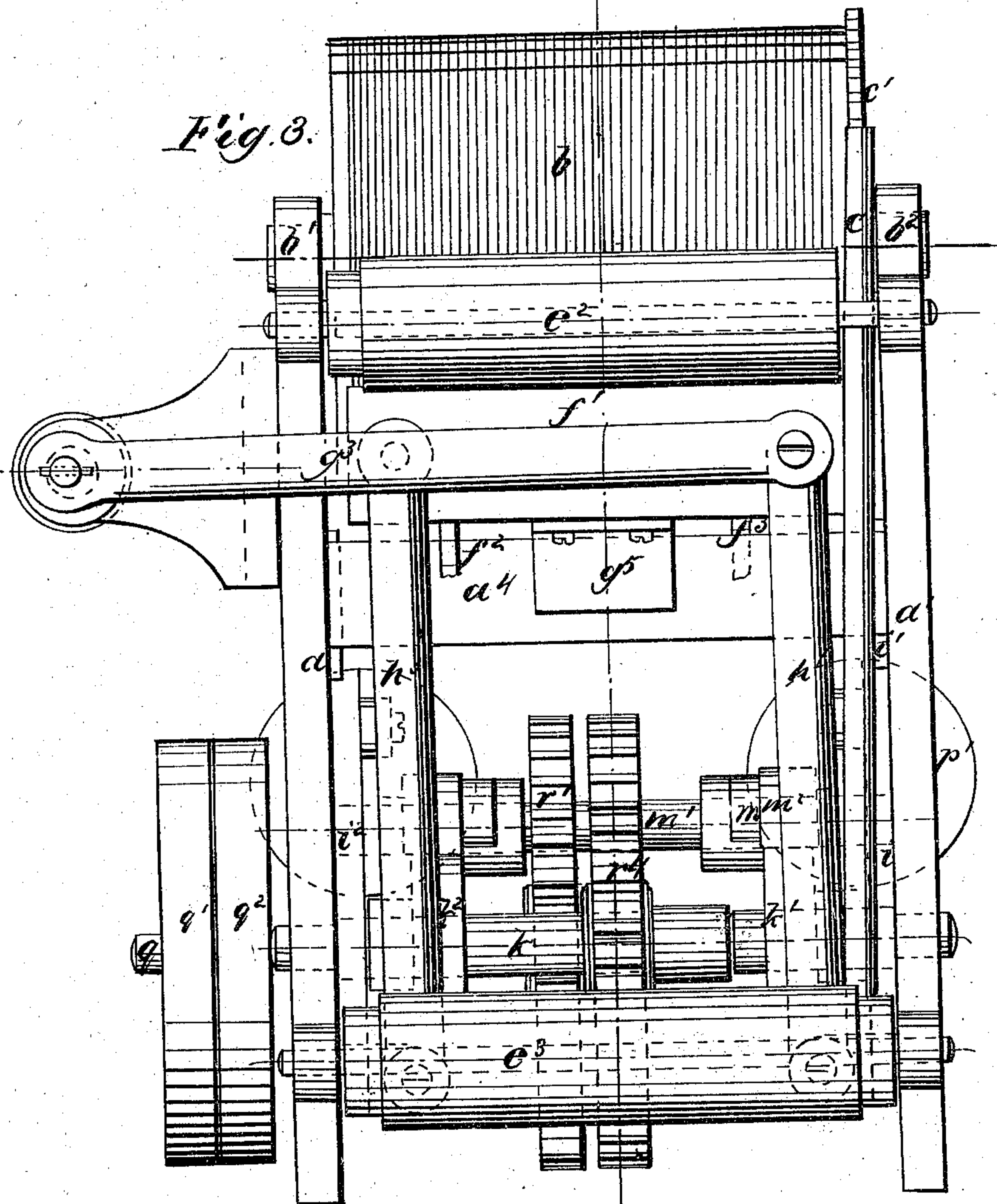
Inventor

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R. Eickemeyer Sheet 3, 3 Sheets.
Felting Mach.

N^o 87,763.

Patented Mar, 16, 1869.



Witnesses

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United States Patent Office.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK, ASSIGNOR TO
JOHN T. WARING, OF SAME PLACE.

Letters Patent No. 87,763, dated March 16 1869.

IMPROVEMENT IN FELTING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester, and State of New York, have invented certain new and useful Improvements in Machinery for Felting Felt Cloths; and I do hereby declare that the following is a full and correct description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon.

My said invention, which forms the subject of the present specification, consists in the arrangement and combination of an intermittently-moving horizontal felting-cylinder, with an endless hardening-cloth, and a horizontal concave jiggering-apparatus, substantially as hereinafter described.

In another specification, I have described a similar concave jiggering-apparatus, applied with a similar endless hardening-cloth to a cylindrical "tuft-holder," in a machine organized for felting tufted fabrics, but that machine, not being suitable for felting plain cloths, by reason of the cylinder being perforated with holes to receive tufts, I have in this invention combined the concave jiggering-apparatus and hardening-cloth with a plain cylinder, in order to make a simple and effective machine for felting plain cloths. The cylinder in this machine may, however, be engraved or embossed, so as to impress a figure in relief upon one side of the cloth while the felting is being carried on, if desired.

Figure 1, of the drawings, represents a vertical longitudinal section of my improved machine.

Figure 2, a plan view, and

Figure 3, an end elevation of the same.

The side frames a a^1 of the machine are framed together by the cross-braces a^2 a^3 a^4 .

The felting-cylinder b is mounted horizontally in fixed bearings b^1 b^2 , in the side frames, and is moved intermittently, in the direction indicated by the arrows, by a pawl, c , and ratchet-wheel c^1 , the latter attached to the shaft of the felting-cylinder.

The felting-cylinder may be of wood, but should preferably be made hollow, of iron, or other suitable metal, and have hollow shafts, by which steam can be introduced within, for the purpose of warming it, if desired, as in calender-rollers. The surface should be slightly scored or grooved circumferentially, to hold the fabric, while felting, against the action of the jigger.

The hardening-cloth d is an endless apron, or conductor, of linen, canvas, or other suitable material for a hardening-cloth, extended over the drums e e^1 e^2 e^3 e^4 , the two drums, e^1 and e^2 , being placed, one each side of the felting-cylinder, in such manner as to wrap the portion of the hardening-cloth between them around the lower half of the surface of the felting-cylinder, so that when the felting-cylinder is moved, the hardening-cloth moves with it, and conducts the prepared fabric to and from the felting-cylinder, holding it to the felting-cylinder while the jigger is in action.

The jiggering, or rubbing-plate, by which the felting is accomplished, is a concave metal plate, f , which forms the top plate of a steam-box, f^1 . This concave plate is of a curvature corresponding to that of the felting-cylinder, and is perforated with fine holes, to permit steam to pass to the fabric to be felted through the hardening-cloth.

The steam-box f^1 has suitable induction and education-pipes f^2 f^3 , (shown broken off,) which should be connected, by flexible connecting-pipes, with a source of supply of steam, and a waste-water receptacle.

This steam-box, with its concave rubbing-surface, is placed immediately under the felting-cylinder, and that portion of the hardening-cloth in contact therewith, and receives a very short and exceedingly rapid motion from the eccentric-shaft g , which may be driven, as usual, by a rapid belt from a separate counter-shaft overhead, running upon the driving-pulley g^1 , and is connected with the steam-box f^1 by two connecting-rods g^2 g^3 .

At each side of the jiggering steam-box are guides g^4 g^5 , which constrain it to vibrate in a direction transverse to the cylinder, but do not interfere with its being moved toward and from the felting-cylinder.

The steam-box and its concave jiggering-surface are moved up and down, and held against the hardening-cloth and felting-cylinder with a yielding-pressure, by mechanism, as follows, viz:

The steam-box is supported by four rocking columns, two of which, h h^1 , are connected by joints to lugs or projections from the lower part of a sliding plate, i , which slides up and down within the frame upon the side frame a^1 , the upper part of the sliding plate i having a guide-bar, i^1 , projecting upwards from it, which slides in a recess in the end of the cross-brace a^4 , the lower part of the sliding plate being guided by the cam-shaft, which passes through a slot made in the middle of the lower part of the plate for that purpose; and the other two columns, (one only, h^3 , shown in the drawings,) are similarly connected to an opposite sliding plate, i^2 , which slides up and down upon the opposite side frame in the same manner as the sliding plate i .

The two opposite sliding plates, i and i^2 , are exactly alike, facing each other on opposite sides of the machine, within the side frames, and are each independently moved up and down at the same time by means of cams k^1 k^2 , fast to the cam-shaft k , operating through two systems of weights and levers, one system for each sliding plate.

The two systems of weighted levers, being alike, a description of one only will be given—that which is in connection with the cam k^1 and the sliding plate i .

This system of levers consists of a lever, m , pivoted upon the cross-shaft m^1 , and extending horizontally to the cam k , being provided at the end with an anti-friction roller, m^2 , which runs on the cam k^1 .

The lever m is linked, by a short link, m^3 , to the fulcrum-point of a lever, p , immediately above it, which lever is connected to the sliding plate i at one end, and is loaded with weights p' at the other end. The arrangement and proportions of the levers being as shown in the drawings, the cam lifts the sliding plate and its end of the steam-box by lifting the weighted lever p . When the cam turns, to lower the sliding plate, the weighted lever p rests on the cross-shaft m , close by the weights, and relieves the sliding plate and steam-box from the upward pressure due to the weights, permitting the steam-box to be lowered sufficiently to allow the felting-cylinder to be moved.

The rotating cam-shaft k is driven by a train of cog-wheels from the driving-shaft q , upon which are the fast and loose pulleys q^1 q^2 , as follows, viz:

A pinion, r , fast to the driving-shaft q , gears into a spur-wheel, r^1 , fast to the intermediate rotating shaft r^2 , which also carries a pinion, r^3 , which gears into the spur-wheel r^4 , fast to the cam-shaft. The exact proportions of these wheels are not material, as they are merely used to reduce the speed and increase the power from the light driving-belt.

The pawl c , which moves the felting-cylinder, is actuated by the lever s , to which it is connected, the lever being moved the proper distance by a wiper in the form of a set-screw, t , screwed into the cam-shaft k .

The operation of the machine is as follows:

The prepared fabric, being fed upon the hardening-cloth continuously, is carried by it to the felting-cylinder, the latter having an intermittent progressive mo-

tion, and held to the surface of the cylinder. The cylinder being at rest, the vibrating concave jigger rises and presses against the under side of the hardening-cloth with a yielding pressure, being, at the same time, in rapid motion, and supplied with steam, affords the requisite motion, heat, moisture, and pressure to felt the fabric, or partially felt the fabric while in action, and the cylinder being moved the distance of only one tooth of the ratchet, or a very short distance at a time, the concave jigger repeats its action upon the greater part of the fabric it had previously acted upon, thus progressively felting the fabric as it passes through the machine.

The fabric adheres to the felting-cylinder and hardening-cloth sufficiently for the purpose of feeding, but, should it be desired, a ratchet-feed can readily be attached to one of the carrying-drums of the hardening-cloth, or either one or both of the drums next to the felting-cylinder may be geared with it by cog-wheels.

The concave rubbing-plate should be slightly grooved or scored in a direction opposite to that of its vibration, so as to take hold of the hardening-cloth.

I claim the combination and arrangement of the felting-cylinder, endless hardening-cloth, and vibrating concave jiggering-apparatus, constructed and operating substantially in the manner hereinbefore described.

RUDOLF EICKEMEYER.

Witnesses:

THEODORE FITCH,
GUSTAV KASTOR.