

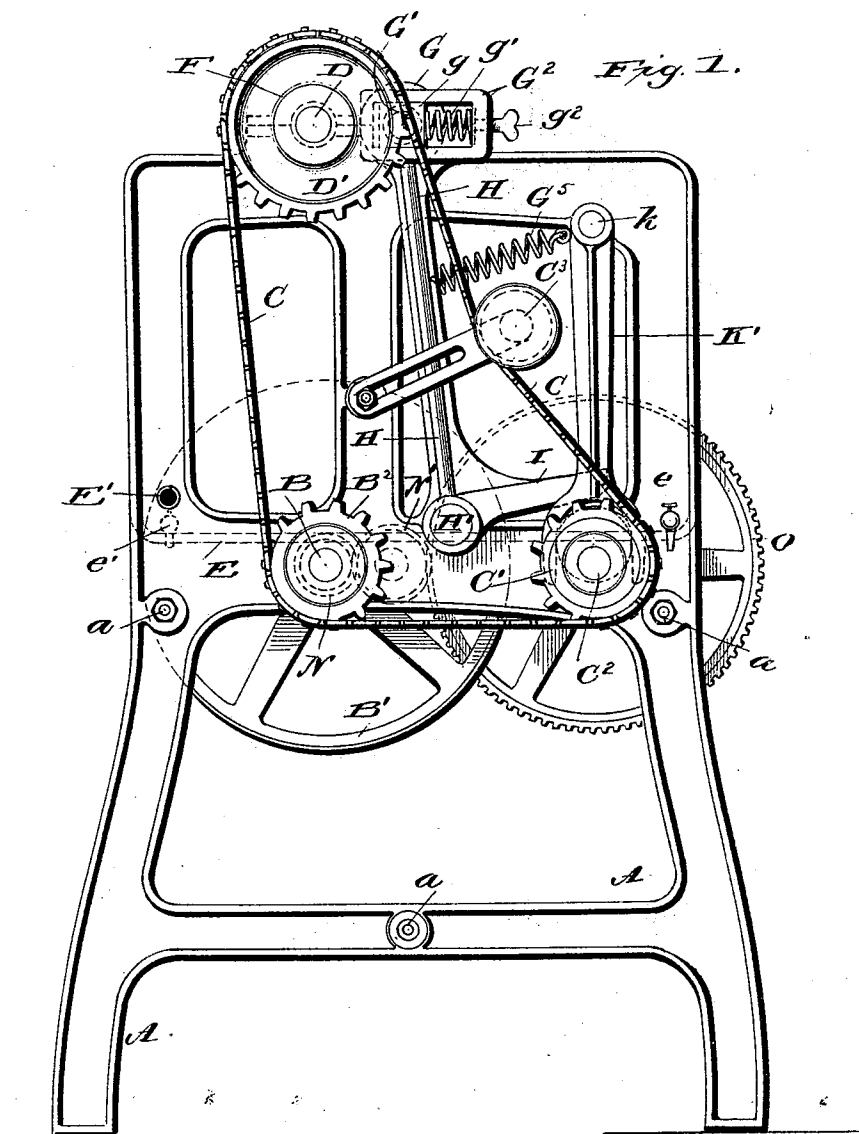
(No Model.)

3 Sheets—Sheet 1.

A. CONKLING.
STARCHING MACHINE.

No. 520,668.

Patented May 29, 1894.



Witnesses:
L. C. Mills
E. A. Bond

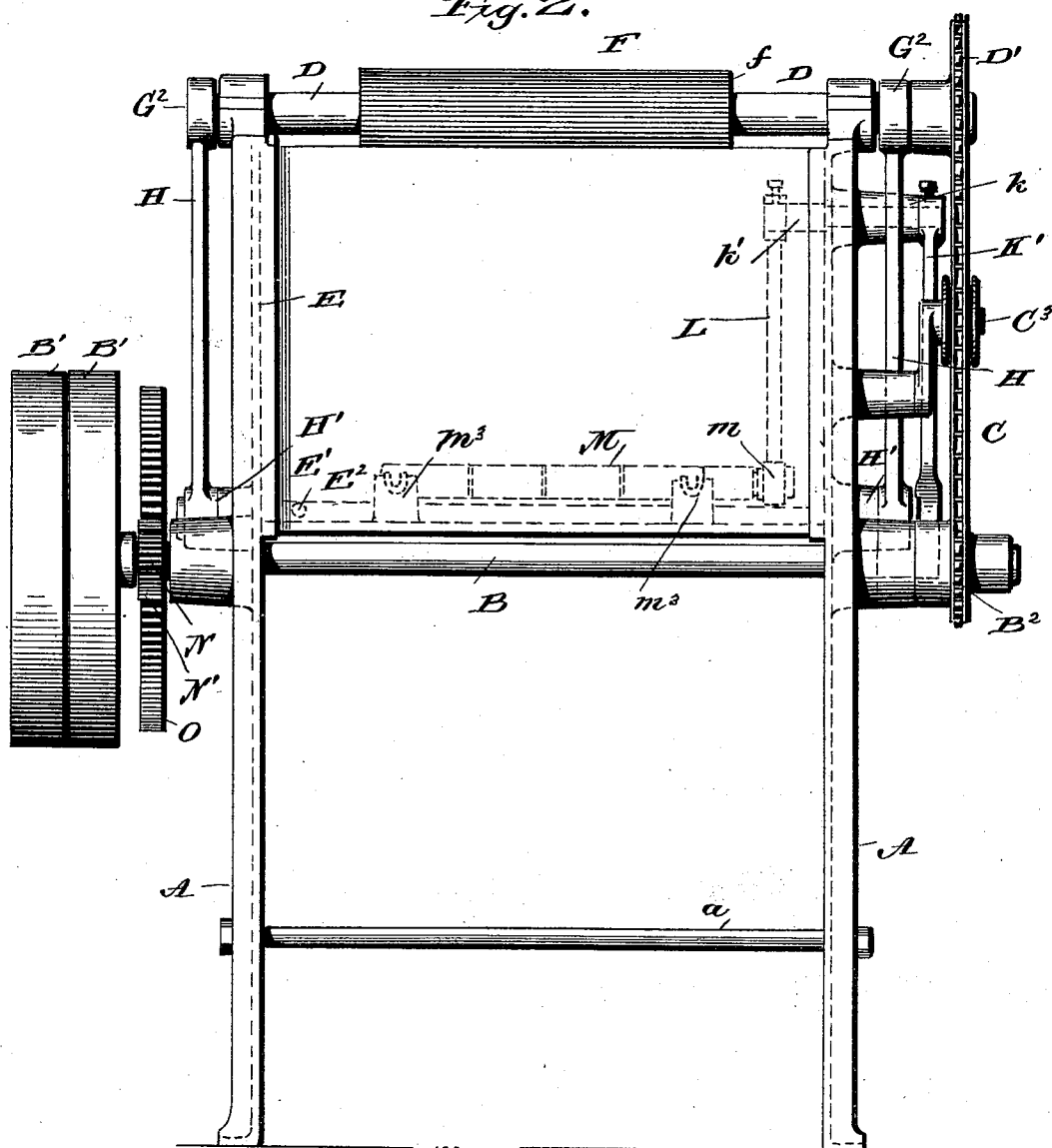
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3 Sheets—Sheet 2.

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Fig. 2.



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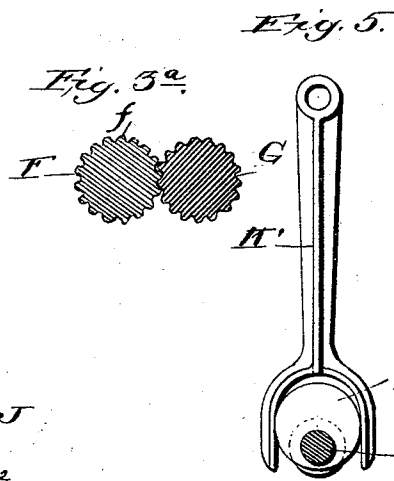
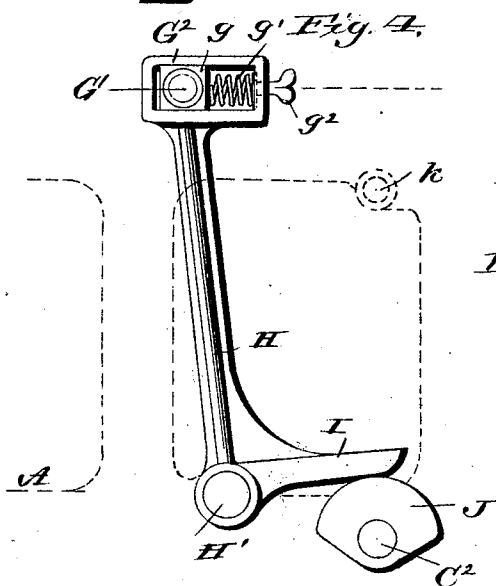
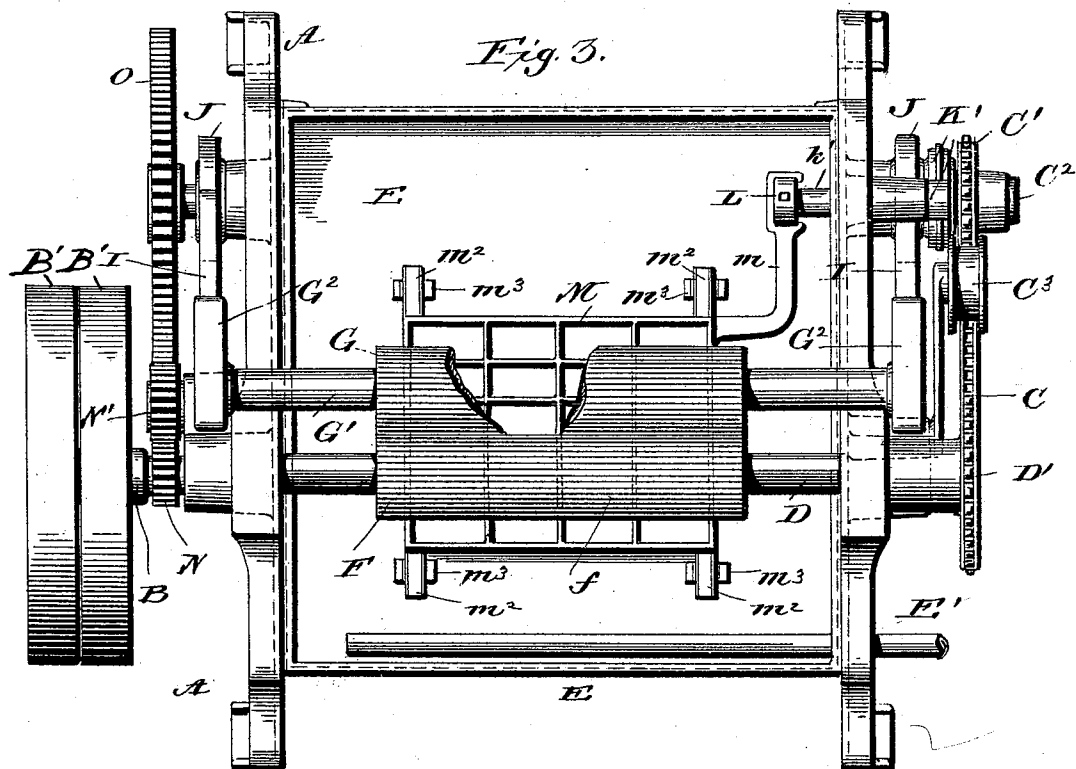
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A. CONKLING.
STARCHING MACHINE.

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Attorney

UNITED STATES PATENT OFFICE.

ALLEN CONKLING, OF CHICAGO, ILLINOIS.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 520,668, dated May 29, 1894.

Application filed October 19, 1893. Serial No. 488,561. (No model.)

To all whom it may concern:

Be it known that I, ALLEN CONKLING, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois,

5 have invented certain new and useful Improvements in Starching-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in starching machines in which the goods are placed between rollers and the starch forced through the goods and the surplus starch squeezed therefrom.

15 Heretofore this has usually been done through the medium of a foot treadle, but it has been found that by this method each article does not get the same amount of pressure and consequently not the same amount

20 of starch; besides some portions of the bosom of a shirt for instance will receive more starch than other portions, resulting in a very unsatisfactory finish as some parts will become soft.

25 One of the primary objects of this invention is to overcome these objections, which I do by working the rolls automatically, whereby the parts may be adjusted so that each shirt bosom shall have the same amount of

30 pressure and all parts of the bosom receive the same amount of starch which has been found to be essential to good results.

Another object of the invention is to prevent the caking or burning of the starch as well as its clinging to the sides or bottom of the starch receptacle. This I accomplish by the employment of an agitator in the starch receptacle, and, by suitable mechanism, actuate this agitator to prevent the starch from

35 becoming caked or baking on the walls of the receptacle and also insuring its being evenly cooked. This agitator-actuating mechanism acts in conjunction with the devices which operate the movable squeezing roll, and means

40 are provided for heating the starch. The rolls between which the goods are passed are preferably of a yielding nature and have longitudinal creases or ribs which serve effectually in squeezing the starch from the goods

45 as the latter are passed therebetween.

The features above outlined constitute the essence of the present invention, but at the

same time I aim at improvements in the details of construction as will appear as the description proceeds.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is an end elevation of my improved starching machine. Fig. 2 is a rear elevation of the same. Fig. 3 is a top plan with a portion of one of the squeezing rolls broken away. Fig. 3^a is a cross section through the starching rolls. Fig. 4 is a detail in elevation of the devices which actuate the movable roll. Fig. 5 is a detail of the cam and rock-arm for actuating the agitator.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the frame of the machine of suitable form and *a* are tie rods for the usual purposes of such devices.

In suitable boxes or bearings on this frame is journaled the horizontal shaft B provided with the band pulleys B' designed to be connected by a belt (not shown) with any suitable source of power whereby the operative parts may be driven. On one end of the shaft B is a sprocket wheel B² around which passes a sprocket chain C, which also passes over a sprocket wheel C' which is loosely mounted on a shaft C² parallel with the shaft B and on substantially the same horizontal plane, and over a sprocket wheel D' on a shaft D suitably journaled in the frame above the shafts B and C² as seen best in Fig. 1. A belt tightener C³ of any suitable form may be employed as shown in Fig. 1.

E is the box or receptacle within which the starch is to be contained; it is preferably though not necessarily of copper. The starch may be cooked or kept warm in any suitable way, as for instance by a steam pipe E' receiving steam from any suitable source passing into the box near the bottom thereof as shown in Fig. 3, or as indicated by dotted lines in Fig. 2 there may be a shallow pan E² which forms in reality a part of the box or

vessel and into this pan the steam pipe may empty as indicated in said Fig. 2. Suitable means as a cock or faucet *e* may be provided for drawing off the starch when necessary, and a similar device *e'* may be employed for drawing off the water of condensation from the pan or space beneath the bottom proper of the box or vessel, as seen in Fig. 1.

F is the relatively fixed roller; it is preferably of rubber or some yielding material and is also preferably creased or ribbed longitudinally as seen at *f* in Fig. 3^a; this roll is carried by the shaft D.

G is the co-operating roll; it is preferably similar in all respects to the roll F and the corrugations are arranged to intermesh more or less loosely as may be found most expedient, depending in a measure upon the character of the goods being operated upon. The goods, after being dipped in the starch in the box or vessel, are passed through between these rollers and the starch forced through the goods and the surplus starch squeezed therefrom. The shaft G' carrying the roller G is mounted in boxes or bearings *g* as shown more clearly in Fig. 4, which boxes are mounted to slide in the bearings G² which are carried at the upper ends of the rods or arms H, one at each side of the machine as seen best in Figs. 2 and 3, the lower ends of which are loosely sleeved upon stub shafts H', projecting from the frame as seen best in Fig. 2, and rigid therewith are the cam-arms I which rest upon the cams J fast on the shaft C², and arranged beneath the free ends of said cam-arms as shown best in Fig. 4. The boxes *g* are held under spring tension by the springs *g'* as shown in Figs. 1 and 4 and this tension may be regulated or adjusted by means of the set screws *g*². The roller G is held from its work by the springs G³ attached at one end to the arms or rods H and at their other end to the frame as shown in Fig. 1.

On the shaft C² is an eccentric K which is arranged to work within the fork or bifurcated end of the arm K' which is fulcrumed at its upper end on a boss *k* on the frame, a short shaft *k'* running through this boss as seen in Fig. 2 by dotted lines and Fig. 3 in full lines and connected with the upper end of a rod or arm L the lower end of which is connected with the lateral projection *m* extending from one corner of the agitator M which is mounted to reciprocate in a plane substantially parallel with the bottom of the starch receptacle, and in this instance is shown as in the form of a rectangular gridiron-like casting having at each corner a lug or projection *m*² arranged to slide in the guides *m*³ on the bottom of the box or vessel as shown clearly in Figs. 2 and 3. The form of agitator however is not essential neither is the manner of mounting it within the box or vessel.

On the shaft B is a small pinion N which meshes with a small pinion N' on a stub shaft extending from the frame and this latter pin-

ion meshes with the large pinion O on the shaft C³ to give proper direction to the rotation thereof.

With the parts constructed and arranged substantially as above set forth the operation is as follows: The starch is placed in the box or receptacle and heated and cooked by the steam (or it may be in any other convenient way), and the shirts or other articles are dipped in the starch and then passed through between the rolls F and G which squeeze the surplus starch therefrom. The cams and eccentric are so timed as to actuate the movable roll and the agitator at proper intervals, the rolls remaining in operative relation for a sufficient length of time to permit of the passage of the shirt between them and then they are separated. The movement of the agitator is back and forth, caused by the rocking or swinging of the arm K' first to one side and then to the other by the eccentric as will be understood from Fig. 5.

It will be observed that the operation or movements of the agitator and movable roll are automatic and that the amount of pressure on each shirt must be the same and each shirt bosom will receive a like amount of starch throughout its entire surface.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. In a starching machine, the combination with the rolls, one fixed and the other movable, of means for automatically actuating the movable roll as set forth.

2. In a starching machine, a movable starch-extracting roll, and an agitator operatively arranged for automatic, simultaneous and conjoint action, as set forth.

3. In a starching machine, the combination with a movable roll, of movable bearings in which the shaft thereof is mounted to move, arms carrying said bearings and provided with lateral portions, cams acting upon the under side of said portions, and means for actuating the cams, substantially as specified.

4. In a starching machine, the combination with a movable roll, of elongated bearings for the shaft thereof each having a yielding seat, arms mounted for oscillatory movement and carrying said bearings, and means acting upon lateral portions extending from said arms for oscillating the arms, as set forth.

5. In a starching machine, the combination with a fixed roll and a movable roll, of oscillating arms carrying supports for the shaft of said movable roll, cams for actuating the arms, and means for the automatic actuation of said cams, substantially as specified.

6. The combination with a starch box and the fixed and movable roll, of an agitator within the starch box independent of said rolls and mounted for reciprocatory movement, an oscillating arm connected therewith and an eccentric for operating said arm, as set forth.

7. The combination with the starch box and

an agitator therein independent of the starch-applying devices, of an oscillating arm connected with the agitator and having its lower end bifurcated, and an eccentric mounted to
5 work between the arms of the bifurcation, as set forth.

8. In a starching machine, the combination with a movable roll and an agitator mounted for reciprocatory movement, of automatic co-
10 operating devices for simultaneously actuating said roll and agitator, as set forth.

9. In a starching machine, the combination

with a movable roll and a reciprocatory agitator, of an oscillatory arm connected with the agitator, oscillating arms supporting the
15 shaft of the roll, and automatic mechanism for actuating said arms, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ALLEN CONKLING.

Witnesses:

H. H. HERR,
GEORGE CRAY ROBERTS.