

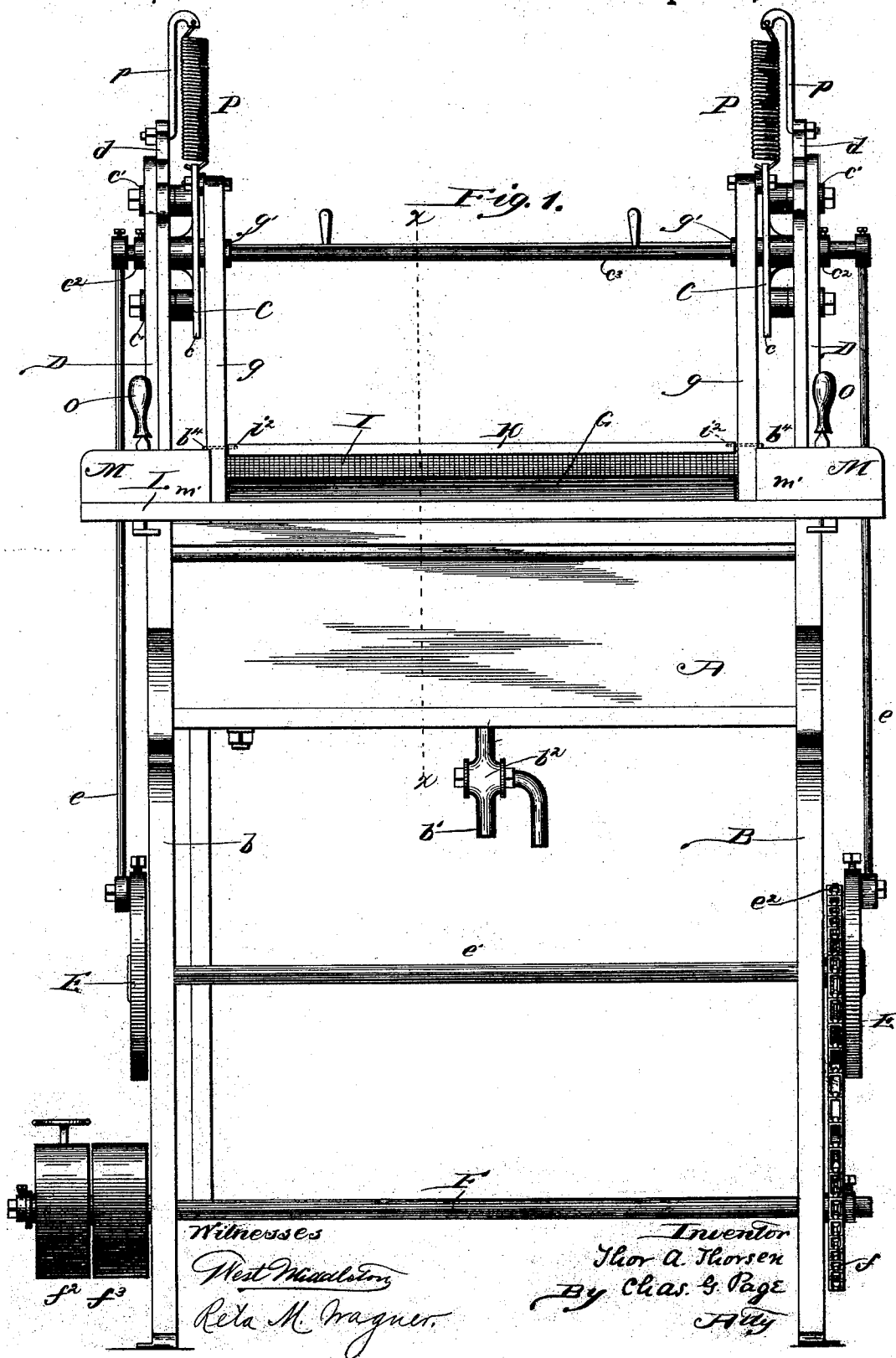
(No Model.)

3 Sheets—Sheet 1.

T. A. THORSEN.
STARCHING MACHINE.

No. 505,282.

Patented Sept. 19, 1893.



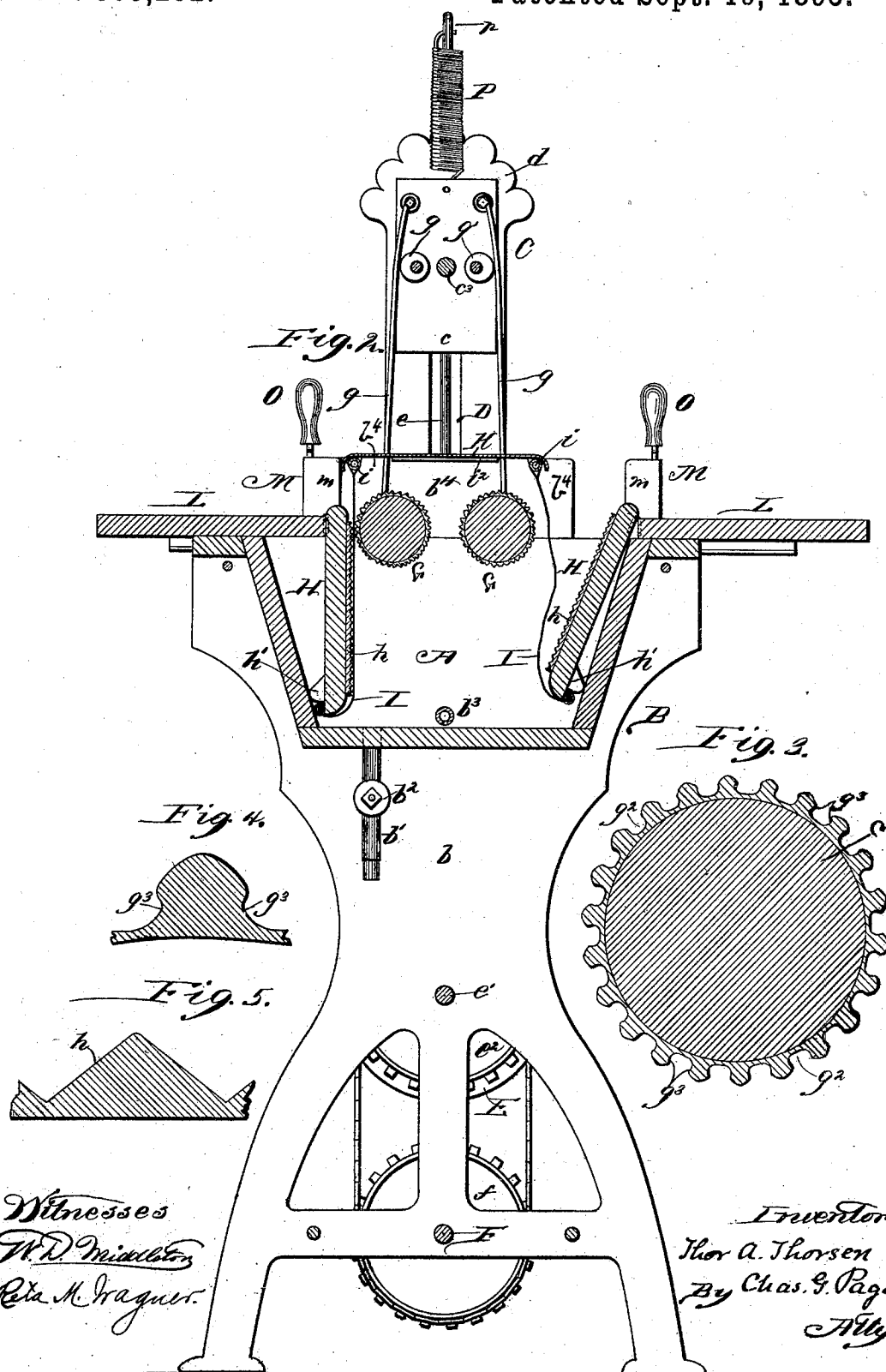
(No Model.)

3 Sheets—Sheet 2.

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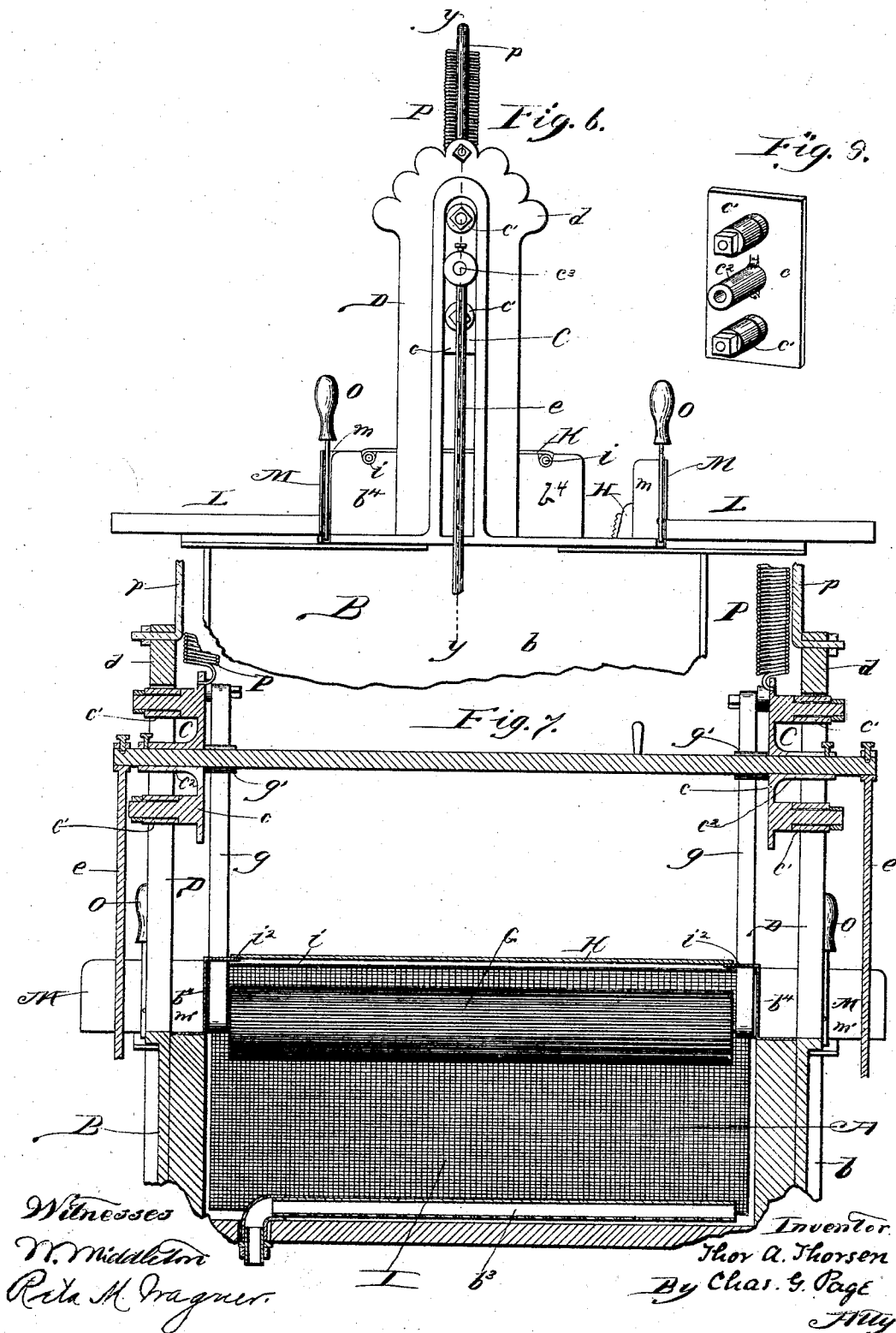
(No Model.)

3 Sheets—Sheet 3.

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STARCHING MACHINE.

No. 505,282.

Patented Sept. 19, 1893.



UNITED STATES PATENT OFFICE.

THOR A. THORSEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE S. H. SINCLAIR COMPANY, OF SAME PLACE.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 505,282, dated September 19, 1893.

Application filed July 25, 1892. Serial No. 441,123. (No model.)

To all whom it may concern:

Be it known that I, THOR A. THORSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Starching-Machines, of which the following is a specification.

In a starching machine embodying the principles of my invention I provide a bed or holder on which the article to be starched is placed, and a reciprocating starching roll, by which arrangement, the starching roll can at one end of its stroke, take a suitable quantity of starch from a suitable source of supply, and in then passing back over the article, distribute the starch along the same. In order to provide for a more uniform distribution of starch I arrange between the starching roll and bed, a flexible foraminous or open work sheet of textile or other suitable material, which said sheet is arranged to lie upon the article when the latter is in place upon the bed or holder. The starching roll is reciprocated so that it will traverse the sheet thus applied upon the article, and will while distributing the starch upon the sheet, force the starch through the same. By this arrangement I strain the starch, avoid its application to the article in a lumpy condition, and also regulate the quantity applied. The starching roll is held to its work with a yielding spring pressure so that it will conform to any irregularities in thickness in an article upon the bed and with a view of increasing the working capacity of the machine, I may duplicate the foregoing described matters, as hereinafter fully set forth.

I also provide certain details of construction and arrangement constituting matters of further improvement as hereinafter set forth.

In the accompanying drawings,—Figure 1 represents in elevation a starching machine embodying the principles of my invention. Fig. 2 is a vertical section through the same on line $x-x$ in Fig. 1. Fig. 3 shows one of the starching rolls in cross section on a larger scale. Fig. 4 shows on an exaggerated scale a transverse section through a portion of the starching roll face, and Fig. 5 is a like view of a portion of the face of one of the beds. Fig. 6 represents in elevation one of the up-

per side portions of the machine. Fig. 7 is a section on line $y-y$ in Fig. 6. Fig. 8 shows one of the end portions of the reciprocating starching roll carrier.

In said drawings, A indicates a trough or receptacle adapted for holding a suitable quantity of starch and supported by a main frame B comprising a couple of supporting sides or standards b arranged to position the starch receptacle at a convenient elevation. The starch receptacle is provided with a discharge pipe b' having a suitable cock b^2 , and as a means for keeping the starch at a proper temperature and consistency I arrange within the starch receptacle a perforated steam pipe b^3 which can be supplied from any convenient source of supply. Whenever found necessary, the steam-supply can be let on, and steam introduced into the mass of starch, so as to warm and moisten the same.

The machine illustrated is provided with a couple of reciprocating starching rolls so as to increase its working capacity, and to such end these rolls are attached to a reciprocating carrier C which may be operated by hand or other power, but which is more desirably operated by some suitable power driven mechanism so as to insure rapid and steady work. The ends c of the reciprocating carrier are guided by ways D arranged upon the main-frame of the machine, and as a simple, compact and convenient arrangement of driving mechanism, the carrier is reciprocated from crank-disks E by pitmen e , and the crank-disks are fixed upon a rotary shaft e' which is driven from a driving shaft F by chain and sprocket connection or other suitable gearing. In the illustration presented, these two shafts are respectively provided with sprockets e^2 and f , and the shaft F which is conveniently arranged at the base of the machine is provided with ordinary fast and loose belt pulleys f^2 and f^3 .

With reference to certain further details in the construction of the carrier, its ends c are provided with studs carrying sleeves or anti-friction rolls c' which traverse the guide-ways D so as to insure easy and steady work. Said ends of the carrier are also provided with bearings c^2 for a rod c^3 which connects said ends with one another and which pro-

vides upper journals for the pitmen. The starching rolls G are suspended from the carrier so that they may both dip into the starch when the carrier reaches the end of its down stroke, and in rising with the carrier, and after leaving the main supply of starch within the bottom portion of the starch receptacle apply the starch to such articles as may be placed upon beds H, arranged within the trough or receptacle A. As a matter of course the starching rolls could be operated to starch such articles if the beds H were arranged somewhat higher than shown but this would involve a longer stroke on the part of the carrier so as to permit the rolls to dip into the starch, and a consequent loss of time, and hence, to render the device more simple, compact and rapid in operation, the beds H are arranged within and at opposite sides of the starch receptacle, whereby as soon as the rolls rise from the starch, they can begin the work of applying the same to the articles on the beds.

In order to maintain the rolls against the articles with yielding pressure, I suspend the rolls from the carrier by springs or spring arms *g* and provide the carrier with cams or eccentrics *g'* arranged to engage the springs and adapted for rotary adjustment so as to vary the degree of force with which the springs will hold the starching rolls up to their allotted work.

The sheets I of open work fabric or analogous flexible foraminous material are at their lower ends attached to the lower end portions of the beds H, and at their upper ends attached to rods *i* arranged over the starch receptacle and disposed parallel with the starching rolls. These rods *i* are removably supported upon walls or guard plates *b'* which rise at the ends of the starching trough or receptacle. The rods also constitute supports for a cover K which may also rest upon ledges *i'* on said guard-plates.

The beds H are at their upper portions hinged to slides or sliding tables L upon which the articles to be starched can be laid preparatory to placing them upon the beds. The beds are brought into co-operative relationship with the rolls by adjusting the slides or tables toward the rolls, as in Fig. 2 wherein one table is shown adjusted in position to cause its allotted bed to hang in proper relationship to one of the starching rolls. In said figure, the remaining table is shown adjusted in position to draw its allotted bed away from the roll next adjacent thereto, and to also so separate the bed from its allotted strainers sheet I as to permit an article on the bed to be removed and another article to be placed thereon.

The sliding tables are provided with angular wall sections or guard plates M having portions *m* which meet the wall portions *b'* when the tables are moved toward the rolls, it being observed that the remaining portions *m'* of said guard plates stand at right angles to said portions *m*, as will be understood by reference to Fig. 1. The tables are also

provided with latches or locking levers O by means of which they can be temporarily locked after being properly adjusted.

The carriers are desirably subject to balance springs P suspended from supports *p* on the guide-way standards *d* and at their lower ends attached to the ends of the carrier.

The faces of the starching rolls and beds are ribbed or corrugated and as a matter of further improvement I so corrugate the roll faces as to provide channels *g'* having concaved side walls as best shown at *g'* Fig. 4, by which arrangement I provide the rolls with pockets for receiving and holding the starch in larger quantities, and parting with the same more gradually than could be attained by an ordinary groove or channel.

The ribs *h* of the bed-faces may be of any desired form, although I prefer making them V-shaped or serrated as best shown in Fig. 5.

The rear sides of the beds are provided with bumpers *h'* which rest against the sides of the starch receptacle and permit the beds to be readily drawn up when the slides or tables L are drawn back.

The slides and beds can when desired be readily removed from the machine, and in such case the rods *i* can be removed from the guards *b'* which support them.

With further reference to the flexible sheet I, it will be observed that it also constitutes an apron for holding the article to be starched upon the starching board H when the latter is in proper position relative to the roll. Said sheet may be of any suitable foraminous or open work material, and broadly considered as an apron for holding down the work under treatment, it will be noted that its openings serve as passages for passing the starch to the article, regardless of the size of mesh or openings; also that independently of its function as an apron for holding down the work, the sheet may be employed as a strainer, but that as a preferred arrangement, it serves both as a strainer, and as an apron for holding down the work.

What I claim as my invention is—

1. A starching machine comprising a starch receptacle, a bed or support which holds the article that is to be starched removed from the supply of starch within the starch receptacle and a reciprocating starching roll operating to take up a supply of starch from the receptacle, and to apply the same to the article upon the bed or support, in alternation, substantially as described.

2. A starching machine comprising a starch receptacle, a bed or support which holds the article that is to be starched removed from the supply of starch within the starch-receptacle a flexible foraminous or open work sheet arranged to cover said article, and a reciprocating starching roll operating to take a supply of starch from the receptacle and to traverse the said flexible foraminous or open work sheet in alternation so as to first take a suitable quantity of starch from the main source

of supply and then apply the same to the article by distributing it over and forcing it through the said sheet substantially as described.

5 3. A starching machine comprising a starch receptacle, a bed or support arranged to rise within the starch receptacle to an extent to support the article that is to be starched removed from a supply of starch occupying the
10 bottom portion of the receptacle, and a reciprocating starching roll having an up and down movement and operating to dip within the starch and to traverse an article upon the bed or support, in alternation so as to first
15 take up a suitable quantity of starch from the main supply and then distribute the same over the article, substantially as described.

4. The combination in a starching machine of a reciprocating starching roll operating to
20 take a supply of starch from a main source of supply and to distribute the same upon the article requiring starching, in alternation, and a bed H for said article arranged for adjustment in and out of co-operative relationship
25 with the starching roll, substantially as described.

5. In a starching machine provided with a reciprocating starching roll and stationary starching trough, a bed H adjustable into
30 and out of co-operative relationship with the starching roll, and a movable table L adjustable with reference to the adjustment of the bed, substantially as set forth.

6. In a starching machine a bed whereon
35 the article to be starched is placed, a reciprocating carrier, and a starching roll suspended therefrom and maintained in co-operative relationship with the bed by spring action, substantially as set forth.

7. In a starching machine, the combination
40 of a bed H, a suspended foraminous or open work sheet I attached to the lower portion of the bed, and a reciprocating starching roll arranged to distribute starch upon and force it
45 through said sheet upon an article placed between the sheet and bed substantially as set forth.

8. The combination in a starching machine of a bed whereon the article to be starched is
50 placed, a reciprocating carrier, and a starching roll attached to the reciprocating carrier by spring arms, substantially as set forth.

9. The combination in a starching machine of a starching roll, spring arms supporting
55 the starching roll and cams or eccentrics g'

for adjusting the spring arms, substantially as set forth.

10. In a starching machine, the starching receptacle, a couple of starching rolls suspended from a reciprocating carrier and arranged to dip into the starch receptacle, and
50 beds for the purpose set forth arranged within and at opposite sides of the starching receptacle, substantially as described.

11. In a starching machine, a reciprocating
65 starching roll, a bed, a foraminous or perforated sheet I attached at one end to an end of the bed, and a rod i' to which the opposite end of said sheet is attached, substantially as set forth.

12. In a starching machine, a sliding table
70 L, and a bed H hinged to the sliding table and arranged to hang therefrom within the starch receptacle in co-operative relationship with the reciprocating starching roll, substantially as set forth.

13. A starching machine comprising the starch receptacle, reciprocating starching
rolls G suspended from a reciprocating carrier, beds H arranged to rise within the starch
80 receptacle, and slides connected with the beds for the purpose of raising and lowering the same, substantially as set forth.

14. The combination in a starching machine of the reciprocating carrier C, provided with
85 one or more starching rolls, balance springs P suspending the carrier, and a driving mechanism by which the carrier is reciprocated, substantially as set forth.

15. In a starching machine, a bed whereon
90 the article to be starched is placed, a starch receptacle, a reciprocating starching roll arranged to dip into the starch receptacle, and a perforated steam pipe arranged within the starch receptacle whereby the starch can be
95 kept in proper condition, substantially as described.

16. In a starching machine, the starch receptacle A, end guards b⁴ and sliding tables provided with guards M, substantially as de-
100 scribed.

17. In a starching machine, the starching roll having a corrugated face with concaved sides for the channels, so as to form starch-
105 holding pockets, substantially as described.

THOR A. THORSEN.

Witnesses:

CHAS. G. PAGE,

W. D. MIDDLETON.