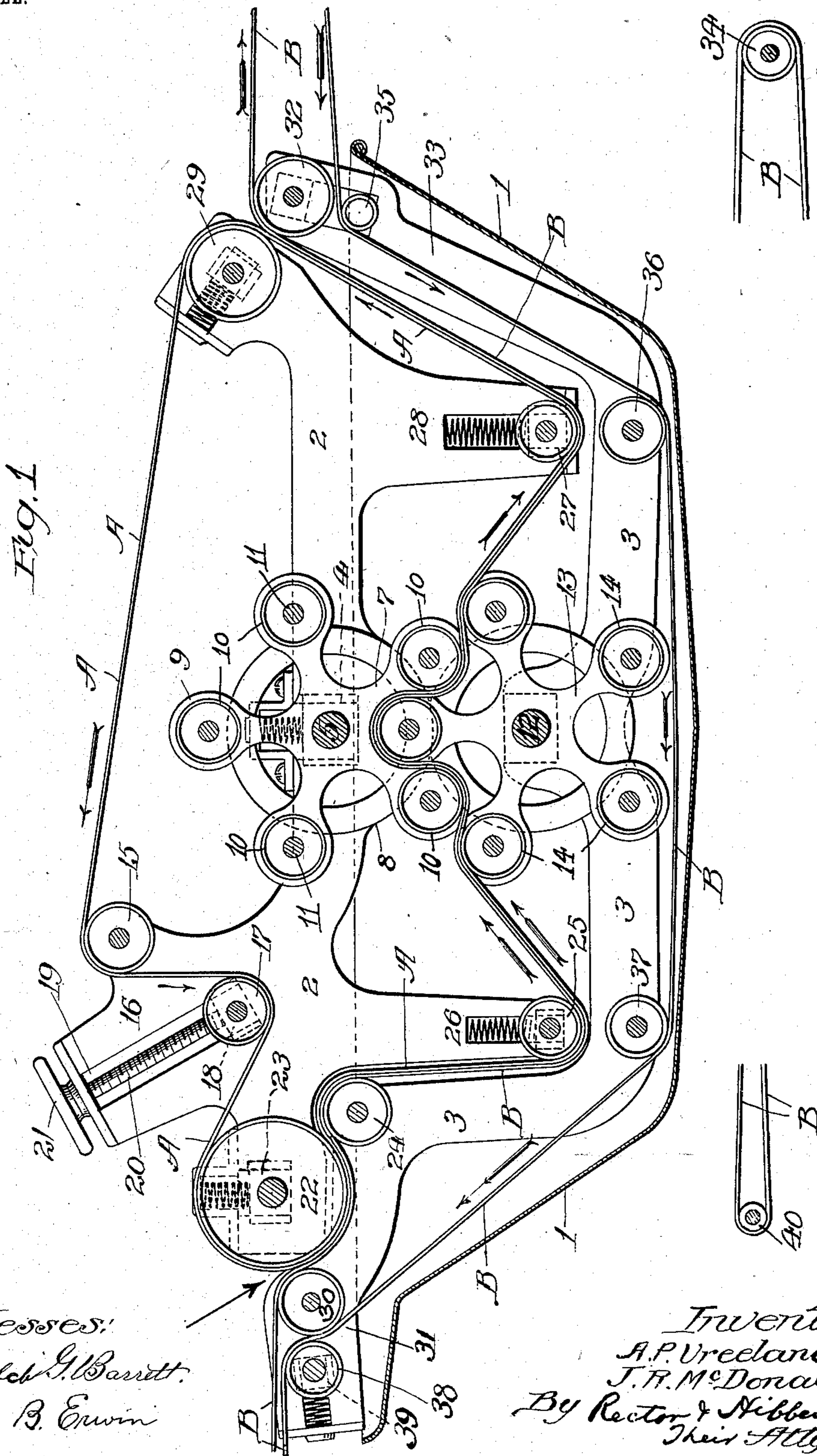


A. P. VREELAND & J. R. McDONALD.
STARCHING OR DAMPENING MACHINE.

APPLICATION FILED APR. 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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By Rector & Nibben
Their Attys.

No. 719,912.

PATENTED FEB. 3, 1903.

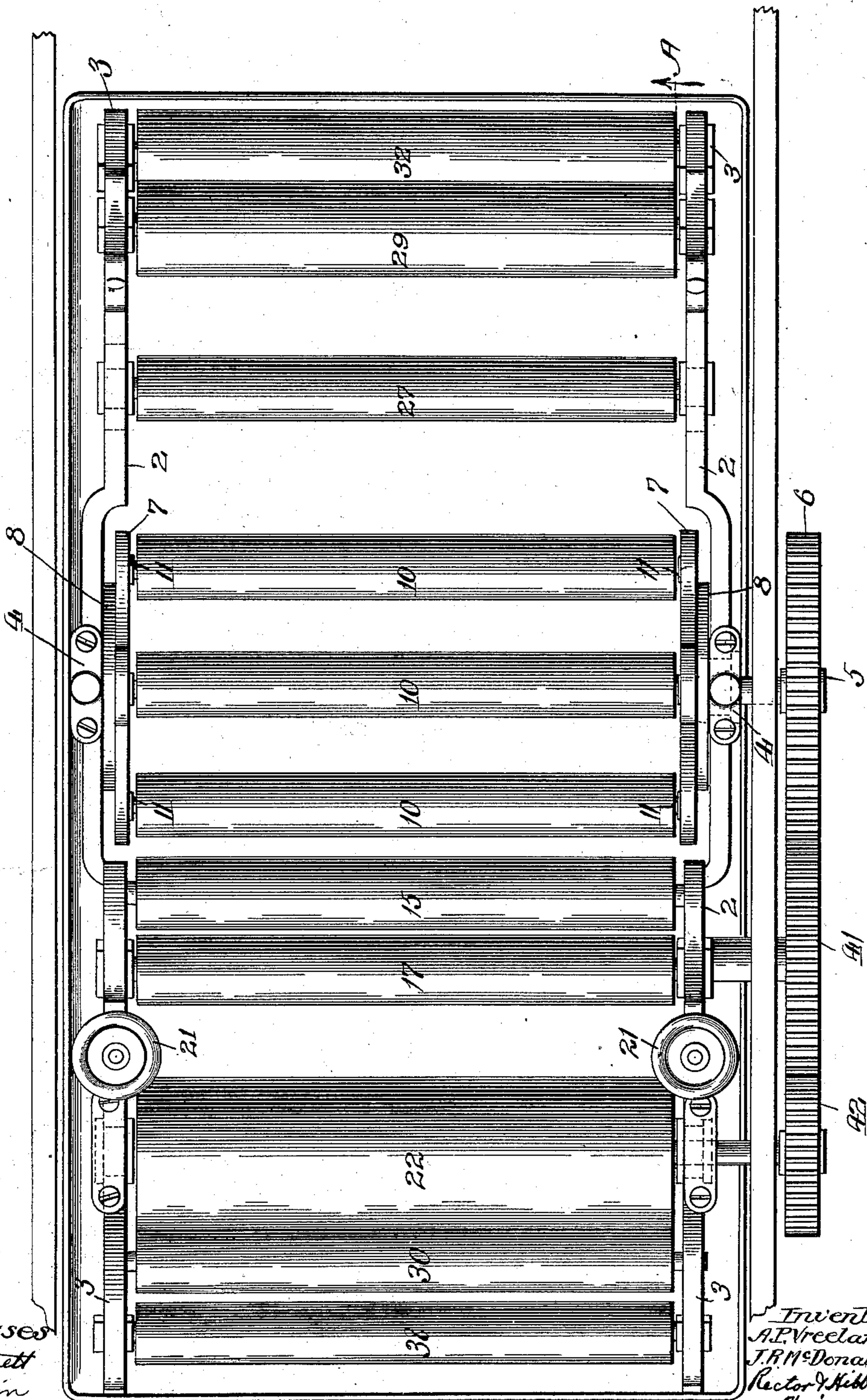
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Fig. 2



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UNITED STATES PATENT OFFICE.

ALEXANDER P. VREELAND AND JOHN R. McDONALD, OF CHICAGO, ILLINOIS,
ASSIGNORS TO R. BRUCE WATSON, OF CHICAGO, ILLINOIS.

STARCHING OR DAMPENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 719,912, dated February 3, 1903.

Application filed April 5, 1902. Serial No. 101,487. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER P. VREELAND and JOHN R. McDONALD, residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Starching or Dampening Machines, of which the following is a specification.

Our invention pertains to laundry machinery, more particularly to dampening and starching machines, but has more especial reference to and is herein shown in connection with machines for starching collars and cuffs and the like; and the object thereof is to provide a simple, efficient, and reliable machine of this character and one capable when embodied in a starching-machine of automatically starching collars and cuffs in the same manner and with the same beneficial results as in hand-starching, which has heretofore been recognized as the best. Our machine is therefore designed to perform substantially the same movements as in hand-starching, at least to attain the same results, with the further obtained advantage of permitting the use of cold thick starch instead of thin hot starch. However, as above suggested, our invention may be embodied in a dampening-machine, the starch-tank becoming, in such case a water-tank.

The above-outlined features of advantage, as well as others, will be apparent from the description of the construction and operation of our machine, as hereinafter set forth.

In the drawings, Figure 1 is a sectional elevation on the line A of Fig. 2; and Fig. 2, a plan of our machine, the small figures below Fig. 1 constituting a part of Fig. 1 and representing the end portions of the aprons at opposite ends of the machine.

The machine herein illustrated is a starching-machine comprising a starch-tank 1, of suitable size and proportions, within which are arranged, as usual, two cradles or frames, which are so made as to accommodate the various shafts, rollers, and bearings about to be described. The upper and lower cradles 2 and 3 are each composed of two similar oppositely-arranged frames or plates located when in place within and at each side of the tank. These cradles are removable, and, in fact, the entire starching-machine proper is

removable from the starch-tank within which these cradles loosely rest.

On the upper cradle 2 are mounted bearings 4, in which is journaled a transverse driving-shaft 5, extending beyond the line of the tank, where it is provided with a drive-gear 6, Fig. 2. Upon this shaft and at either side of the tank are secured end heads or plates 7 7, which preferably have cast thereon the ring 8 for strengthening purposes and which form the heads of what we term a "saturating-roll." These heads are spider-shaped by reason of the radially-projecting portions 9, whose ends are rounded to form what may be considered as rounded gear-teeth, with a deep rounded cavity or space between them, and adapted to receive similar rounded teeth, as hereinafter made apparent. Between corresponding ones of these projecting portions or rounded teeth of the opposite heads are arranged rods or tubes 10, which may or may not be rotatable independently of the heads. However, rotatability thereof is preferable, in which case there may be employed hollow tubes whose ends are closed and provided with short shafts 11, pivoted in holes in the rounded teeth of the heads.

The above-described construction constitutes the upper saturating gear-roll, which coöperates with the similar lower saturating gear-roll made and arranged as follows: At a point below the shaft 5 the cradle 3 has bearings for a similar transverse driven shaft 12, on which are secured the two end heads or plates 13 13, similar to the heads 7 on the shaft 5. These heads 13 have a series of transverse rods or bars 14, also preferably rotatable in their heads.

Both of the saturating devices above described may be for convenience designated as "gear-rolls," inasmuch as they intermesh, as shown in Fig. 1, both as to the heads and as to the transverse rollers or tubes. By preference and as herein shown the lower saturating-roll is driven by the upper roll; but while this is desirable it is not absolutely essential, so long as such rolls are driven in unison. Although we have shown end heads with provision for five transverse rollers, yet it is obvious that the number thereof may be varied as desired or as found expedient.

The goods or articles to be starched—as

for instance, collars and stuffs—are carried through the machine by means of a pair of endless belts or aprons, a suitable arrangement of which is shown in Fig. 1. Beginning with the upper apron A at the very top of the machine and referring to Fig. 1, this apron runs to the left in the direction of the arrow and around a roller 15, extending transversely of the cradle 2 and journaled in upright extensions 16 thereof. The apron A is then deflected vertically downward and under a roller 17, which is journaled in boxes 18, sliding in slots 19 in said extensions 16. The raising or lowering of the boxes by means of the screw 20, worked by the hand-wheel 21, causes a loosening or a tightening of the apron, whereby the apron may be adjusted and may be run tight or loose, as desired by the operator. The apron then passes around the large feed-roller 22, journaled in downwardly spring pressed boxes 23, arranged in the cradle 2, so as to be capable of yielding to some extent to the collars and cuffs fed into the machine, as hereinafter described. The apron then passes over a deflecting-roller 24, journaled in the cradle 3, and then passes vertically downward around the tension or take-up roller 25, downwardly spring pressed and journaled in the lower end of the depending extensions 26 of the cradle 2. The apron then passes between the intermeshing saturating gear-rolls and under a tension device or take-up roller 27, downwardly spring-pressed and journaled in depending extensions or arms 28 of the cradle 2. The purpose of these rollers 25 and 27 is to take up all slack in both aprons, and thereby keep them taut, but yielding. The apron finally passes over the roller 29, which is also journaled in the spring-pressed and sliding boxes, as shown in Fig. 1, for a purpose hereinafter described. This completes the circuit of the upper apron and brings us back to the point of starting. Now starting with the lower apron B at the extreme left-hand end of the machine this apron passes over the small stationary feed-roller 30, journaled in the extensions 31 of the cradle 3, and then passes between it and the large feed-roller 22, then, in company with the apron A, over the rollers 24 and 25, through the intermeshing saturating gear-rolls, under the take-up roller 27, and over the roller 32, where it parts company with the apron A. This roller 32 is journaled in upwardly-extending extensions 33 of the cradle 3. In traversing the tank from left to right between the rollers 30 and 32—that is, between the feed and delivery points of the machine—the two aprons travel together, one on top of the other, with the collars or cuffs held between them and fed and conveyed along therewith. After leaving the roller 32 the apron B then proceeds along horizontally, or substantially so, beyond the right-hand end of the starch-tank, so as to form a delivery-table in the same manner as the other end of the apron B to the left of the tank forms a feed-table. The apron B then extends around

a small roller 34, which may be so mounted in suitable manner as to tighten or adjust its apron. This apron then returns to the tank around the top roller 35, bottom rollers 36 and 37, and top roller 38, the latter of which is by preference journaled in yielding boxes 39 for the purpose of pressing the returning apron B against the feed-roller 30 in such manner as to scrape or wring the starch from such apron. The apron finally passes around the end roller 40, which may be mounted similar to the roller 34 for a like purpose. Either one or both of the aprons may be wide or narrow, according to desire or requirements of the particular articles to be starched, and, in fact, the width of the starching-machine, as well as the width of the various rollers, including the saturating-rolls, may be varied as desired. When, however, the machine is working only on collars or cuffs, these aprons may be narrow bands of sufficient width to accommodate such articles.

Referring to Fig. 2, the gear 6 is a drive-gear and may be driven in any suitable manner. Such gear drives by means of an intermediate gear 41 the gear 42, which is secured to the shaft of the feed-roller 22. However, any convenient or approved method of gearing may be adopted for the purposes in view. Furthermore, as hereinbefore stated, the lower saturating-roll is driven by its upper roll, the said rolls being, in fact, in the nature of gears which intermesh, carrying the aprons into the meshes thereof.

In practice the articles to be starched, such as collars and cuffs, are in the present instance fed at the left-hand end of the machine, and when the feed-rollers 22 and 30 are reached the articles are held between the aprons and conveyed thereby through the machine and are finally delivered at the right-hand end of the machine. The collars and cuffs themselves encounter the saturating-rolls, and by reason of the peculiar and novel construction and operation of such rolls the collars and cuffs are moved up and down in the tank and are deflected first in one direction and then in another, this occurring several times, in substantially the same manner as the articles to be starched are deflected and rubbed between the hands when hand-starched. Furthermore, these saturating-rolls serve the purpose of forcing the starch through the articles to be starched, so that such articles will be thoroughly permeated and saturated with starch. Just as the aprons and the goods conveyed thereby are about to leave the machine, or rather the tank, they are pressed between the rollers 29 and 32, the former roller being spring-pressed, whereby all surplus starch is expressed from the aprons and from the articles starched.

It is preferable, but not essential, that the roller 25 should be a tension-roller similar to roller 27 and as shown in the drawings in order that the slack of the aprons might be effectually taken up on both sides of the gear-

rolls, thereby insuring proper and uniformity of action in the machine.

As hereinbefore stated, our invention is applicable to a dampening-machine, in which event the same structure as above described would be employed and water would be substituted for starch in the tank.

We claim—

1. A machine of the class described having, in connection with a tank, adapted to contain a suitable liquid, a saturating device located therein and consisting of a pair of hollow frames meshing with each other and each composed of rotatable end heads and a series of transverse rods between said heads, said frames being open from side to side, whereby the articles passing between such frames are exposed to the liquid at all points; substantially as described.

2. A machine of the class described having in connection with a tank to contain a suitable liquid, a saturating device located therein and consisting of a pair of similar intermeshing rolls or hollow frames, each comprising rotatable gear-shaped end heads and transverse connecting-rods between said heads, said frames being open and the respective rods of the frames cooperating and meshing to cause effective starching or dampening of the articles being operated upon; substantially as described.

3. A machine of the class described having, in connection with a tank to contain liquid, a saturating device therein comprising a pair of meshing rolls which are in the form of open-work cylinders open from side to side and between which the articles to be treated pass, whereby the articles are deflected and moved up and down in the tank in substantially constant contact with the liquid in the tank; substantially as described.

4. In a machine of the class described, the combination of two traveling aprons adapted to receive between them and convey the articles to be treated, and a pair of gear-like rolls consisting of intermeshing hollow frames open from side to side and between which the aprons pass; substantially as described.

5. In a machine of the class described, the combination of two traveling aprons adapted to receive between them and convey the articles to be treated, and a pair of rotatable intermeshing rolls between which the aprons pass, each roll consisting of a frame open from side to side, one of said rolls having a yielding movement with respect to the other; substantially as described.

6. In a machine of the class described, the combination of upper and lower traveling aprons adapted to convey the articles to be treated, a pair of intermeshing rolls between which said aprons pass, means located on opposite sides of said rolls to take up momentary slack in both aprons, and means for taking up the permanent slack in the upper apron; substantially as described.

7. The combination of a tank for starch or

water, two cradles mounted one in the other and removable from each other and from the tank, and saturating intermeshing rolls journaled in the cradles respectively and comprising hollow cylinders open from side to side; substantially as described.

8. A machine of the class described having a saturating device comprising a pair of cooperating rolls, each consisting of two rotatable end heads having radial projections with rounded ends and correspondingly-rounded spaces between said projections, and a series of rods or bars, extending between the projections of the end heads, the end heads and the series of rods of the two rolls intermeshing, the articles to be treated being passed between such rolls; substantially as described.

9. In a machine of the class described, the combination of traveling aprons adapted to convey the articles to be treated, a pair of gear-rolls between which said aprons pass and which cause an up-and-down movement and deflection of the aprons and spring-pressed rollers arranged at both sides of the gear-rolls and over which the aprons pass; substantially as described.

10. The combination with the tank 1 of an upper cradle 2 and lower cradle 3 loosely and removably arranged therein, a transverse shaft 5 journaled in the upper cradle, two end heads 7 secured to said shaft and having rounded gear-teeth, rods 10 between the teeth of said heads, means for driving said shaft, a driven shaft 12 journaled in the lower cradle 3, two end heads 13 secured to shaft 12 and similar to the heads 7, the two sets of heads and rods being adapted to mesh and to force starch or water into the articles passed between them; substantially as described.

11. A machine of the class described having, in connection with a tank adapted to contain a suitable liquid, a saturating device arranged in such tank and consisting of a pair of hollow frames meshing with each other and open at their central portions, each frame being composed of rotatable end heads connected by a series of transverse rods arranged at equal distances from the central axis of the frame; substantially as described.

12. In a machine of the class described, the combination of two traveling aprons adapted to receive between them and convey the articles to be treated, a tank for containing a suitable liquid, and a pair of intermeshing rolls arranged within the tank and between which said aprons and articles pass, each roll consisting of a hollow frame open as to its central portion and having rotatable end heads connected by a series of transverse rods arranged at equal distances from the central axis of the roll; substantially as described.

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