No. 858,705. PATENTED JULY 2, 1907.

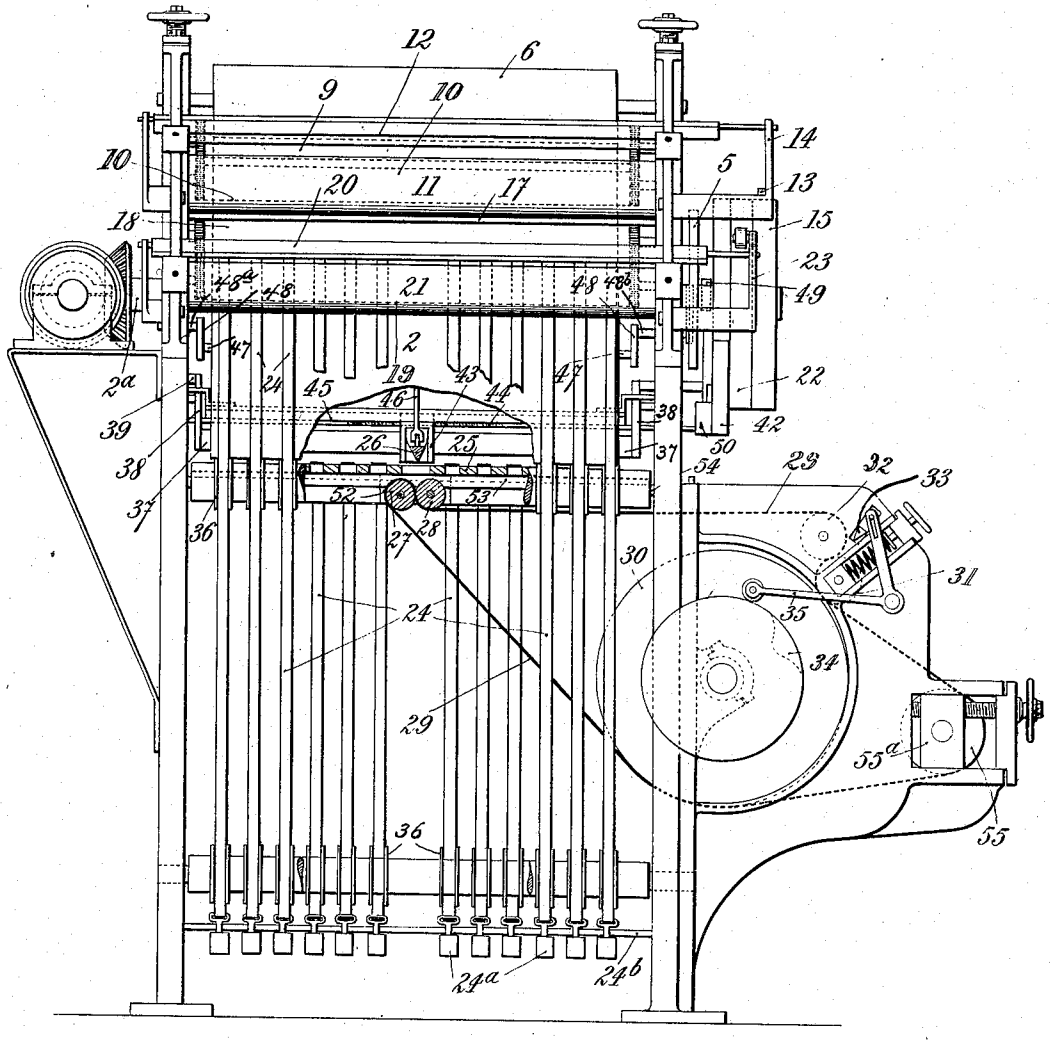
E. COLLON.

MACHINE FOR FOLDING, DRYING, AND IRONING ARTICLES OF LINEN.

APPLICATION FILED AUG. 27, 1904.

4 SHEETS—SHEET 1.

Fig. 1



Witnesses.
Harry L. Ames.
R. V. Sommers

Inventor.
Eugene Collon.
by Henry Orth & Son
Attys.

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4 SHEETS—SHEET 2.

Fig. 2

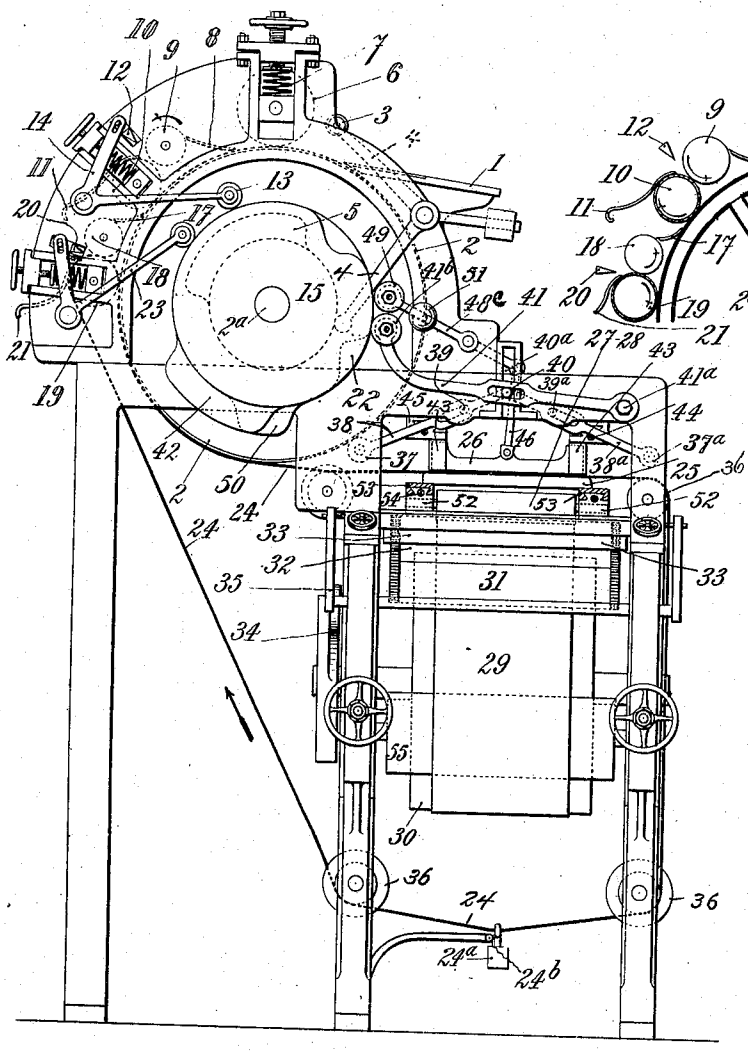
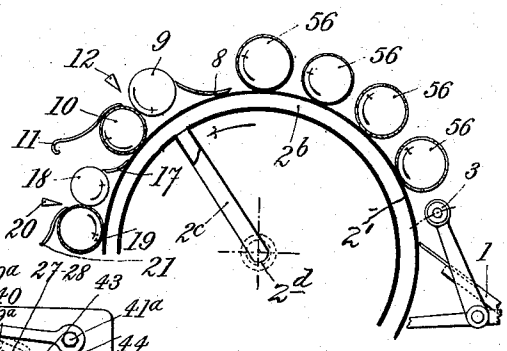


Fig. 3



Witnesses.
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4 SHEETS—SHEET 3.

Fig. 4

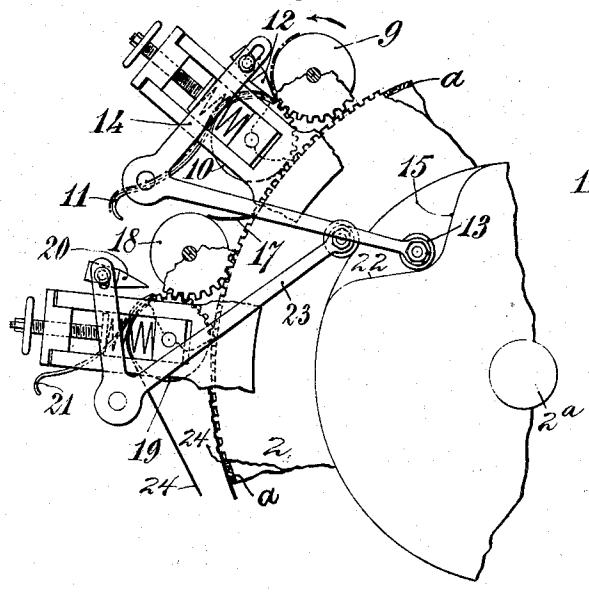


Fig. 5

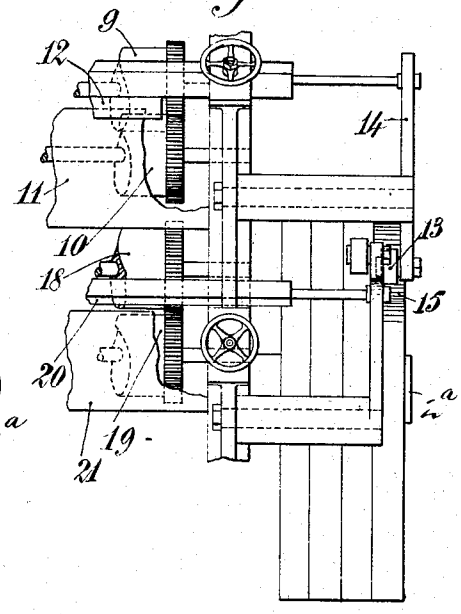
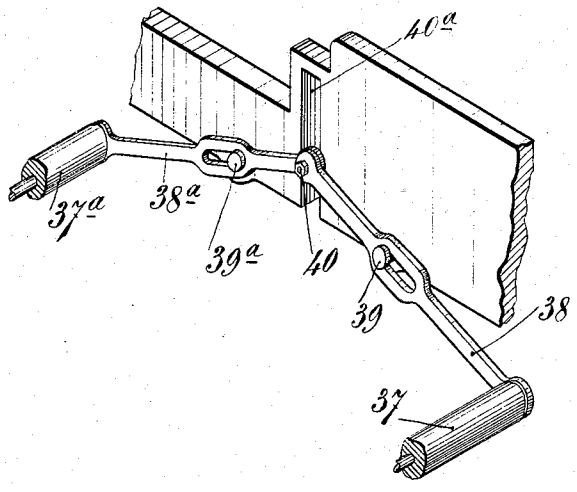


Fig. 6



Witnesses.

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A. Bonnmers

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4 SHEETS—SHEET 4.

Fig. 7

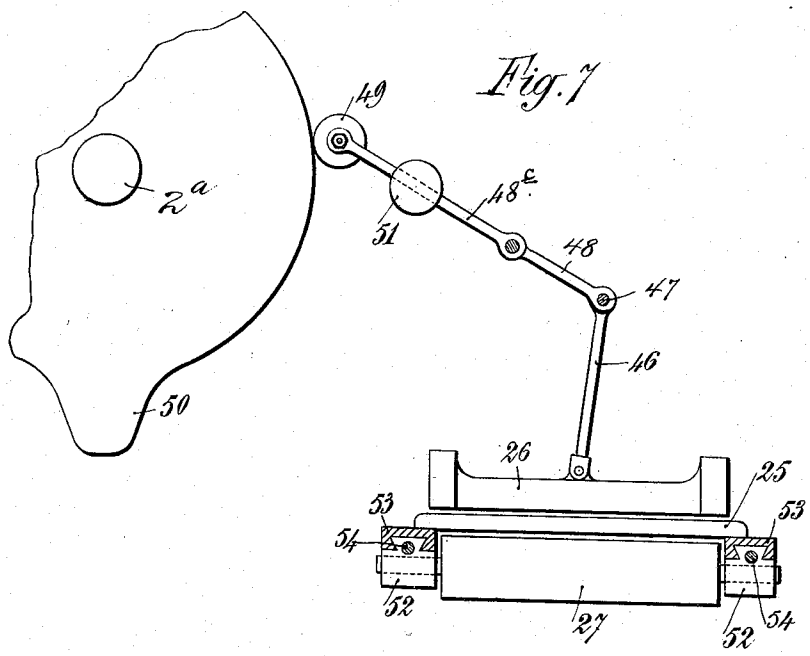
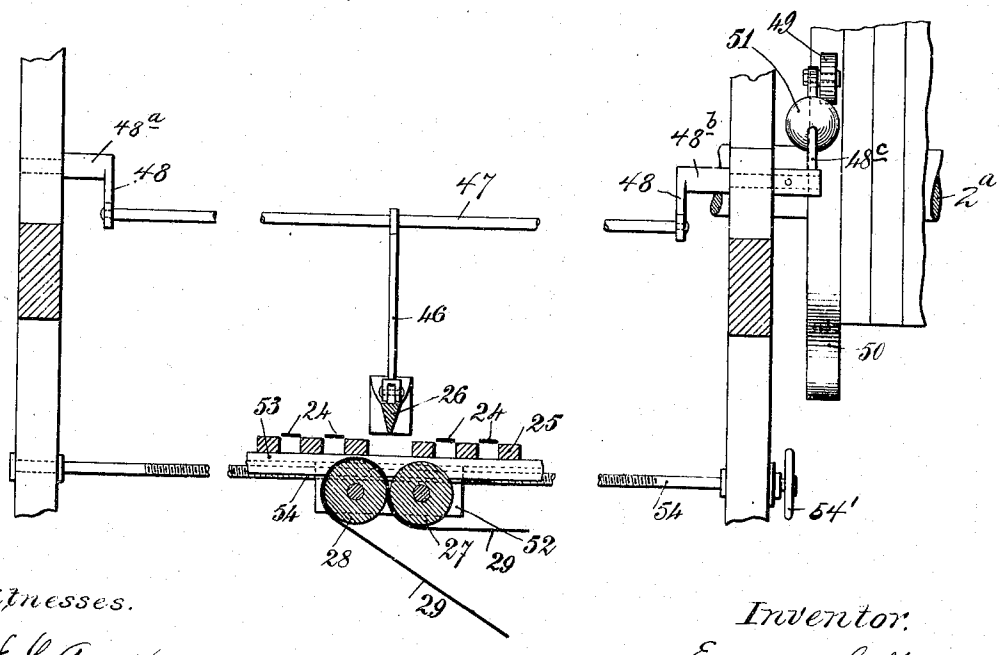


Fig. 8



Witnesses.

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B. Sommers

Inventor:

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by Munn & Co Attys

atty's

UNITED STATES PATENT OFFICE.

EUGÈNE COLLON, OF CANNES, FRANCE.

MACHINE FOR FOLDING, DRYING, AND IRONING ARTICLES OF LINEN.

No. 858,705. Specification of Letters Patent. Patented July 2, 1907.

Application filed August 27, 1904. Serial No. 222,460.

To all whom it may concern:

Be it known that I, EUGÈNE COLLON, a citizen of the Republic of France, and resident of 13 Rue de Cronstadt, Cannes, (Alpes-Maritimes,) in the said Republic, engineer, have invented certain new and useful Improvements in Machines for Folding, Drying, and Ironing Articles of Linen; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to a machine for folding serviettes and other articles such as handkerchiefs and the like which machine if desired can also accomplish the ironing and drying operations thus considerably reducing labor.

The machine chiefly comprises: a primary horizontal cylinder which takes up the serviette or other article in its movement and around which are mounted devices which produce the folds in the first desired direction; a horizontal grill device to which the serviette is next brought and deposited upon, by means of endless bands and upon which the serviette receives the first of the folds made at right angles to the folds which are accomplished by the devices above mentioned; lastly of a second cylinder, horizontal like the first but perpendicular thereto, on to which the serviette is brought by an endless apron, perpendicular to the endless bands and this cylinder produces one or several other folds in the second desired direction by means of devices similar to those used in connection with the first cylinder.

During its passage through the machine the serviette is constantly caught hold of by cylinders and rollers between which it is held or by endless bands or apron upon which it rests in such a manner as to be compelled to advance regularly without possibility of being displaced; this insures perfect and accurate folding at the places desired, seeing that on the other hand the folds are made by blades whose movements are governed by levers which are actuated by adjustable cams and the folds are then accentuated by pressure between rollers.

If instead of the machine performing only the folding operation it is desired that it shall dry the serviettes or other articles simultaneously it is only necessary to heat the two cylinders. If in addition it is desired to iron the articles at the same time there are placed around the heated cylinders a certain number of rollers which press the articles into close contact with the cylinders the rollers being revolved by contact with the moving articles and their surfaces being furnished or covered with felt in order to increase the adherence.

In order to enable the invention to be readily understood reference is made to the accompanying drawings in which

Figure 1 is an elevation of the improved machine a portion being removed in order to show the blade which performs the first fold in the second direction also the grill upon which the serviette is resting at this time and the endless apron which conduct the serviette to the second cylinder. Fig. 2 is an elevation seen from the right hand side of Fig. 1. Fig. 3 is a diagrammatic view showing the supplementary pressing rollers which are disposed about each of the cylinders as above stated when the machine is required to accomplish the drying of the linen. Fig. 4 is an enlarged detail view, in side elevation, of the mechanism which makes the first and second fold in the serviette. Fig. 5 is a partial elevation, seen from the left-hand side, of the parts shown in Fig. 4. Fig. 6 is an enlarged detail perspective view of the rollers for depressing the carrier bands. Fig. 7 is an enlarged detail view of the third folding devices, and Fig. 8 is a view, seen from the right of Fig. 7, some of the parts shown in section.

The machine and its mode of operation will now be described supposing that it is only required for folding. The serviette or other linen article that is to be folded is placed flat upon a table 1 and a roller 3 is lowered on to it and lays it on a cylinder 2 which rotates constantly and the surface of which is furnished with felt *a* or what is better caoutchouc; the serviette is carried round by the cylinder and is brought under a presser roller 6 which is pressed down by springs 7 and which in turn compels the serviette to accompany the cylinder 2 after which the roller 3 is again elevated. This movable roller 3 is mounted in one of the arms of a counterweighted three armed lever 4 another arm of which carries a roller which bears against a cam 5 keyed upon the shaft 2^a, of the cylinder 2. The serviette in further advancing comes upon a fixed guide 8 which extends to a roller 9 turning in the direction of the arrow Fig. 2, being driven by gearing Fig. 4 from another roller 10 which is driven from the main cylinder 2; the serviette in continuing its advance is thus brought on to a second fixed guide 11 and when it is in the required position for the formation of the first fold, the roller 13 upon a bell crank lever 14 falls into a recess in the cam 15 and causes the blade 12 to descend and make the fold and to pass the serviette between the rollers 9 and 10 which press the serviette between them thus accentuating the fold. The serviette having its first fold is now fed by the roller 10 on to a third fixed guide 17; it now arrives at the roller 18 which feeds it on to the fixed guide 21; when the serviette is at the desired point for the formation

of the second fold a notch in the cam 22 causes the bell crank lever 23 to lower the blade 20 which thus makes the second fold and passes the serviette between the rollers 18 and 19 which now take hold of it. The rollers 18 and 19 like the rollers 9 and 10 are connected by gearing, as shown in Fig. 4.

The apparatus shown in the drawings carries only two folding sets about the main or carrier cylinder 2 but it is evident that a larger number could be arranged according to the number of folds it is desired to obtain.

The serviette completely folded in one direction is now taken up between the cylinder 2 and endless bands 24 the latter pressing it against the cylinder. At a certain point the bands leave the cylinder and run horizontally carrying the serviette on to a horizontal grill 25 Figs. 2 and 7 which is arranged substantially level with the lowermost point of the periphery of the cylinder 2. When the serviette is over the grill the bands deposit it there and cease to carry it because at this moment the rollers 37, 37^a, Fig. 6 carried by the levers 38 38^a, descend upon the bands 24 and cause them to be lowered beneath the surface of the grill, the bands passing through the interstices of the latter.

The endless bands run over idle guide rollers 36 and to maintain the tension a weight 24^a is suspended from each band, a stop bar 24^b preventing the weights from being carried along by the bands. The levers 38, 38^a which support the axles of the rollers 37 37^a are slotted to receive the pivots 39 39^a and they are connected at their upper extremities with a horizontal pin or rod 40 which can be moved from end to end of the vertical guide way or slot 40^a by a lever 41. The lever 41 is pivoted at one end at 41^a to the framing and at the other end is provided with a roller 41^b which bears upon the cam 42 keyed upon the shaft 2^a of the main cylinder 2, in such a manner that the rollers 37 and 37^a depress the bands 24 at the proper moment in order that the serviette may be deposited upon the grill 25 as above described. When the serviette has arrived in this position a horizontal blade 26 arranged at right angles to the axis of the cylinder 2 descends upon the serviette to make the first fold in the second direction and to pass it between two rollers 27 and 28 which accentuate the fold by pressure.

In order to permit adjustment of the position of blade 26 so that it may either be opposite the middle point in length of the cylinder or to the right thereof according to whether the serviette is to receive four or three folds in the second direction, the extremities of the blade are guided in vertical grooves formed in guide-pieces 43, and these guide-pieces are movable along bars 45 by means of screws 44 which work in screw-threads formed in said guide-pieces. The vertical movement of the blade is controlled by a rod 46 connected thereto and to a rod 47 which latter is united with the ends of two crank-arms 48 on the ends of stub-shafts 48^a and 48^b pivoted in the framing of the machine. The shaft 48^b carries at its other end a crank-arm 48^c on which is mounted a roller 49 actuated by a cam 50 mounted on the shaft 2^a and a counterweight 51 carried by the crank-arm 48^c causes the blade 26 to be lifted, when the cam permits. In order to likewise adjust the position of the rollers 27, 28, the axles of these rollers are journaled in blocks 52, which have a dove-tailed portion (as shown in cross-section, Fig. 7) fitting into corresponding grooves formed in bars 53 of the frame, said blocks being screw-threaded to receive the threads on the screw rods 54 operated by hand wheels 54′.

Between the rollers 27 and 28 an endless apron 29 is passed in a direction at right angles to the bands 24 and it can always be maintained taut by moving the blocks 55^a which support the axle of the drum 55 over which latter the apron passes. When the serviette, folded the first time in the second direction, has passed between the rollers 27, 28, the apron conducts the serviette away, without the possibility of it sliding, towards the second cylinder 30 which is arranged at right angle to the first cylinder 2 and around which is placed the device which gives the serviette a second fold in the second direction. Other additional devices may be provided if it is desired to make one or several folds more.

When the serviette has passed from the horizontal part of the apron 29, a blade 33 makes the second fold and passes the serviette between the two rollers 31 and 32 of which the first is rotated by the cylinder 30 and drives the second by gearing; the apron 29 which passes partly round and between the rollers as shown in Fig. 1 of the drawing insure the passage of the serviette between the rollers although it then has a certain thickness and rigidity. The movement of the blade 33 is produced in the same manner as that of the blades which produce folds in the first direction, that is to say by means of the cam 34 and of the lever 35.

As described so far the machine only serves for folding, since the parts coming into contact with the linen are not heated; but it may be enabled to dry the goods by heating the two carrier cylinders 2 and 30 by steam or by any other convenient method. These cylinders are made of cast iron or preferably polished steel plate and are not covered with any material but on the other hand the rollers forming part of the folding devices which press thereupon may be covered with felt in order to obtain the same adhesion as before. Fig. 3 shows the cylinder 2′ as provided with an internal annular chamber 2^b into which steam is admitted through a pipe 2^c passing through the hollow shaft 2^d. If in addition the machine is to be used for ironing it is further necessary to arrange around the cylinders a certain number of presser rollers 56, Fig. 3, to compel the damp linen article to pass along in close contact with the cylinders. As the article remains upon the two cylinders 2 and 30 for a great part of their circumference the surfaces thereof are well utilized in the manner described.

Claims

1. In a folding machine, the combination with a rotating cylinder, of a pair of rolls mounted contiguous thereto, means to guide the article to be folded over the rolls and means for feeding said article between the rolls, whereby it is fed back onto the cylinder.

2. In a folding machine, the combination with a rotating cylinder, of a roll in frictional engagement therewith, a second roll driven from the aforesaid roll and means for feeding the article to be folded between the rolls to the cylinder.

3. In a folding machine, the combination with a rotating cylinder, a roll contiguous to the cylinder and rotating in an opposite direction thereto, a second roll in contact

with and driven from the aforesaid roll and rotating in the same direction as the cylinder, a blade contiguous to the point of contact of the rolls, and means for periodically advancing the blade toward said point of contact.

4. In a folding machine, the combination with a rotating cylinder, of a pair of oppositely rotating rolls mounted contiguous thereto, means for guiding an article from the cylinder onto one of the rolls, means for guiding the article from said roll over the other roll, and means to feed said article from the latter guide to the rolls.

5. In a folding machine, the combination with a rotating cylinder, of a roll in frictional engagement therewith, a second roll driven by the first roll and rotating in the same direction as the cylinder, a guide plate leading from the cylinder to the second roll, a guard plate leading from the latter roll over the adjacent roll, a blade, and means for periodically moving the latter between the second roll and guard plate.

6. In a folding machine, the combination with a rotating cylinder, of a roll in frictional engagement therewith, a second roll driven from the aforesaid roll, a guide plate leading from the cylinder to the second roll, means co-operating with the cylinder for feeding an article onto the guide plate, a guard plate to receive the article from the second roll and a blade adapted to swing into contact with the rolls.

7. In a folding machine, the combination with a rotating cylinder, of a pair of oppositely rotating rolls mounted contiguous thereto, a blade to feed the article to be folded to the rolls whereby it is fed back onto the cylinder, a second pair of oppositely rotating rolls mounted contiguous to the cylinder, a blade to feed the article to be folded to the last named rolls, and means to alternately actuate said blades.

8. In a folding machine, a grill, a plurality of endless bands traveling over the latter, and means to periodically depress said bands below the upper surface of the grill.

9. In a folding machine, a grill, a plurality of endless bands traveling over the latter, means to periodically depress said bands below the upper surface of the grill, and means to automatically raise the bands above the grill.

10. In a folding machine, a grill, a plurality of endless bands traveling over the latter, levers pivoted above the grill having their outer ends extending each side thereof and pivotally connected at their opposite ends, a lever connected with said pivoted ends, and means for periodically raising the last named lever.

11. In a folding machine, a grill, a plurality of continuously traveling endless bands passing over the grill, levers pivotally connected at one end having their opposite ends projecting on each side of the grill and mounted on pivots projecting through a longitudinal slot formed in each lever, an operating lever pivoted at one end connected with the pivoted ends of the levers, and a rotatable cam adapted to actuate the free end of the operating lever.

12. In a folding machine, the combination with a rotating cylinder, of a plurality of continuously traveling endless bands engaging the cylinder, a grill mounted beneath the bands, a cam rotating with the cylinder, longitudinally slotted levers mounted above the bands extending each side of the grill, a pin connecting the levers at one end, a roller on the outer end of each lever adapted to engage the bands, pins projecting through the slots on which the levers slide, a pivoted lever resting on the cam having a longitudinal slot to receive the connecting pin, and a vertical guide for the connecting pin.

13. In a folding machine, the combination with a rotating cylinder, of a plurality of continuously traveling endless bands engaging the cylinder, a grill mountd beneath the bands, mechanism to depress said bands below the upper surface of the grill, a blade mounted above the grill, mechanism to project the blade through the grill during the depression of the bands and a pair of rolls mounted beneath the grill.

14. In a folding machine, the combination with a rotating cylinder, of a plurality of continuously traveling endless bands engaging said cylinder, a grill mounted beneath the bands, a pair of rollers mounted on each side of the grill, levers carrying said rollers, a gravitating arm connected to said levers, a cam for raising said arm, a blade mounted above the grill, guides for the blade, a bell-crank lever connected with said blade, a cam to rock the bell-crank lever in one direction and a weight to return the latter to its normal position.

15. In a folding machine, the combination with a rotating cylinder, of a roller for pressing an article onto the cylinder, a plurality of rollers in contact with said cylinder, a pair of rotating rolls turning in contact with one another in a direction and at a speed required to give the linen the same advance movement as the cylinder, a blade and means to cause said blade to bear upon the linen at the place where the fold is to be made and to pass it into engagement with said pair of rotating rolls.

16. In a folding machine, the combination with a rotating cylinder, of means for heating the same, a roller, means for automatically lowering the latter to press the linen against the cylinder, a plurality of presser rolls for maintaining the linen in contact with the cylinder, a pair of rolls turning in contact with one another in the direction and at a speed required to give the linen the same advance movement as the cylinder, a blade, and means to advance the latter onto the linen at the place where the fold is to be made and carry it between the pair of rotating rolls.

17. In a folding machine, the combination of a rotating cylinder having an internal annular chamber, means for injecting a heating medium into said chamber, a roller, means to automatically move the latter into and out of engagement with the cylinder, a plurality of presser rolls adapted to contact with the cylinder to maintain an article thereon, a pair of contacting rolls; one of which is in contact with the cylinder, means to guide an article from the presser rolls over the contacting rolls, and an automatically operated blade adapted to be advanced onto the article at a predetermined period, whereby the article is fed between the rolls back onto the cylinder.

18. In a folding machine, the combination of a rotary cylinder having an internal annular chamber, a hollow shaft carrying the cylinder, a pipe connecting the shaft and chamber, a roller, means to periodically move the latter into and out of contact with the cylinder, a pair of contacting rolls driven by the cylinder, a plurality of presser rolls interposed between said roller and contacting rolls and in contact with the cylinder, means to guide an article to be folded from the presser rolls over the contacting rolls, a blade, and means to periodically advance the blade onto the article whereby it is fed between the contacting rolls back onto the cylinder.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EUGÈNE COLLON.

Witnesses:
HANSON C. COXE,
HENRY THIESSE.