O. FROBERG.

COLLAR AND CUFF STARCHING MACHINE.

APPLICATION FILED OCT. 20, 1917.

1,324,589.

Patented Dec. 9, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

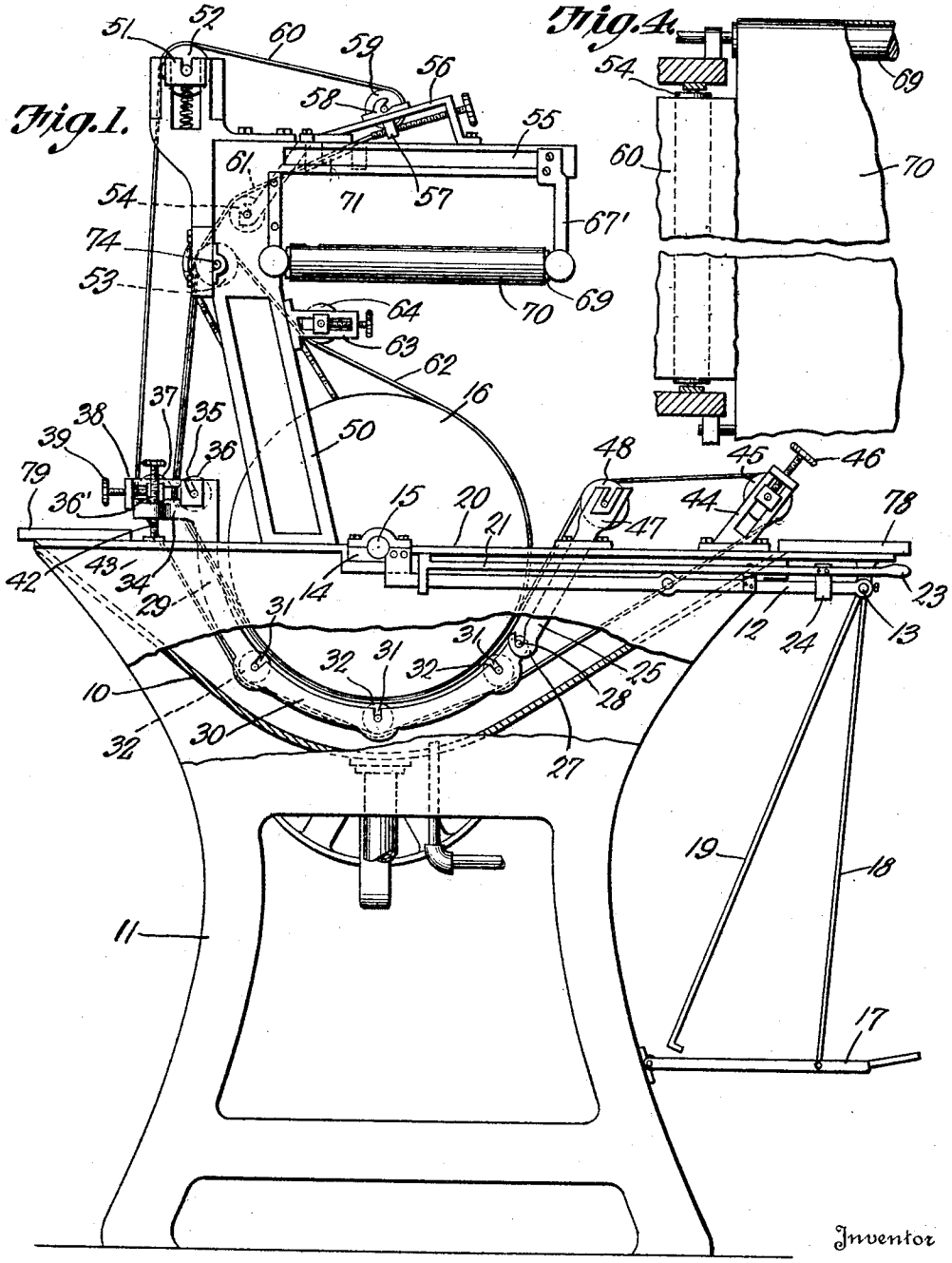


Fig. 4.

Witness

Ed. R. Lusby

Chas. Nilsen, Jr.

Inventor

Olof Froberg

By H. S. Woodward

Attorney

O. FROBERG.

COLLAR AND CUFF STARCHING MACHINE.

APPLICATION FILED OCT. 20, 1917.

1,324,589.

Patented Dec. 9, 1919.

3 SHEETS—SHEET 2.

Fig. 2.

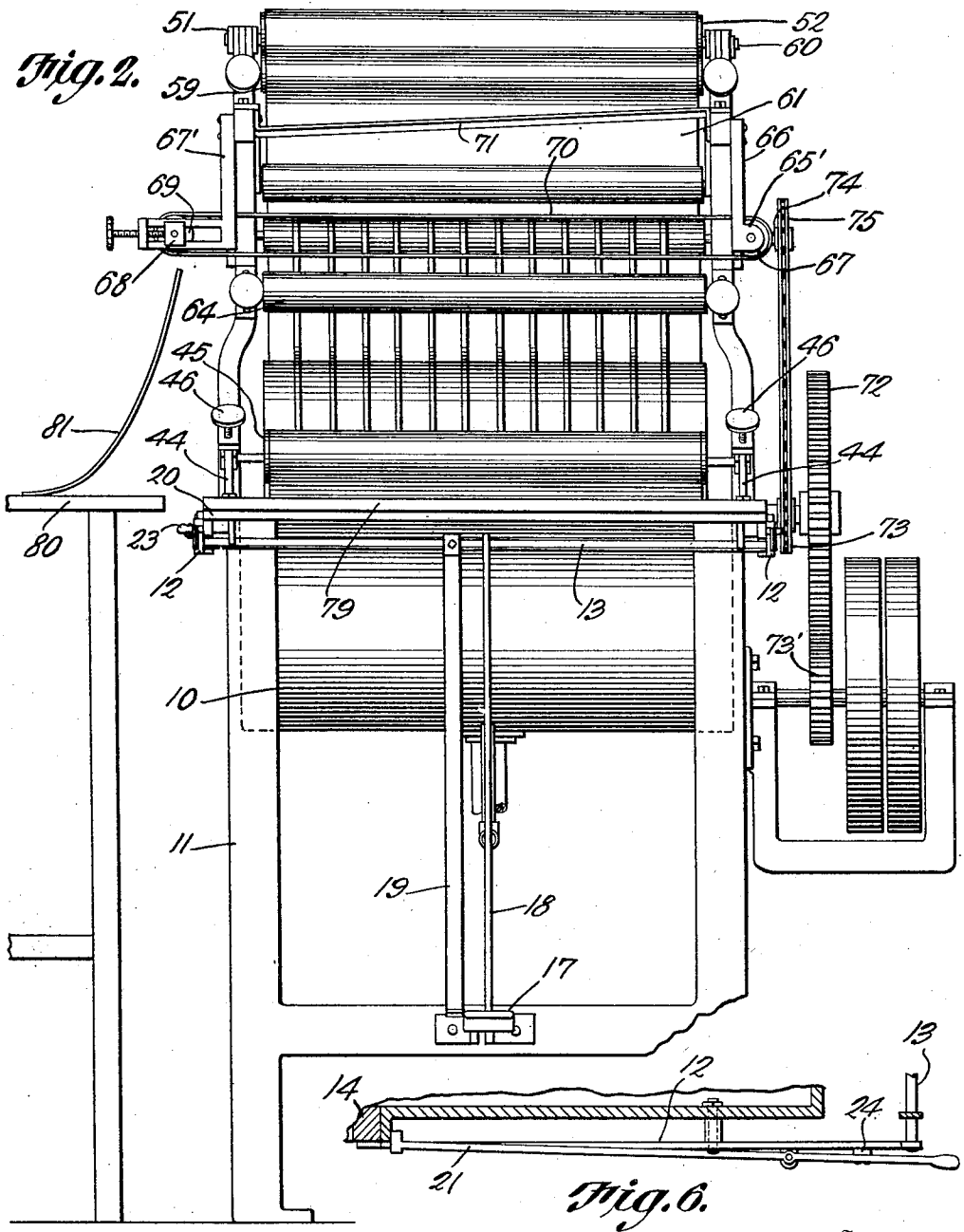


Fig. 6.

Inventor

Witness

Ed. R. Lusby

Chr. Nielsen, Jr.

Olof Froberg

By H. S. Woodward

Attorney

O. FROBERG.

COLLAR AND CUFF STARCHING MACHINE.

APPLICATION FILED OCT. 20, 1917.

1,324,589.

Patented Dec. 9, 1919.

3 SHEETS—SHEET 3.

Fig. 5.

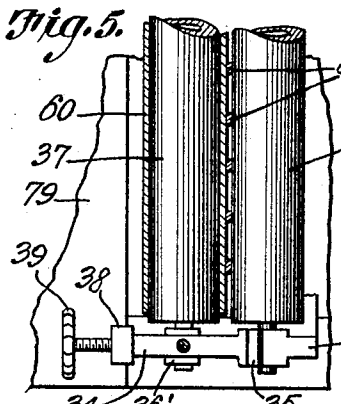


Fig. 3.

Inventor

Olof Froberg

Witness

Ed. R. Lusby

Chas. Nielsen, Jr.,

By H. L. Woodward

Attorney

UNITED STATES PATENT OFFICE.

OLOF FROBERG, OF BENTON HARBOR, MICHIGAN.

COLLAR AND CUFF STARCHING MACHINE.

1,324,589. Specification of Letters Patent. Patented Dec. 9, 1919.

Application filed October 20, 1917. Serial No. 197,634.

To all whom it may concern:

Be it known that I, OLOF FROBERG, a citizen of the United States, residing at Benton Harbor, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Collar and Cuff Starching Machines, of which the following is a specification.

This invention has for its object to effect improvements in collar and cuff starching machines calculated to improve the quality of work turned out thereby, to simplify the manipulations involved in the operation of such machines, as well as manual operations involved in adjustment, cleaning, and care of the machines and to cheapen the manufacture of the machines.

It is an important aim to improve upon a number of details in machines such as illustrated in my prior patent issued October 26th, 1915, Number 1,158,040.

In said prior machine, the feed throat was of such character that danger was involved for the operator of catching the fingers between the feed roller 23 and the large platen roller 22, in addition to which quite rapid work and more sustained attention to the work after initial adjustment thereof upon the conveyer web was required than is involved in my machine, wherein the arrangement of the web is such that emplacement of the work for feeding to the machine may be accomplished at a considerable distance from the throat space, and much less attention and manipulation of the work in feeding is required. This enables the use of a wider web if desired, or a more rapid movement of the machine, whereby its output may be greatly increased without the necessity for additional operative labor.

In my prior machine, in the passage of the work from the main conveyer to the transverse delivering conveyer, the work was considerably disordered, and at times pieces tangled together, in the space between the inverted reach of the web 42 and the transverse conveyer, necessitating considerable work on the part of the operators subsequently in straightening out the pieces and arranging them in orderly fashion, so that they could be conveniently handled, and would not have wrinkles therein when fed to the ironing machine.

In my present device, I have made certain changes which while not involving radically new structural features have been such as to produce a marked change in the character of the work, eliminating the necessity for the hand labor previously required in ordering the pieces and flattening the work prior to the ironing, as mentioned.

In the first machine, also, a roller 85 was located at the inner side of the large platen roller, adapted to bear thereagainst or against the interposed web and work so as to remove the surplus starch from the work passing between the rollers, an adjustment being provided for the roller whereby proper pressure would be exerted for the removal of the proper quantity of the starch. The small roller was carried upon an adjustable frame by which certain other rollers were also adjusted with relation to the platen roller, these other rollers being provided to work the starch into the fabric while passing through the machine, before reaching the roller 85, by which the surplus starch was removed. In the prior machine the adjustment of the movable frame for proper positioning of the starch working rollers would destroy the adjustment of the roller 85, and require a new manipulation of the adjusting means therefor. In my present invention the movable frame is adjusted as desired for securing the proper action from the starch working rollers, without destroying the adjustment of the means whereby surplus starch is removed, (which means I term "finishing rollers,") these being carried upon the device in such a way as not to be interfered with by the adjustment of the movable frame, while yet being carried thereon.

The construction of the finishing means has also been greatly simplified and cheapened, and the mounting and construction of the movable framing for the working rollers also simplified and improved.

My machine also embodies an improved means for lifting out the platen roller quickly to enable the removal of pieces which may have been improperly fed thereto, before they have passed completely

through the machine, or for other purposes. This device also includes a novel and desirable means for securing the platen roller releasably in operative position in an effective and satisfactory manner.

Additional objects, advantages and features of invention will appear in the invention, involved in the construction, arrangement and combination of parts, one of the possible embodiments of which are set forth in the following description, and shown in the drawings in the application, in which,

Figure 1 is a side elevation of the machine,

Fig. 2 is a front elevation thereof,

Fig. 3 is an elevation of the right hand side of the machine,

Fig. 4 is a detail of the clearing device at the discharge end of the main conveyer.

Fig. 5 is an enlarged detail of the finishing device,

Fig. 6 is a top view of the latching lever for the platen roller lift.

There is illustrated a starch pan 10, supported by a suitable stand or frame work 11, which may be of any suitable kind. The pan has gradually sloping bottom portions at the front and rear parts, the bottom preferably sloping more gradually at the front part, so that the pan is quite wide at the top. Pivoted adjacent the forward side of the supporting frame 11 at each end, there are levers 12, of the first class, having outer ends projected beyond the frame and connected by a transverse bar 13, by which they are held in a common plane. At their inner ends, the levers 12 carry bearing blocks 14, extending inwardly, the upper edge portion of the frame 11 being suitably recessed to form a rest for these blocks when at the lower limit of their movement, but leaving them free for upward movement under oscillation of the levers as will be described. Upon these blocks 14 there are revolubly secured the trunnions 15 of a large platen roller 16, the uses of which will be subsequently apparent. A foot treadle 17 is pivoted in a convenient position upon the lower part of the frame 11 from which a link 18 is extended to the central part of the cross bar 13, so that the levers 12 may be operated by the treadle to lift the roller 16 from its normal position. A stop rod 19 is also carried by the cross bar 13, having its lower end so positioned as to strike against the frame 11 to limit upward movement of the roller 16 in a proper manner.

The upper edge portion of the frame is formed with an overhanging flange 20, and pivoted upon the lever 12 at one side, or at each if desired, being so illustrated in the present instance, there is a locking lever 21, oscillable in a plane transversely of the lever 12. In normal position, the lever 21 extends at its inner part closely over the lever 12, and is formed with an inward extension adapted to engage under the flange 20 when at the inner limit of its movement, so as to prevent lifting of the lever 12 at its inner part. This extension also rests upon the upper side of the lever 12. The outer end of the lever 21 is provided with a handle portion 23, for its manipulation, and a suitable spring 24 is provided on the side of the lever 21 bearing against the lever 12 upon its outer side, so as to hold the lever 21 in locking position.

Secured on the upper part of the frame 10 at each side immediately in front of the roller 16 there are hanger arms 25, extending downwardly within the pan 11, and being inclined slightly toward the rear at their lower part, so as to lie closely under the roller 16 at a proper level. The lower ends of these hangers are formed with hook portions 27, receiving the projecting end portions of a transverse rod 28, carried in a roller frame 29, which comprises two similarly shaped elements 30, each having a curved lower part adapted to lie in parallel relation to the periphery of the roller 16, and having a plurality of slots 31 therein opening upon the inner edges of the members 30, in which are set the trunnions of starch working rollers 32, adapted to be adjusted in close bearing upon the roller 16 by movement of the rear part of the frame 29 upwardly. The side members 30 are each provided with a rearward extension 34, extending approximately in a horizontal direction when the frame 29 is in normal position. At the upper forward part of the extension in each case, a slot 35 is formed, opening on the upper edge of the extension, and extending slightly in a forward direction toward its lower part, forming a bearing for the trunnions of an expressing roller 36 of a size to lie spaced a distance from the roller 16 when in normal position, as shown. The outer part of the extension 34 is bifurcated to form parallel guide arms, between which a sliding bearing 36′ is mounted, carrying revolubly one end of an expressing roller 37, for movement to bear against the roller 35, and for adjustment as desired. Across the outer end of the extension a cross piece 38 is mounted, in which there is revolubly engaged a hand screw 39 threaded in a suitable manner in the bearing 36′, whereby the latter may be adjusted longitudinally in the extension 34. Set in a lateral enlargement of the extension at each side there is a suitable screw 42 bearing upon the frame 10. The screw may be rotated to adjust the frame 29 with relation to the roller 16. At the forward part of the machine, diagonal slide bearings 44 are mounted at each side on the upper edge of the frame 10, inclined forwardly toward their upper part,

and having a roller 45 slidably mounted therein and adjustable by means of a hand screw 46 by which the roller 45 may be drawn outwardly or inwardly as desired. The upper end of the arm 25 is extended slightly above the upper edge of the frame 10, and slotted to form an open bearing 47, in which is trunnioned the roller 48, some distance forwardly of the roller 16. The last mentioned roller and the roller 45 are nearly on the same level, although in adjustment of the roller 45 some change in their relative level may occur.

Upon the upper side of the frame 10 between the rests for the blocks 14 and the rear side of the frame 29, suitable standards 50 are provided, inclined slightly toward the rear and carrying at their extreme upper part a vertically movable spring supported bearing block 51, having an open slot in the upper side in which rests the trunnions of a web roller 52. At a lower position on the standards nearly or quite over the roller 36 a similar roller 53 is mounted, extending between the standards 50, while above this roller and spaced a short distance forwardly thereof another similar roller 54 is mounted between the standards. The standards are formed with horizontal forwardly extending arms 55, upon the upper side of which there is provided an inclined planiform guide 56, at each side having a central slot therein, through which projects an arm 57 of a slide bearing 58 mounted on the guide, this bearing having a slot formed therein inclined upwardly and forwardly, and being open for the reception of the trunnions of an adjustable web roller 59, so that the roller may be lifted out of the bearing at times without the removal of any nuts, bolts or other bearing parts. An endless web 60 of a suitable material is mounted so as to circulate upon the rollers described, forming a conveyer. This web may be said to have an outer portion forming the return part of the conveyer, and an inner portion serving as the work carrying part. The outer portion extends over the roller 59, over the roller 52 and downwardly therebeside, to the roller 37, upon the outer side of which it rests, passing downwardly therefrom and under all of the rollers 32, from the most forwardly of which the web extends to the roller 45, beneath which it passes, thence upwardly and over it in a rearwardly direction to the roller 48, forming a table reach at the beginning of the inner part of the conveyer, passing then over the roller 48 and downwardly convergently to the periphery of the roller 16, against which it engages a distance below the top of the frame 10, although this particular relation is not essential, though it is desirable that the web should be slightly inclined before it engages the last mentioned roller. From the underside of the roller 16 the inner section of the web 60 passes between the rollers 36 and 37, thence upwardly rearwardly of and over the rollers 53 and 54 forming therebetween an oblique reach, and thence forwardly at an acute inclination with respect to the horizontal, to the underside of the roller 59, forming in this last portion what is termed an "inverted reach" 61. Guiding tapes 62 are engaged around the roller 16, being extended upwardly and rearwardly therefrom between the rollers 36 and 37 in close relation to the inner portion of the web 60, and extending also upwardly and forwardly around the roller 53, from which the tapes return to the roller 16. Mounted upon the forward side of the standards 50, there are slide bearings 63, and these bearings carry a tightening roller 64 bearing against the guide tapes 62, and being adjustable in a familiar manner to take up slack in the tape as desired, this roller being adjustable in the same manner as the rollers 45 and 37 before described.

Upon the standard 50 at the right hand side of the machine a bearing 65 is provided, and upon the outer end of the arm 50 carried by this standard a bearing 65′ is provided upon a suitable bracket 66, these two bearings supporting a horizontal roller 67 extending longitudinally of the machine. At the opposite side, upon the standard 50 and a bracket 67 at the outer end of the arm 50, slide bearings 68 are provided, carrying a roller 69, in a manner similar to the mounting of the rollers 45 and 38 before mentioned, whereby it may be adjusted horizontally to the right or to the left. Around the rollers 67 and 69 an endless cross apron or conveyer 70 is mounted, adapted to receive work passing over the roller 54 and falling from the inverted reach of the web 61. A clearing knife 71 is mounted between the standards at a suitable point, having an edge portion directed against the web 60 at a suitable angle, a short distance outwardly of the roller 54, but located inwardly over the apron 70 a suitable distance, as will be understood. The knife is also arranged diagonally across the inverted reach 61.

The shaft 15 of the roller 16 is extended outwardly at the right hand side of the machine, and carries a large gear 72, inwardly of which a sprocket 73 is secured upon the shaft. The gear 72 may be driven by any well known power connection, as shown at 73′, or otherwise. The shaft 74 of the roller 53 is also extended beyond the righthand side of the frame, and provided at its outer part with a sprocket 75, and inwardly of the sprocket a beveled gear 76. This last mentioned roller is on a level with the roller 67 of the cross apron, and the shaft of the last mentioned roller is extended and provided with a beveled gear 77 meshed with

the gear 76 on the shaft 74. In this manner the cross apron is operated, without requiring special counter shaft and bearing for the connection.

In use, the machine being operated so that the roller 16 rotates to move its forward side downwardly, the web 60 passing through the starch provided in the pan 11 becomes coated therewith before moving into the "table reach" and the operator thus is afforded a convenient place upon which to arrange the work as it passes into the machine, being able to remove attention from the work after it is once adjusted. By reason of the coating of starch upon the web, the articles are not liable to casual movement after arrangement upon the table reach, and as the web passes over the roller 48 the work will continue to lie closely against the web until it passes into engagement with the roller 16. The frame 29 being properly adjusted, the rollers 32 will work the starch through the pieces carried under the roller 16, and as the web passes between the rollers 36 and 38 all surplus starch is removed and the work is carried by the tapes 62 and web 61 upwardly and over the rollers 53 and 54, the work having a tendency to cling to the web 61 until loosened by the knife 71 before mentioned, owing to the fact that there is no bend of great degree between the ascending reach, the oblique reach and the inverted reach. The work therefore passes outwardly over the roller 54, until engaged by the knife 71 which turns the work downwardly until it strikes against the cross apron 70, the upper side of which moves toward the left hand side of the machine. As the end portions of the work strike against the cross apron after leaving the web 61, the apron pushes these end portions toward the left. The flattened and stiffened condition of the work due to the effect of the finishing rollers 36 and 37 causes it to resist wrinkling or bending, as it is removed from the conveyer 60 by the knife 71, it is caused to curl so that the upper side of the work leaving the web 60 becomes turned downwardly against the apron 70. The liability of crumpling or wrinkling the work is thus obviated and it is delivered in well ordered form. By having the apron 70 move at a more rapid rate than the web 61, this effect is enhanced, although it is not as essential in this form of my machine as in the prior construction. It is important that enough space be provided between the inverted reach and the transverse conveyer, for, if too close together, the work will not be ordered and enabled to curl, as described, and it will be crumpled and disordered.

However, it is thought desirable to have the cross apron 70 operate at a much higher speed than the web 60 in order that as soon as one piece of work is cleared from the web 60 entirely, it will be rapidly discharged at the side of the machine and moved out of the way of other work.

For convenience of the operator, the frame 10 supports table portion 78 and 79 on a level with its upper edge, at front and rear, the levers 12 and 21 and the pedal 17 being extended so as to lie in convenient relation to the table 78. A receiving table 80 is also provided at the left hand side of the machine to receive the work discharged from the cross apron, this table having a plate 81 extended upwardly therefrom to lie at its upper part close under and to the right of the outer part of the roller 69, the lower part of the plate being curved toward the left, so that the work as discharged from the cross apron will slide down upon the plate 81 to the table 80 without becoming disordered or wrinkled.

What is claimed:

1. In a laundry machine, an endless conveyer operative in a given path, including an inverted reach, a coöperating tape having portions parallel thereto and stopping short of the said inverted reach, means to separate fabrics from said first conveyer, a transverse conveyer located a distance under said inverted reach sufficient to cause turning and inversion of fabrics progressively as described when turned downwardly from the inverted reach, and operative connections for the conveyers, said means to separate fabrics from the first conveyer being located over said transverse conveyer.

2. In a machine of the character described, an endless belt conveyer having a lift portion and an inverted reach leading therefrom, a small roller engaging the lift portion at its upper part, a tape extending parallel to the conveyer below said roller and passing closely therearound for return, a second small roller above and laterally of the first roller engaging the conveyer to form an oblique reach leading to the inverted reach, for the purposes described, a transverse conveyer located closely below the second roller, and means to separate fabrics from the first conveyer over the second conveyer.

3. In a machine of the character described, a pan, levers of the first class pivoted at respective sides of the pan for vertical oscillation and having alined bearings at their inner ends, rests therefor, a second lever oscillable laterally of the first named levers, the rest and last named lever having portions constructed to interlock with one of the first named levers to prevent upward movement of the bearings, and means to operate the first named levers.

4. In a machine of the character described, a pan, levers of the first class pivoted at respective sides of the pan on a common axis fixedly connected and having alined bear-

ings on their ends adjacent the middle of the pan, a roller mounted therein, means to secure the bearings in normal position, including a lever pivoted on one of those first mentioned, means on said pan and said last named lever constructed, and said last named lever being movable, for interlocking engagement when the first named levers are in initial position, and means to operate the first named levers.

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

OLOF FROBERG.

Witnesses:
I. W. RIFORD,
MILDRED PYKE.