J. W. ROBERTS.

TEXTILE APPARATUS.

APPLICATION FILED JUNE 9, 1917.

1,312,874.

Patented Aug. 12, 1919.

2 SHEETS—SHEET 1.

FIG. 1

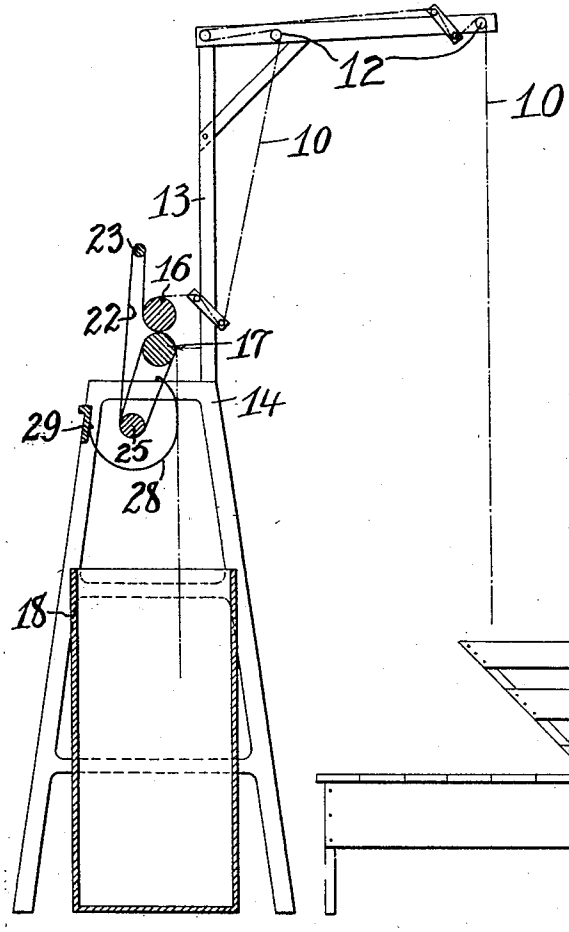


FIG. 2

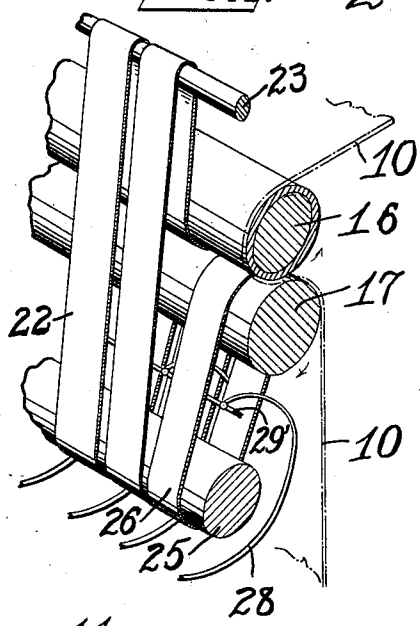
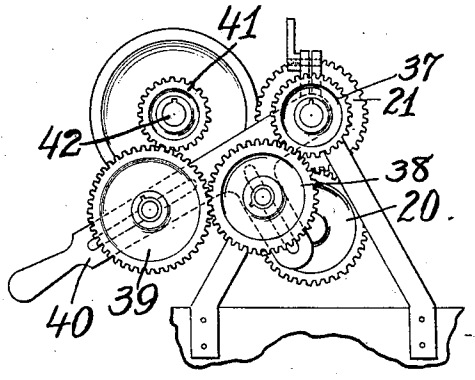


FIG. 3



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Fig. 4

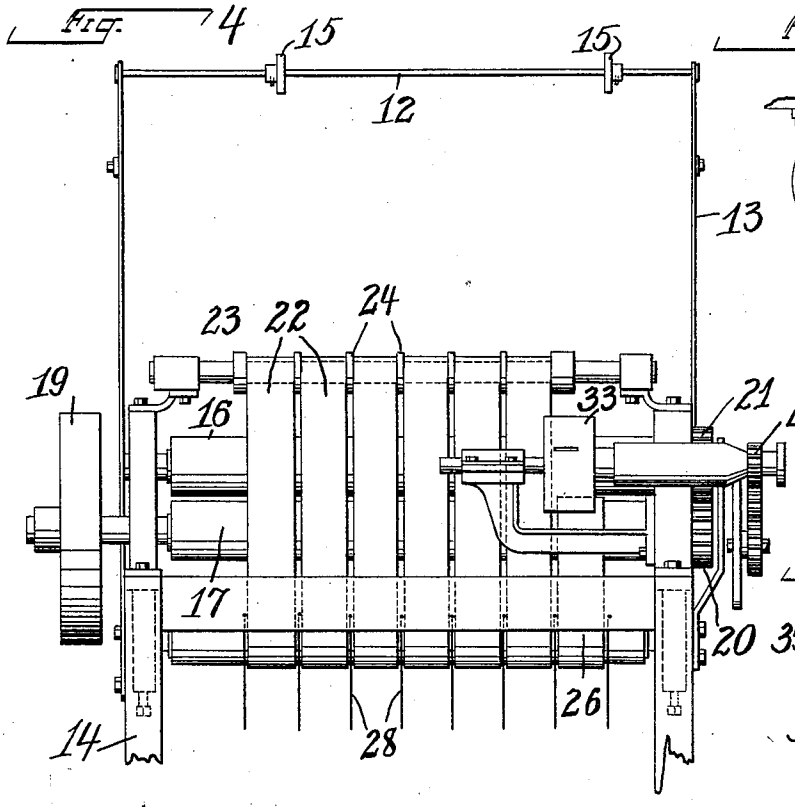


Fig. 5

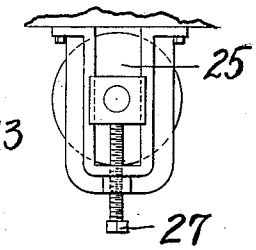


Fig. 6

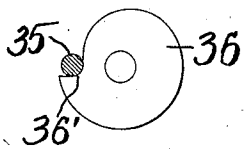


Fig. 7

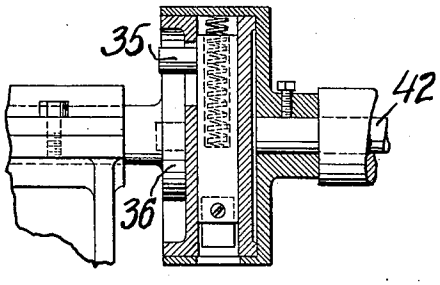


Fig. 8

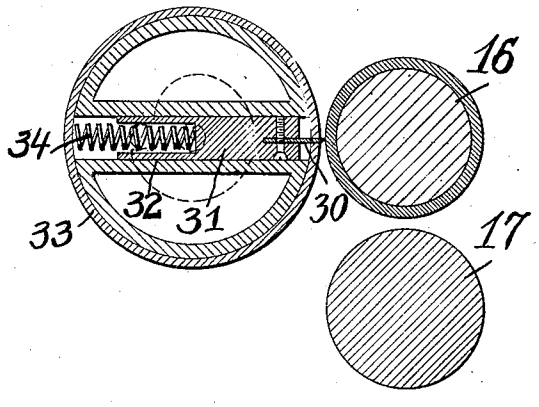
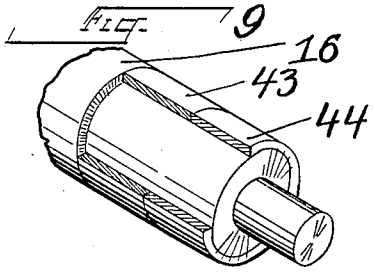


Fig. 9



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TEXTILE APPARATUS.

1,312,874. Specification of Letters Patent. Patented Aug. 12, 1919.

Application filed June 9, 1917. Serial No. 173,736.

To all whom it may concern:

Be it known that I, JOHN WM. ROBERTS, a citizen of the United States, and a resident of Passaic, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Textile Apparatus, of which the following is a specification.

This invention relates to textile apparatus, and more particularly to machines for operating on fabric, as, for example, for marking, crimping or cutting the same along the edges or elsewhere at predetermined intervals.

An object of the invention is the provision of means whereby the operations on the fabric are performed by tools, such as cutting tools, marking tools and the like, which move forward along with the fabric and in the same direction.

Another object of the invention is to provide for an adjustment so as to increase or decrease the measured spaces between the markings, cuttings or the like, performed on the fabric, and for this purpose devices similar to the change gear mechanism made use of in turning lathes may be utilized.

Another object of the invention is the provision of novel means for feeding the fabric to the rolls by which it is advanced, and for assuring the feeding contact which is necessary to prevent slipping, and whereby the fabric is held in proper alinement in the machine.

A further object of the invention consists in the provision of novel means for cutting the fabric at predetermined intervals along its edges, such cuts being provided, as for instance, in the case of handkerchiefs for defining spaces where the strip of fabric may be torn across so as to form regular squares or rectangles from which the finished articles may be made up.

Other objects of my invention will appear from the following description, and with the foregoing and related objects in view my invention consists in the devices, constructions, arrangements, parts and improvements herein set forth and claimed.

In the accompanying drawings wherein the same reference numerals are uniformly used to designate the same parts throughout, Figure 1 is a vertical sectional view. Fig. 2 is a perspective view of the rollers and belts. Fig. 3 is a side view of the measuring apparatus. Fig. 4 is a front view of the upper part of the machine, and Figs. 5, 6, 7, 8 and 9 are detail views partly or wholly in section.

10 is a sheet of fabric and is supplied from any suitable source, as the crate or box 11, and is passed through suitable supporting and tensioning devices, as rollers 12 supported in a light framework 13 which may be secured to the machine frame 14, and at least one of such rollers 12 is preferably provided with adjustable gages or guides 15 for securing correct alinement of the fabric. Other means for supplying the fabric and for retarding or tensioning its movement, may, of course, be substituted for those shown. The fabric is drawn through between rollers 16 and 17, preferably passing over and around and beneath the roller 16 and down behind the roller 17, whence it is discharged into any suitable receiving means as a box 18. The rollers 16 and 17 are journaled in any suitable way and are driven at the same speed, and the drive may be obtained through means such as a pulley 19 secured to the roller 17, the roller 16 being driven therefrom by suitable means, such as the gear 20 on the roller 17 and the gear 21 on the roller 16 meshing therewith. While the fabric may be passed directly between the rollers without the assistance of other devices for holding it in place and keeping it properly alined, I preferably provide a series of belts 22 formed of any suitable material as canvas, strips of blanket cloth, felt or the like, and the same preferably are passed between the rollers 16 and 17 and serve to assist in holding the fabric 10 in its passage.

The belts 22 may pass over an upper roller 23 provided with spacing collars 24 intermediate the belts 22, between the rollers 16 and 17 and downward under a roller 25, and then back again over the roller 23. Where space is desired for operating upon the fabric 10 in its passage, as for marking it or cutting the edges thereof, the elongated belts 22 would be in the way, and in such regions I may provide a short belt or belts 26 passing over the rollers 17 and 25 only and not extending upward so as to interfere with access to the upper roller 16, or all the belts may be of such shortened form and the upper roller 23 dispensed with, if desired, and various other forms of means for guiding and assisting in the holding of the fabric 10 in its passage through the roll-

ers 16 and 17 may be resorted to. The roller 25 is preferably adjustable as by means of a screw 27 so as to get the best uniform tension upon the belts 22 and 26. In order to prevent the fabric 10 from catching in the guiding belts or rollers, and in order to prevent its being attracted toward such belts 22 and 26 by static electrical action or otherwise, I provide means for guiding the fabric 10 away from the roller 25 and belts 22 and 26, and in the form shown a series of curved fingers 28, made of suitable material, such as light brass wire, are provided and are extended into the spaces between the belts as clearly shown in Figs. 1, 2 and 6, and the same are supported in any convenient way, as, for example, from a bar 29 attached to the framework of the machine 14, and may be secured together at or near their opposite ends, as by the rod 29'.

The means for marking or crimping the fabric, or starting a cut in the edge thereof, is preferably placed opposite the roller 16, across the face of which the fabric 10 is moved, and also opposite a shortened belt or belts as 26, whereby access to the roller 16 and the fabric passing thereover is provided. Such means are made to travel substantially with the roller 16 and the fabric 10 passing thereover so that substantially a rolling contact between the fabric and the marking, cutting or other operating means is provided. While the fabric and the operating means move in the same direction, they do not necessarily move at precisely the same speed, though they are preferably caused to move at as near the same speed as can practically be obtained. In the form shown the operating means is rotated in the opposite sense from the roller 16 so that when the same approach one another they are moving in the same direction, and in the form shown the means for operating on the fabric 10 has the form of a knife for cutting the edge of the fabric so that the same may be separated by tearing across where the cuts are started, such cuts being evenly spaced apart and means being provided for varying the spacing so that the distance between the points of operation on the fabric may be greater or less, as desired. This is a convenience in the production of square sections of fabric, as, for example, for the manufacture of handkerchiefs, and in such case the markings or cuttings or crimpings, or whatever operation is performed on the fabric, may be spaced apart a distance equal to the width of the strip of fabric, or, if desired, the distances therebetween may be greater or less than the width of the fabric according to the character of the articles desired to be produced. Such operations do not in any case shear off or sever portions of the fabric, and the same is delivered in a continuous strip with only markings, edges, cuts or the like therein at regular intervals.

The operating device in the form shown, consisting, as stated, of a narrow cutting knife for making short cuts at or near an edge of the fabric, is indicated by the reference numeral 30 and is secured to a slide 31 which is slidably mounted in the slideway 32 in a rotatable member 33, and a spring 34 is provided behind the slide 31 and serves, when the slide 31 is released, to project said slide and the knife 30 so that the latter strikes the roller 16, cutting the fabric passing over this roll. The member 33 is rotated by means which will presently be described, and the slide 31 is provided with a laterally projecting pin 35 which travels in contact with a cam 36 held stationary as by being secured to a bracket or other suitable supporting means. The notch 36' in the cam 36 is placed substantially opposite the center of the roller 16, so that when, in the rotation of the member 33, the knife 30 comes opposite the roller 16, the bar 31 and knife 30 carried thereby is released, and the knife 30, under the action of the spring 34, is forcibly projected against the roller 16, thereby producing a cutting action, or in case other operating means, as crimping or marking means, are provided, the action of the slide 31 under the operation of the spring 34 serves to perform such appropriate effect corresponding to the particular operating means employed.

The means shown in the present instance for rotating the member 33 consists substantially of a speed change gear such as is customarily used, for example, in turning lathes, and comprises a gear 37 on the shaft 16 and gears 38 and 39 on the bracket 40 pivoted to turn on the shaft 16 or an extension thereof and a gear 41 on the shaft 42 of the rotary member 33. By substituting for the gear 41 similar gears but of different sizes, it will readily be seen that the member 33 is rotated from the shaft 16 at any desired rate of travel, and there being two idler gears 38 and 39 between the gears 37 and 41, the member 33 and the roller 16 rotate in opposite directions, whereby their approaching sides turn in the same sense.

The portion of the roller 16 opposite the operating member 30 is formed of material adapted to properly coöperate with the operating device. For cutting the edges of cloth, as for handkerchief manufacture, I have found that it is desirable to provide the knife 30, and also that portion of the roller 16 opposite the same, of hardened tool steel, and I find that if constructed of this material the parts may be continued in operation substantially indefinitely without any substantial dulling of the tool or marking

or indenting of the portion of the roll with which the tool contacts. Such hardened surface may have the form of a bushing 43 of hardened tool steel as stated, and the same may be fastened in place by any suitable means, as, for example, by an end bushing 44 which may be of cast iron or of any other suitable material, or the hardened steel surface provided in the portion of the roller opposite the cutting knife may be provided in other ways than as shown.

The operation of apparatus in accordance with the invention will be readily understood from the foregoing. The fabric to be operated upon is passed through the rollers in the manner described, and gears of suitable character to secure the desired spacing are chosen and placed in the transmission apparatus whereby the operating member, as the knife 30, will come into operation repeatedly and contact with the fabric 10 at the desired intervals. Power is applied to the rotating means, as the pulley 19, and the material is drawn through the rollers, being held in contact therewith and in alinement by the belts provided for that purpose, and as it is fed forward the member 33 rotates and each time the operating member, as the knife 30, comes opposite the roller 16, it is released by the cam 36, whereupon the operating member, as the knife, is forcibly thrust against the roller 16, performing its appropriate function upon the fabric passing over said roller, and as such operating member is moving in the same sense as the fabric, there is no holding, tearing or blurring action such as would result from contact with the moving fabric of a stationary marking or cutting tool which did not have movement in the same sense as the fabric. Such slight disparity of movement between the fabric and the operating device as may exist is comparatively small so that for the small distance during which contact is maintained, the relative movement is substantially negligible.

I have found that apparatus in accordance with the invention very greatly simplifies operations involving marking or cutting of fabric at predetermined intervals, and that, for example, for the making of edge cuts in handkerchief fabrics, it is possible, with a machine is accordance with the invention, to dispense with the services of several operatives who have heretofore been employed to make such starting cuts by wrapping the fabric upon separated pins and then starting the cuts by hand with a knife or other similar tool, and at the same time very much more accurate and satisfactory work is done and it is possible for one attendant to take care of a number of these machines, it being only necessary, as one strip of cloth is about to be exhausted, to pin or otherwise fasten an additional long strip of cloth to the end of the one passing through the machine, or, of course, the subsequent strips may be started through the apparatus independently, though this is not the preferable mode of procedure as it involves some loss of time and some additional trouble over the simple expedient of fastening the strips together before the last end of the first strip has been used up. It is to be noted that in feeding in the starting end of the strip of fabric, the provision of the blankets or belts 22 greatly simplifies and facilitates the operation, as the forward end of the strip need only be held against the rear sides of the blankets or belts 22 above the roller 16, whereupon the same will be fed into and through between the rollers 16 and 17 by the moving strips or belts with which they are held in contact.

It is to be understood that the form shown and described is for the purpose of affording a clear understanding of my invention only, and that numerous changes and modifications may be made therein without departing from the invention.

Having thus described my invention, I claim:

1. A textile apparatus comprising positively driven feed rollers between which a sheet of fabric is passed, said fabric being of a nature to make initial tearing difficult, and movable cutting means, said cutting means being disposed so as to cut spaced transverse short cuts in the edge of the fabric.

2. In a textile apparatus, a pair of rollers between which a sheet of fabric is passed, a set of endless belts adapted to pass through between said rollers with the fabric, the fabric being unsevered and hanging freely after passing between said belts, and means for preventing the hanging fabric from coming into contact with said belts.

3. In a textile apparatus, a pair of rollers between which a sheet of fabric is passed, a series of endless belts adapted to pass through between said rollers with the fabric, the fabric being unsevered and hanging freely after passing between said belts, and a series of spring fingers extending between adjacent belts and adapted to keep the fabric away from said belts after it has passed through between the rollers.

4. A textile apparatus comprising rollers between and by which a sheet of fabric is continuously fed, said fabric being of a nature to make initial tearing difficult, and cutting means movable with the fabric and disposed so as to cut spaced transverse short cuts in the edge of the fabric, which cuts indicate the places at which the fabric is to be torn.

5. In a textile apparatus, a pair of rollers between which a sheet of fabric is adapted to

passed, rolls above and below said pair of rollers, endless belts passing around said rolls and between the rollers with the fabric, and a shorter belt passing around the lower roller and the lower roll and leaving the upper roller exposed at one end thereof, and means opposite the exposed portion of said upper roller for performing operations upon an edge of said fabric where it is passed over said roller.

6. In a textile apparatus, the combination of means for advancing a sheet of fabric and comprising a feed roller over which the fabric is passed, rotating means opposite said feed roller, and means for rotating said rotating means in the opposite direction from said roller so that adjacent sides thereof are moving in the same direction, and a knife in said rotating means and adapted to strike against the surface of said feed roller and cut the interposed fabric.

7. In a textile apparatus, the combination of means for advancing a sheet of fabric and comprising a feed roller over which the fabric is passed, a member rotated from said roller and placed opposite the same, a spring projected knife on said member adapted to strike directly against the outer surface of said feed roller, and means for releasing said knife when it is brought opposite said roller during the rotation of said member.

8. In a textile apparatus, means for advancing a sheet of fabric including a roller having a hardened wear surface extending entirely therearound, a rotating knife opposite said roller, and means for projecting said knife against said roller whereby fabric may be cut between said knife and said hardened surface.

9. In a textile apparatus, the combination of means for advancing a sheet of fabric and comprising a roller, rotating means opposite said roller and comprising a knife, spring means for projecting the knife into striking contact with the roller, and means including change speed gears for turning said rotating means from said roller.

10. In a textile apparatus, the combination of means for advancing a sheet of fabric and comprising a roller, a rotating hollow shell opposite said roller, a slide-way in said shell, a knife in said slide-way, a spring for projecting said knife, and a stationary cam member for retracting said knife and maintaining said spring in contracted condition, said cam member being provided with a recess, the wall of said recess making an abrupt shoulder with the cam surface, whereby said knife is released when it comes opposite said roller, and forcibly projected by said spring into contact therewith.

11. In a textile apparatus, the combination of a rotating roller of completely cylindrical form and of a rotating knife opposite said roller, spring means for projecting said knife, stationary cam means for controlling the movement of said knife and having a recess therein, a wall whereof forms an abrupt shoulder with respect to the cam surface, and change gear means whereby said knife is rotated from said roller.

12. In a textile apparatus, means including a roller for advancing a sheet of fabric, said roller having a section of hardened steel extending entirely around the roller, a knife of hardenel steel opposite said hardened steel portion of said roller, and means for projecting said knife against the hardened part of the roller at any rotative position thereof.

In testimony that I claim the foregoing, I hereto set my hand, this 4th day of June, 1917.

JOHN WM. ROBERTS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."