F. R. EVANS.

CLOTH PRINTING MACHINE.

APPLICATION FILED JULY 12, 1920.

1,406,948. Patented Feb. 14, 1922.

2 SHEETS—SHEET 1.

Fig. 2.

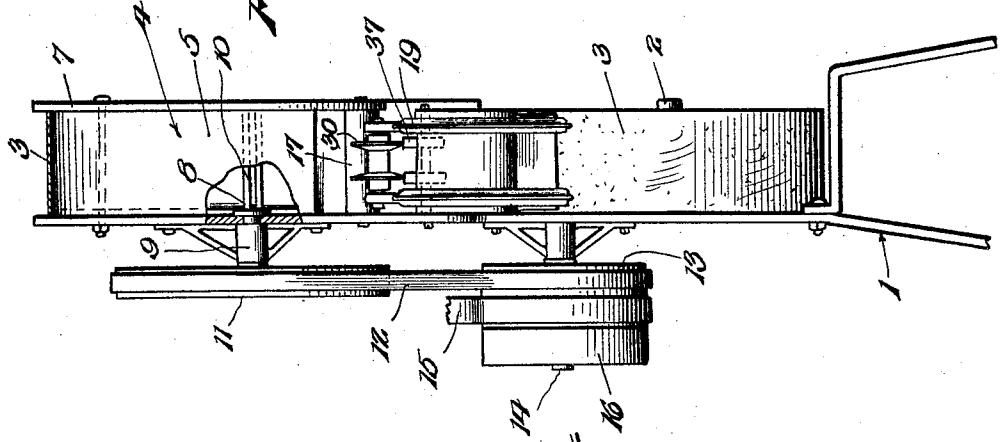
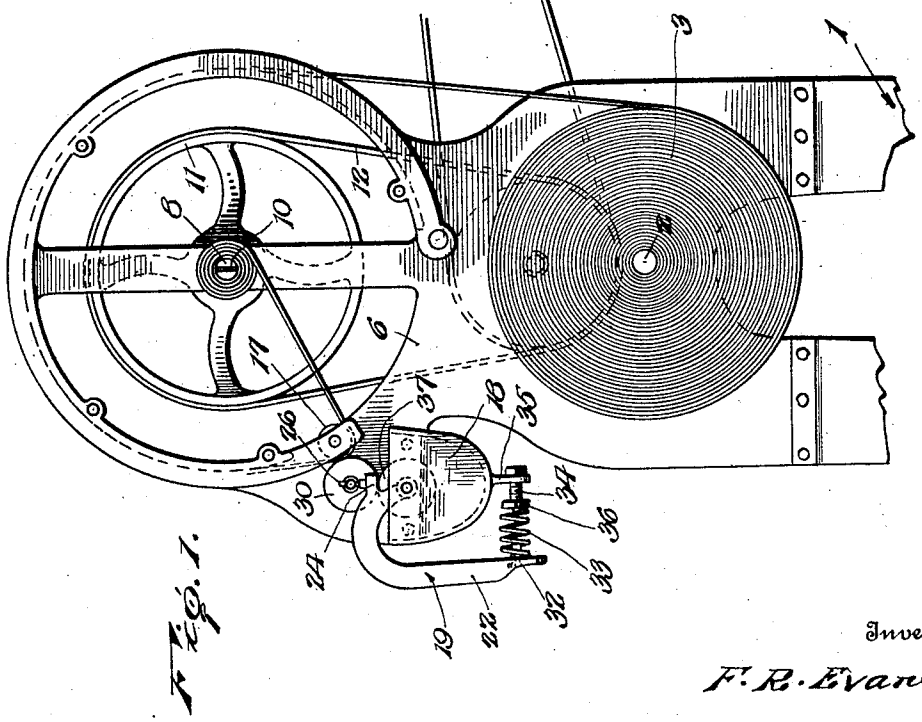


Fig. 1.



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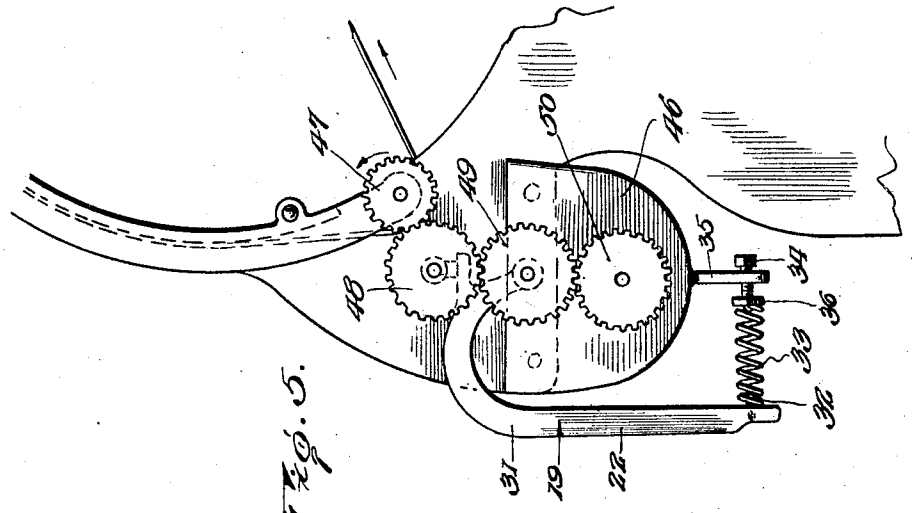


Fig. 5.

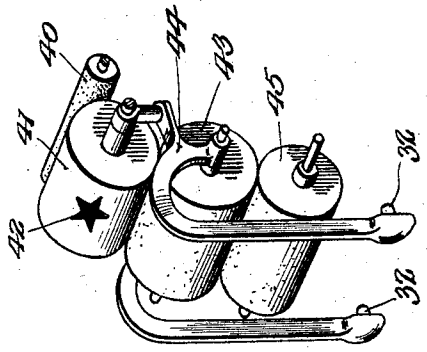


Fig. 4.

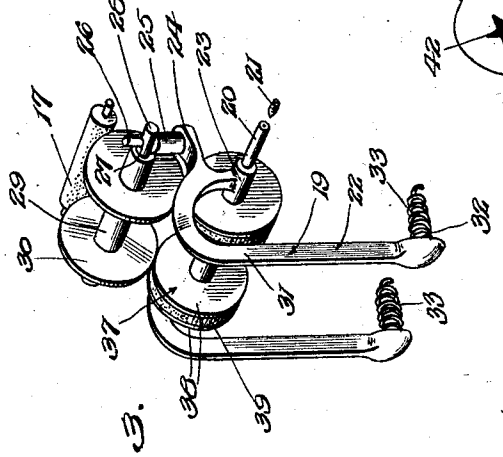


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANK R. EVANS, OF ZANESVILLE, OHIO.

CLOTH-PRINTING MACHINE.

1,406,948. Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed July 12, 1920. Serial No. 395,433.

To all whom it may concern:

Be it known that I, FRANK R. EVANS, a citizen of the United States, residing at Zanesville, in the county of Muskingum, and State of Ohio, have invented certain new and useful Improvements in Cloth-Printing Machines, of which the following is a specification.

This invention relates to cloth printing machines and while the machine is designed primarily for use in printing lines, figures, or designs of various kinds upon a strip of cloth which is run through the machine, the principles of the invention may find embodiment in cloth printing machines for various other purposes.

In Letters Patent granted to me February 25, 1919, No. 1,295,720 for gauntlet cuff and method of producing the same, there is disclosed the idea of printing upon a cuff blank one or more longitudinally extending lines in imitation of stitching or, if desired, various other designs. In the manufacture of these gauntlet cuff blanks, the blanks are cut from a long strip of cloth material ordinarily stored in roll form and it is therefore the primary object of the present invention to provide a printing machine constructed for continuous operation to print the desired design upon the face of a strip of such cloth material as the strip is unwound from the roll in the automatic operation of the machine, the printing operation being in this manner expeditiously performed and in an inexpensive manner.

I have observed that in drawing a strip or sheet of cloth from a roll it is necessary, if the same is to be drawn evenly and not subject to distortion, to somewhat tension the strip or sheet and therefore it is another object of the invention to provide in a cloth printing machine, means for effectually tensioning a strip of cloth as it is passed through the machine so that there will be no likelihood of distortion of the said strip.

In the machine embodying the present invention the cloth passes from the storage roll over the tensioning means which is provided and past the impression mechanism and is then wound into another roll, and it is a further object of the invention to provide a novel and particularly compact arrangement of the various component parts of the machine and one which will possess peculiar advantages and which will be presently more specifically set forth.

Another object of the invention is to provide an improved impression mechanism in a machine of this class.

In the accompanying drawings:

Figure 1 is a side elevation of the machine embodying the present invention;

Fig. 2 is a front elevation of the machine, parts being broken away and the cloth strip being shown in section where it passes over the tensioning means;

Fig. 3 is a perspective view of a portion of the impression mechanism removed from the machine.

Fig. 4 is a view similar to Fig. 3 illustrating a modification of this mechanism;

Fig. 5 is a side elevation illustrating the gear system employed in connection with the form of the invention shown in Fig. 4.

In the drawings the numeral 1 indicates in general the frame of the printing machine embodying the present invention and this frame may be of any desired construction and as it in itself forms no part of the present invention it need not be specifically described. Mounted upon and projecting from one face of the upper portion of the frame 1 is a stub shaft or spindle 2 upon which may be placed the roll of cloth 3 which is to be printed upon in the operation of the machine, the roll of cloth being merely slipped onto the said shaft or spindle and being adapted to be unwound by being pulled from the roll.

From the roll 3, the strip of cloth as it is unwound is passed over a tensioning means which in this embodiment of the invention is in the nature of a friction drum indicated in general by the numeral 4. The said drum 4 comprises a body 5 which is of cylindrical form being interrupted, however, at the forward portion of its lower side as indicated by the numeral 6 so as to leave an opening for a purpose which will presently be described. This body 5 is provided with side flanges 7 which project beyond the outer surface of the cylindrical body and which serve as guides to prevent the strip of cloth slipping off from the body or becoming laterally displaced. This friction tensioning drum is mounted upon the same side of the frame as the shaft or spindle 2 and the center of the circle described by the drum is preferably located substantially vertically above the shaft or spindle 2. The outer cylindrical face of the body of the drum is preferably smooth so that the cloth will not

be interfered with in passing over the drum but it will be evident that the frictional contact of the cloth with the said face of the body of the drum will offer sufficient resistance to the travel of the cloth to suitably tension the same so that it will not become distorted.

The numeral 8 indicates a shaft which is rotatably mounted in a suitable bearing 9 upon that side of the frame opposite the side upon which the drum and spindle 2 are mounted, one portion of the shaft 8, however, extending axially into the drum 4 as clearly shown in Fig. 1 of the drawings and being slotted as at 10, longitudinally, so as to adapt the foremost end of the strip of cloth to be connected therewith. Of course, when the strip of cloth is so connected and the shaft is rotated, the strip will be wound upon the shaft. In order that the shaft 8 may be rotated for the purpose stated, a pulley 11 is fixed upon the shaft beside the bearing 9 and a belt 12 is trained about this pulley and a similar pulley 13 mounted upon an idle shaft 14 upon the frame 1. A belt 15 is likewise trained about the pulley 13 and serves to transmit power to the said pulley, and an idle pulley 16 is likewise mounted upon the shaft so that the power belt 15 may be shifted to position thereon when it is desired to stop the operation of the machine.

The strip of cloth passes from the roll 3 over the friction tensioning drum from the rear to the forward side thereof at which latter side of the drum it is passed about an idle roll 17 which serves likewise as the platen of the impression mechanism of the machine. After passing over the platen 17, the strip winds onto the shaft 8, the said shaft being continuously rotated.

The impression mechanism shown in Figs. 1 to 3 inclusive is designed primarily for printing longitudinal lines, in imitation of stitching, upon the strip of cloth as it passes over the platen 17 and this mechanism will now be described. The numeral 18 indicates the ink font or basin which is mounted in any suitable manner upon the frame of the machine and the numeral 19 indicates in general a frame which is mounted to rock upon a shaft 20 disposed within the upper portion of the font, bearing screws 21 being threaded through the opposite side or end walls of the font and journaling the ends of the said shaft. The frame 19 comprises members 22 each of which includes a bearing sleeve 23 fitting the said shaft 20 and provided with a rearwardly extending substantially horizontally disposed finger 24. These fingers are provided with upstanding bosses 25 terminating in studs 26 which studs fit through openings 27 formed in the ends of a spindle 28 upon which is mounted a sleeve shaft 29 carrying impression wheels or disks 30 the peripheries of which continuously contact the cloth as the cloth is drawn over the platen 17. The side members 22 of the frame 19 further include arms 31 which are extended forwardly and thence downwardly and which at their lower ends and at their rear sides are provided with studs 32 engaged by the forward ends of springs 33. The rear ends of these springs fit over the ends of bolts 34 which are fitted through a flange 35 projecting downwardly from the bottom of the font 18, the said last mentioned ends of the springs bearing against nuts 36 which are adjustably threaded upon the bolts and which when adjusted serve to vary the tension of the said springs 33. The said springs 33 urge the lower ends of the arms 31 in a forward direction and consequently normally hold the frame 19 so rocked as to cause the peripheries of the impression wheels 30 to bear more or less firmly against the cloth passing over the platen 17. In the present instance two of the impression wheels 30 are employed so that two parallel lines will be printed upon the strip of cloth as it passes through the machine but if desired only one such wheel may be employed or I may make use of more than two of such wheels. Furthermore, the peripheries of the wheel may be designed so as to make an impression of a corresponding design upon the cloth. In order that ink may be supplied from the font 18 to the peripheries of the impression wheels 30, inking wheels 37 are mounted upon the shaft 20 and preferably comprise spaced metallic heads 38 and an intermediate filling 39 of felt, rubber, or in fact any material suitable for the purpose and which possesses the desired degree of yieldability. The impression wheels 30 and inking wheels 37 are in peripheral contact and, of course, as the strip of cloth travels past and in contact with the peripheries of the impression wheels 30, these wheels will be rotated and, being in peripheral contact with the inking wheels, the latter wheels will likewise be rotated so as to take up the ink and continually furnish a supply thereof to the peripheries of the inking rolls.

Figs. 4 and 5 of the drawings illustrate a slightly modified form of impression mechanism, this form being designed especially for use where it is desired to print upon the strip at suitable intervals, some special design or figure as for example a star as shown in the said Fig. 4. In these figures the numeral 40 indicates the platen which corresponds to the platen 17, 41 an impression roll having upon its peripheral surface a raised design or figure 42 which constitutes alone the printing surface of the said roll. This roll 41 takes the place of the impression wheels 30 previously described,

and the surface 42 is supplied with ink by an inking roll 43 mounted in a frame 44 which is identical with the frame 19 previously described. Ink is in turn supplied to the roll 43 by a take-up roll 45 which operates in an ink font 46 which corresponds to the font 18. It will be understood that the impression roll 41 and distributing roll 43 are not in peripheral contact except for the surface 42. Fig. 5 of the drawings illustrates clearly the gearing for driving the several rolls and in this figure the numeral 47 indicates a pinion which is fixed upon the shaft for the platen 40 and which meshes with a pinion 48 fixed upon the shaft for the impression roll 41. The pinion 48 meshes with a pinion 49 fixed upon the shaft for the distributing roll 43, and the said pinion 49 in turn meshes with a pinion 50 fixed upon a shaft for the ink supply roll 45. Of course, the passage of the strip of cloth over the platen 40 will serve to rotate this platen and, by the system of gearing described, rotary motion, will be imparted to the several rolls 41, 43 and 45.

From the foregoing description of the invention it will be evident that the cloth as it is unwound from the storage roll 3, is continuously carried through the machine, the impression mechanism likewise operating continuously and the said cloth being so tensioned as to effectually prevent its distortion. It will also be evident that by leading the strip of cloth from the platen 17 through the opening 6 and winding it upon the shaft 8 which shaft is located within the bounds of the friction tensioning drum 4, an exceptionally compact arrangement is provided for taking up the cloth and storing the same as it is acted upon by the impression mechanism.

Having thus described the invention, what is claimed as new is:

1. In a cloth printing machine, a friction tensioning drum, cloth winding means operating within the circumference of the drum to draw the cloth to be printed over the said drum, a platen located at a point in the circumference of the drum, impression means, and means urging the impression means in the direction of and for cooperation with the said platen.

2. In a cloth printing machine, a friction drum, means within the circumference of the drum for winding a strip of cloth to be drawn about the surface of the drum and printed, a revolvable platen roll over which the cloth is to be drawn prior to passage to the winding means, impression means, and means urging the impression means in the direction of and for cooperation with the said platen roll.

3. In a cloth printing machine, a friction tensioning drum, cloth winding means operating within the circumference of the drum and operable to draw the cloth to be printed over the said drum, and impression means.

4. In a cloth printing machine, a friction tensioning drum, cloth winding means operating within the circumference of the drum and operable to draw the cloth to be printed over the said drum, and impression means, the said drum being open at a point in its circumference and the said impression means being located at one side of the open portion of the drum and including a platen over which the cloth is drawn prior to passing to the winding means.

5. In a cloth printing machine, a friction tensioning drum, cloth winding means operating within the circumference of the drum and operable to draw the cloth to be printed over the said drum, and impression means, the said drum being open at a point in its circumference and the said impression means being located at one side of the open portion of the drum and including a platen over which the cloth is drawn prior to passing to the winding means, the said impression mechanism also including a rotary impression element arranged in operative relation to the platen.

6. In a cloth printing machine, a roll supporting means, a friction tensioning drum located above the said means and having an opening in its periphery adjacent its under side, a cloth winding means operating within the circumference of the drum to take up cloth passing from the storage means over the said drum and through the opening in the periphery of the drum, and impression means operating at one side of the said opening.

7. In a cloth printing machine, a roll supporting means, a friction tensioning drum located above the said means and having an opening in its periphery adjacent its under side, a cloth winding means operating within the circumference of the drum to take up cloth passing from the storage means over the said drum and through the opening in the periphery of the drum, and impression means operating at one side of the said opening and including a rotary platen over which the cloth is passed prior to passing to the winding means.

8. In printing mechanism of the class described, a font, a frame mounted for pivotal movement with relation to the font, a platen, an inking roll mounted in the frame, an impression element supplied with ink by the inking roll and designed for coaction with the platen, and means yieldably urging the frame in a direction to cause coaction of the said impression element with the said platen.

In testimony whereof I affix my signature.

FRANK R. EVANS. [L. S.]