C. G. RICHARDSON.

MACHINE FOR APPLYING TRANSFER STAMPS TO FABRICS.

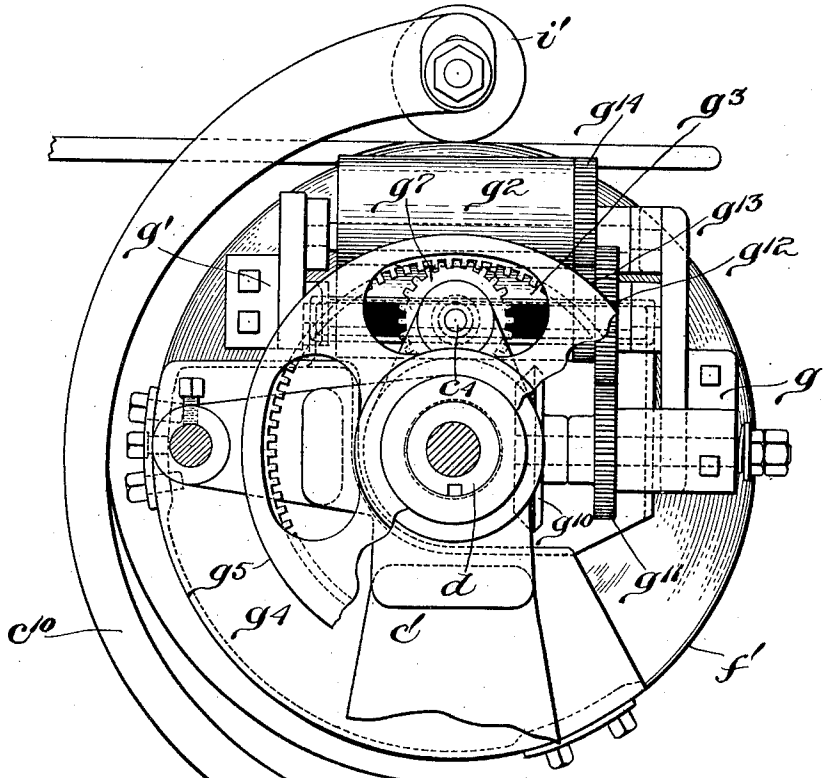
APPLICATION FILED FEB. 10, 1911.

1,086,401.

Patented Feb. 10, 1914.

4 SHEETS—SHEET 1.

Fig. 2.



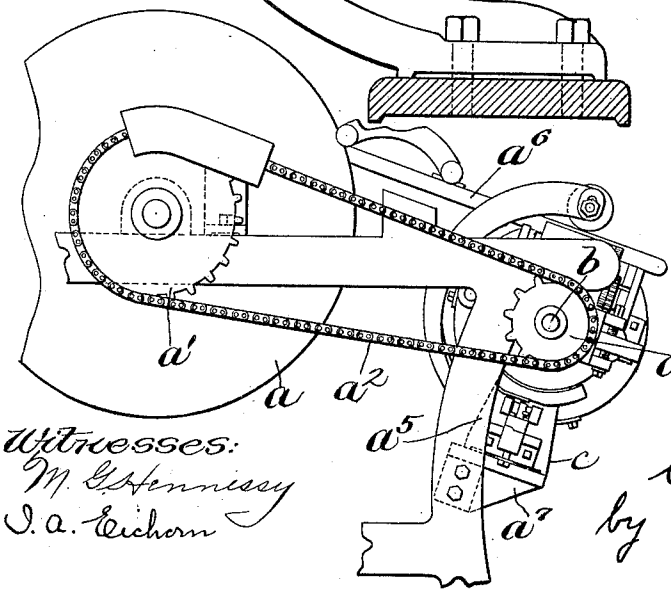


Fig. 1.

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4 SHEETS—SHEET 2.

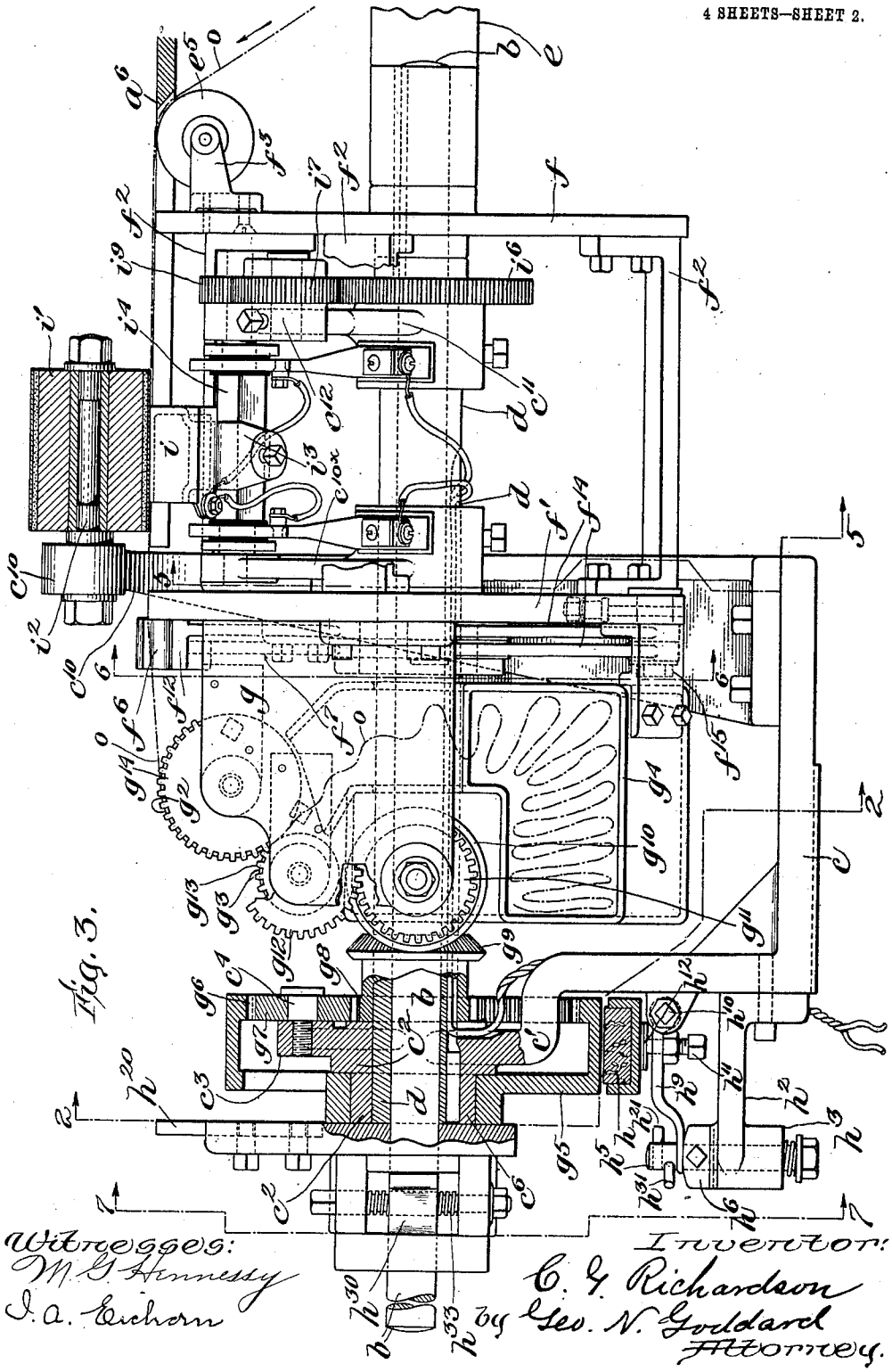


Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 5.

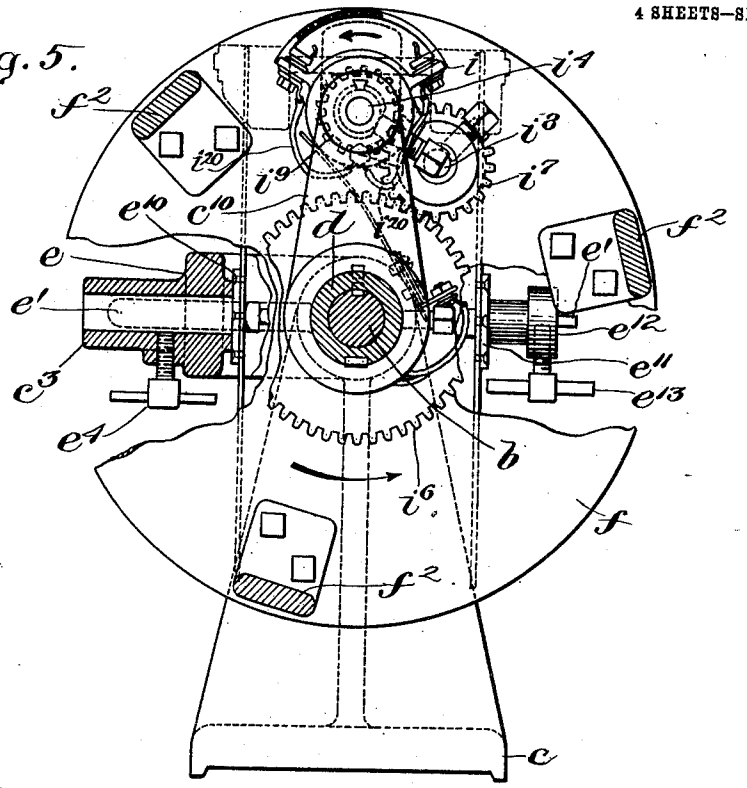
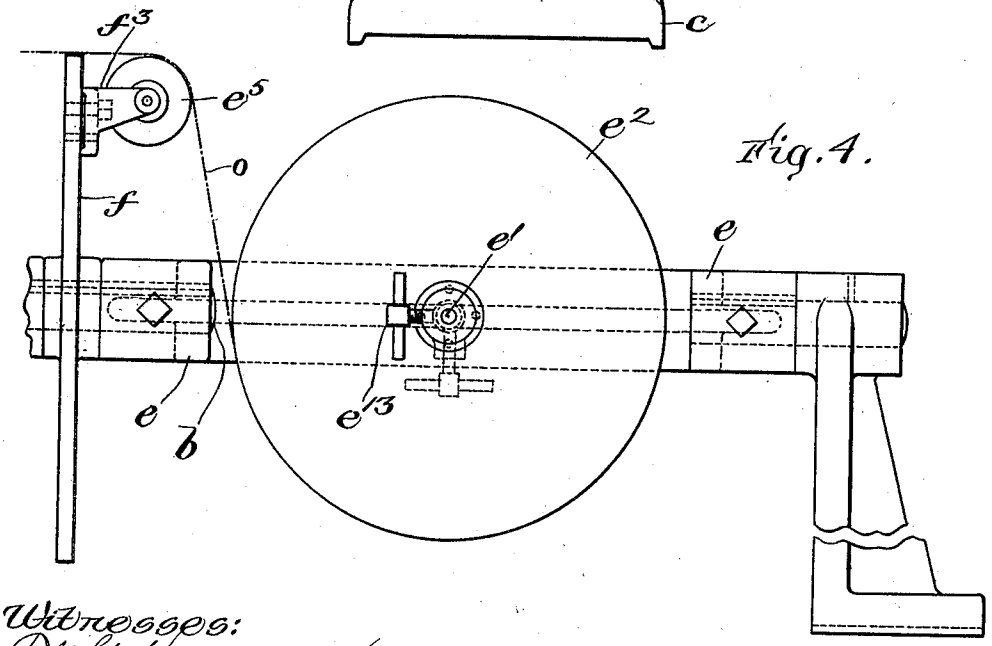


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 7.

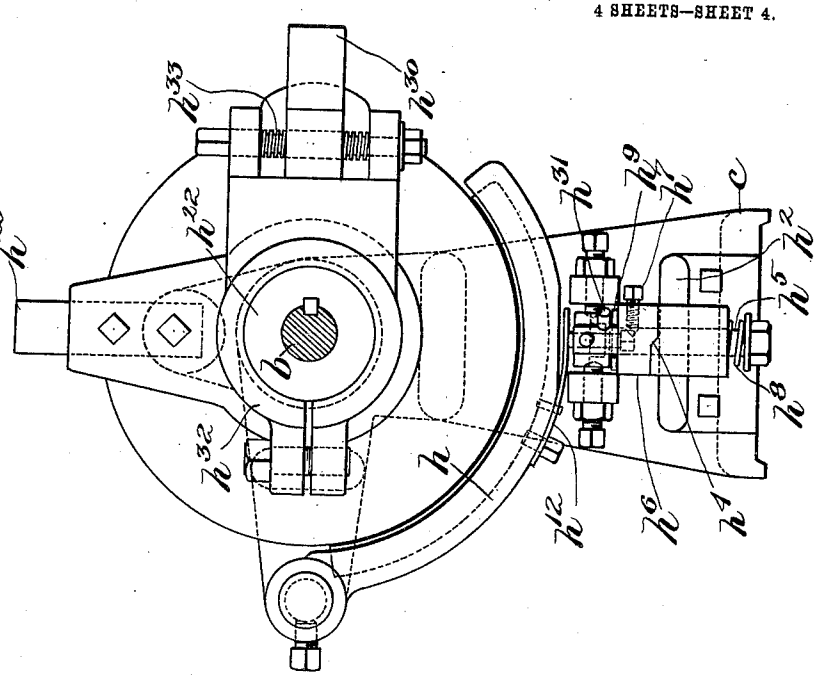
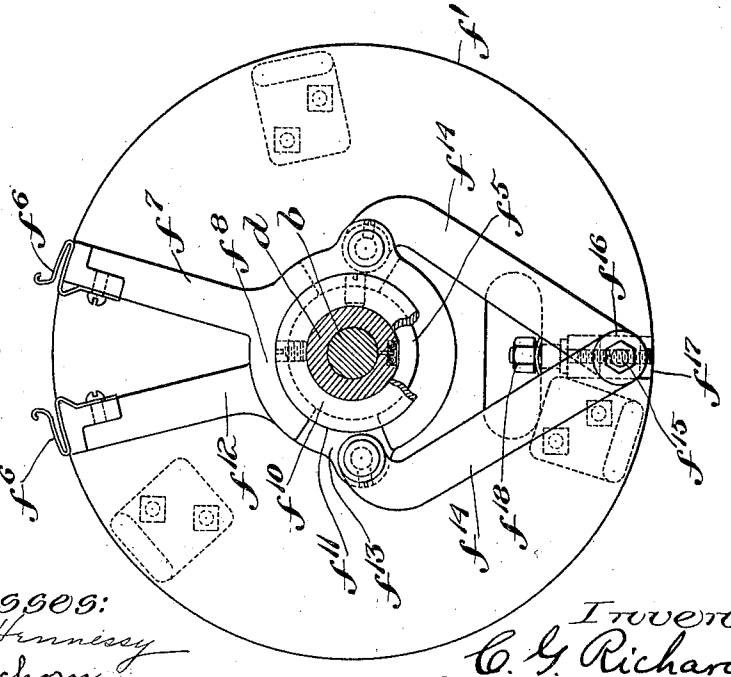


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES G. RICHARDSON, OF SPRINGFIELD, VERMONT.

MACHINE FOR APPLYING TRANSFER-STAMPS TO FABRICS.

1,086,401. Specification of Letters Patent. Patented Feb. 10, 1914.

Application filed February 10, 1911. Serial No. 607,750.

To all whom it may concern:

Be it known that I, CHARLES G. RICHARDSON, citizen of the United States, and resident of Springfield, Vermont, have invented certain new and useful Improvements in Machines for Applying Transfer-Stamps to Fabrics, of which the following is a specification.

This invention has relation to the art of applying so called transfer stamps or decalcomania stamps to various kinds of fabrics and is intended to provide automatic mechanism by which such stamps may be transferred or applied to fabric more expeditiously and with more uniformity than by the present hand methods.

Generally speaking the invention is characterized by a heated presser or transfer member combined with coöperating mechanism which acts to present in proper relationship to each other and to the presser predetermined portions of the fabric or article to be stamped and the stamps which are to be transferred thereto. Generally speaking there will be two coöperating transfer or presser members, one of which should be heated, either or both of said members having movement to press the interposed portion of the fabric and the interposed transfer stamp together when the transfer stamp and the fabric have been brought by other mechanism into proper relationship to the presser.

In the particular form of my invention shown and described herein, a series of transfer stamps are carried on a long continuous strip whose feed is so controlled as to present each successive stamp carried by said strip to those portions of the fabric which it is desired to mark with the stamp.

In the accompanying drawings I have illustrated one of the forms of embodying the principles of my said invention.

Of these Figure 1 is a side elevation showing the cylinder of a cloth measuring machine and the stamp-transfer machine applied thereto in such a way as to apply the stamps to the cloth as it passes through the measuring machine to be measured. Fig. 2 is a transverse section of the planes indicated by broken lines 2—2 on Fig. 3. Fig. 3 is a side elevation partly in section of the complete machine, the revolving yoke which carries the tape being broken away. Fig. 4 is a side elevation of the revolving yoke which carries the tape roll and forms a continuation of Fig. 3, where the same is broken off at the right hand end. Fig. 5 is a transverse vertical section taken on the plane indicated by broken line 5—5 on Fig. 3. Fig. 6 is an end view showing the adjustable tape guides and is taken on the plane indicated by broken line 6—6 on Fig. 3. Fig. 7 is an end elevation partly in section on the plane indicated by broken line 7—7 on Fig. 3.

It will be understood that the specific type of machine illustrated in the accompanying drawings is intended for use in transferring a series of stamps to a piece of cloth or other fabric of considerable length where it is desired to apply the stamps successively at predetermined intervals. This type of transfer machine is adapted to be used on various classes of machines that are used in textile mills and for the purpose of illustration is shown in this case as applied to a cloth machine.

In general the machine may be said to comprise a heated presser or transfer member mechanism for presenting the transfer stamps successively to said presser in position to be transferred to the cloth, the movement of the transfer member, of the cloth and of the stamps being coördinated so that each stamp is presented and impressed upon the cloth at predetermined intervals, as the fabric is fed through the machine.

Referring to Fig. 1, it will be seen that the cloth measuring cylinder a, which in this case may be assumed to have a circumference of two yards, and has on one end of its central shaft a sprocket wheel a' over which passes a sprocket chain a^2 which engages a sprocket wheel a^3 of one half the diameter of the sprocket wheel a' so as to revolve said wheel a^3 twice during one complete revolution of the cloth cylinder a. The sprocket wheel a^3 is secured to the main shaft b of the transfer machine and is the means of causing said shaft to rotate continuously. The stamp transfer mechanism is mounted upon a frame a^5 of the measuring machine immediately below the table a^6 over which the cloth is drawn by the rotating drum a, and is arranged so close to said table that the table is cut away longitudinally or parallel to the axis or shaft to form a slot so as to allow a portion of the mechanism to pass through the table into contact with the cloth which is drawn over said slot in a manner to be hereinafter described. The main or supporting frame work c is

bolted to a bracket a^7 on the frame of a cloth measuring machine, and is provided with an upwardly extended arm or branch c' which is formed with a hollow boss or bearing hub c^2 within which is securely held a stationary bearing sleeve d. This bearing sleeve extends throughout the greater part of the length of this machine and forms a bearing for the main shaft b of the machine. As shown in Figs. 3 and 4 the shaft b projects some distance beyond the right hand end of the sleeve and has applied or otherwise secured to its end a U-shaped yoke e which forms a revolving support in which is firmly clamped a spindle e' intended to support the roll e^2 on which any desired length of transfer tape may be coiled or wound for use. This supporting spindle e' is seated in a socket e^3 formed inside of the yoke e extending at right angles to the axis of said yoke, and is held adjustably therein by means of the set screw e^4.

The transfer carrying tape o is passed over an idler roll e^5 along the line of the slot formed in the table a^6, so as to pass immediately beneath the cloth which is drawn over the table for measurement by the rotating drum a of the measuring machine.

It will be understood that the tape has two different movements, one which is the revolving movement about the axis of the main shaft b which it has in common with the parts which support and feed it, and the other is the intermittent traveling movement in a direction at right angles to the travel of the cloth so that the successive stamps on the tape are brought into relationship beneath the edge of the cloth between the presser members. The object of this arrangement is to cause the tape to travel with the cloth during the short interval that each stamp is in contact with the cloth between the presser members, and also to advance the tape intermittently to present new stamps to new portions of the cloth. The former movement may be termed the revolving movement of the tape, while the latter movement may be termed its feed or travel.

I will first describe the mechanism by which the revolving of the tape and its supporting members around the axis of the shaft b is accomplished to cause the tape at this point of contact with the cloth to move in unison with the cloth through that small arc of contact.

From the roll e^5 as shown in Fig. 3 the tape is passed over the top of a revolving head which comprises two disks f and f' which are rigidly connected together by means of three tie-bars f^2 arranged near their peripheries. The disk f is keyed to the shaft b as shown in Fig. 5 some distance beyond the end of the sleeve d, and on the outer face of this disk f is mounted a bracket f^3 which carries the idler roll e^5 over which the tape travels beneath the table. The other disk f' which forms the coöperating element of the revolving head is centrally perforated to fit over the stationary sleeve d upon which it is free to revolve, the revolving being imparted to it from the shaft b through the medium of the disk f and the tie-bars f^2, the tape is obviously free to travel across the periphery of these two disks at right angles thereto.

In order to guide the tape and keep it in proper position I provide two guide jaws or loops f^6 by which the opposite edges of the tape are held in position. As different widths of tape may be used, provision is made for adjusting these guide jaws f^6 with relation to each other. I therefore mount one guide jaw f^6 upon the arm f^7 which projects from a central ring or hub f^8 which nearly surrounds the sleeve d and which is mounted upon a fixed bushing f^{10} which surrounds said sleeve d and is secured thereto by set screw as shown in Fig. 6. This bearing hub or bushing is provided with an outwardly projecting annular flange f^{11} to prevent the ring or hub f^8 from slipping longitudinally of the sleeve. The other guide f^6 is secured to a similar arm f^{12} projecting from a circular ring or hub f^{13} similarly mounted on the said stationary bearing hub or bushing f^{10} between the hub f^8 and the disk f'. Each of these arms f^7 and f^{12} therefore are capable of rotation about their bearing hub f^{10} to bring them nearer together or farther apart. In order to adjust the jaws f^6 to the width of the tape a convenient adjusting means is provided in the form of links f^{14} engaging the respective rings f^8 and f^{13}, said links being connected to a common pivot pin f^{15} carried by a sliding block f^{16} which is adjustable in a radial way or groove f^{17} formed in the disk f' by means of a screw bolt f^{18}, the turning of which causes the travel nut f^{16} to move toward or away from the center, thereby moving the jaws f^6 farther apart or nearer together.

As the roll carrying yoke e and the disks f and f' which support the tape in its travel revolve in unison, the tape is advanced bodily in the direction that the cloth moves directly under the cloth by the revolving movement about the axis of the shaft b, but as previously explained it is desired to feed the tape intermittently forward to bring the successive stamps into contact with the cloth between the presser members, and I will now describe the mechanism by which the tape is unwound and fed across the line of travel of the cloth.

On the face of the disk f' as shown in Fig. 2 are bolted two brackets g and g' which form the support for the intermittently acting feed rolls g^2 and g^3 between

which the tape is passed and by which it is turned forward when said rolls g^2 and g^3 rotate. The waste or used portion of the tape passes from the nip of said rolls into a hollow box or casing g^4 carried by the revolving disk f'.

The intermittent feeding or rotation of the rolls g^2 and g^3 is accomplished in a manner now to be described. A hollow ring g^5 having an internal gear g^6 is mounted so as to be free to rotate on a hub c^2 formed on a vertical arm c' of the frame c. The arm c' is provided with an upward extension c^3 which carries a stud c^4 on which is mounted a loose transmission gear g^7 which at its outer side meshes with the internal gear ring g^6 and on its lower side meshes with a gear g^8 which is compounded with a bevel gear g^9. This bevel gear g^9 is mounted to rotate on the fixed sleeve d and intermeshes with a bevel gear g^{10} which is compounded with a spur gear g^{11} meshing with a spur gear g^{12} on a shaft of the feed roll g^3. On this feed roll is a similar spur gear g^{13} which meshes with a spur gear g^{14} secured to the shaft of the feed roll g^2. Inasmuch as the train of gearing g^{10} to g^{14} is carried by the brackets g which are secured to the rotating disk f', it is obvious that the whole train of gears revolve about the axes of the main shaft b, while each spur has a rotation about its own axes.

The rotation of the train of gearing which drives the feed rolls is accomplished in the following manner: Obviously if the hollow gear g^5 and g^6 is held against rotation it will act through the medium of the transmission gear g^7 to lock the compound gears g^8 and g^9 against rotation. Inasmuch as the train of gearing beginning with bevel gear g^{10} is continuously revolving around the shaft b and is always in engagement with the beveled gear g^9 it will be seen that the anchoring or holding of gear g^9 must result in imparting a rotation of the gear g^{10} about its own axis quite distinct from its revolving movement around the main shaft of the machine. This rotating movement is transmitted to the feed rolls so as to cause their rotation to turn forward or feed the tape across the line of travel with the cloth in the direction of the longitudinal slot formed in the table a^6. It will also be seen that if the hollow gear g^5 and g^6 be released so as to be free to rotate on its bearing, the effect of the revolving movement of bevel gear g^{10} meshing with gear g^9 is to cause gear g^9 to rotate in unison with the revolving movement of gear g^{10}, so that there will be no rotation of the gears g^{10} and g^{11} about their axes, since such rotation is only produced by the revolving movement, while the gear g^9 is held against rotation. So long as the gear g^9 is held against rotation the feed rolls will be rotated to cause the stamp tape to travel, while the release of said gear g^9 results in a cessation of the feeding of the tape. The stopping and releasing of this gear g^9 is accomplished by means of a pivoted brake arm h which is automatically moved into and out of gripping engagement with the periphery of the gear g^5.

The brake actuating mechanism is best shown in Figs. 3 and 7 and will now be described.

To the end of the frame portion c is secured a bracket h^2 carrying a cylindrical boss h^3 which is centrally bored and whose upper face is formed with a cam like shoulder h^4. Through this boss is passed a vertical rock shaft h^5 whose upper end projects some distance above the cam face of the boss h^3. To this shaft is secured a cam like member h^6 by means of a set screw h^7 so that the rotation of the shaft h^5 in one direction tends to lift the shaft h^5, while the rotation in the reverse direction permits the shaft to drop down under the influence of the spring h^8. Upon the top of the cam member h^6 rests the free forked end of a lever h^9 which is pivoted to the frame by the adjustable pivot screw h^{10}. This arm h^9 carries an adjustable bolt h^{11} whose upper end normally presses against a stiff spring h^{12} secured to the bottom of the brake arm h in order to lift the said brake shoe yieldingly against the gear g^5. The rotation or rocking of the rock shaft h^5 is accomplished by two arms h^{20} and h^{30} which revolve with the shaft b. The arm h^{20} is keyed to the shaft b and lies in a plane to engage a lateral projection h^{21}, formed on the rock shaft h^5 to cause the rotation of the rock shaft in a clockwise direction. The arm h^{20} is provided with a hub h^{22} upon which is firmly clamped a split hub h^{32} whereby the holding portion of the arm h^{30} may be clamped securely to the arm h^{20} when adjusted in the desired relationship thereto. The arm h^{30} is adjustable in its split hub or holder by means of the adjusting screw h^{33}, the turning of which causes the arm h^{30} to be advanced or retracted in its circumferential relationship to the arm h^{20}. The arm h^{30} in its revolution engages the pin or projection h^{31} on the opposite side of the shaft h^5 to the location of pin h^{21}, so that when the arm h^{30} in its revolution strikes or engages pin h^{31} the shaft is partially rotated in a contra-clockwise direction.

In Fig. 7 the parts are shown with the brake released and the feed rolls idle or inactive, the tape being at rest so far as its feed or forward travel is concerned. With the continued rotation of the shaft b and the arm h^{20} in a contra-clockwise direction, the rock shaft h^5 will be turned by the arm h^{20} striking against the pin h^{21}, so as to cause the cam member h^6 to rotate upon the

shoulder h^4 in order to lift the rock shaft and consequently the lever h^9. This raising of the lever h^9 acts through the engagement of the adjustable screw h^{11} and the spring h^{12} to press the brake arm h into frictional engagement with the periphery of the gear g^5, so as to hold said gear against rotation thereby causing the train of gears which drive the feed roll to rotate in order to feed a fresh portion of the tape bearing an unused stamp into proper position to be affixed to the cloth.

I will now describe the transfer or stamp applying mechanism. This comprises an electrically heated presser plate i, which is made in the shape of a segment of a cylinder practically concentric with the axes about which said heated plate is rotated, and is supplied with a heating current from the conductors i^{20}. Coöperating with the heated presser or transfer plate i is a revolving roll i' which is mounted to revolve upon a shaft or stud i^2 carried by an upward extension c^{10} which is rigidly secured to the frame c, and which extends up beyond the side edge of the table a^6, so that the roll may be supported directly above the slot formed in said table. The function of this member or roll i is to hold the underlying portion of the cloth to be marked against the pressure of the heated plate i. The heated plate i is mounted on a bracket or frame i^3 which is clamped to a rotary shaft i^4, one end of which is mounted in an arm c^{10x} fixed to sleeve d and the other end being mounted in bearings formed in an enlarged boss c^{12} formed on an arm c^{11}, which arm is also secured rigidly to the fixed sleeve d. The rotation of this shaft i^4 is accomplished by means of a gear i^6 secured to the shaft b, and meshing with an intermediate gear i^7, which is pivoted on a stud i^8 carried by the boss c^{12} and which gear i^7 meshes with a gear i^9 secured to the projecting end of the shaft i^4, as shown in Figs. 3 and 5. In this instance the gearing train which drives the shaft i^4 is arranged so that the peripheral speed of the presser i is substantially equal to the peripheral speed of the disks f and f' in order that the movement of the presser may correspond to the revolving movement of the tape in contact with the cloth. Consequently as the hot presser plate i swings up into contact with the tape both the tape and the presser travel together with the cloth across the open slot in the table during the brief interval in which they are in contact for the purpose of transferring the stamp from the tape to the cloth.

The roll of tape is loosely mounted on the holding spindle e' between two clamping disks e^{10} and e^{11} which are free to turn on said spindle. The clamping disk e^{11} is provided with a hub e^{12} in which is mounted a binding screw e^{13} which can be turned in to engage the end of the spindle, so as to produce a frictional engagement between the hub or stationary spindle upon which the hub revolves. This frictional engagement tends to make the roll of tape turn a little hard on the spindle according to the degree of friction and therefore holds back or retards the rotation sufficiently to keep the stamp-carrying tape taut at all times.

What I claim is:

1. In a stamp transfer machine the combination of a support for a moving web of cloth, means for automatically feeding the individual stamps of a series into contact with different portions of said cloth transversely to the direction of its travel, and heated means for pressing said transfer stamp against the cloth while the cloth and stamp are in contact, substantially as described.

2. In a stamp transfer machine the combination of cloth feeding means, a heated presser movable with said cloth when in contact therewith, and means for feeding a series of transfer stamps successively between the traveling cloth and the presser transversely to their line of movement, substantially as described.

3. The combination of the presser members one of which is heated and movable to intermittently press against the other, means for continuously feeding a web of fabric between said presser members, a stamp carrying tape and means for intermittently feeding said tape between said presser members across the line of travel of the fabric and means for moving said tape bodily in the direction of the movement of the fabric while it is in contact with said fabric, substantially as described.

4. In a stamp transferring machine the combination with a cloth support of a revolving head, a stamp carrying tape arranged to travel axially of said head, presser members between which the tape is carried adjacent to the cloth support, means for revolving said head and means for feeding said tape to bring additional stamps successively into proper position adjacent to the cloth support, substantially as described.

5. In a stamp carrying machine the combination with presser mechanism, a cloth support for guiding the cloth between the elements of said presser mechanism, a revolving head, a roll support carried by said revolving head to support a roll of tape, feeding mechanism carried by said revolving head for intermittently feeding the tape forward between said presser members, substantially as described.

6. In a stamp transfer machine the combination of a revolving head for supporting a roll of stamp carrying tape, feed rollers carried by said revolving head, guiding devices for positioning the tape on the revolv-

ing head, and means for intermittently operating the feed rolls at each revolution of the revolving head, substantially as described.

7. In a stamp transfer machine the combination of the revolving heated presser, a coöperating presser roll, a cloth support arranged to guide the cloth between said presser and presser roll, a revolving head for supporting a stamp carrying tape to bring said tape intermittently between the presser members in order that it may be pressed against the cloth while traveling in the direction of the cloth, and means for intermittently feeding said tape forward to bring new stamps into operative position in relation to the presser mechanism, substantially as described.

8. The combination with cloth feeding mechanism revolving presser members between which the cloth is passed, one of said presser members being heated, a support for carrying and guiding a stamp carrying tape, means for revolving said support in order to pass the tape at predetermined intervals between the presser members in contact with the cloth, and means for feeding the tape intermittently and across the line of travel of the cloth to bring successive stamps into operative relationship to the presser mechanism in order to transfer the stamp to the cloth by pressure, substantially as described.

9. In a stamp transfer machine the combination with the presser or transfer mechanism embracing a heated element, a tape support for carrying the stamp transfer tape successively into contact with the cloth to be stamped between the presser elements, and means for intermittently moving the tape forward step by step to bring new portions thereon into contact with the cloth at each revolution, substantially as described.

10. The combination with the cloth support of a pair of coöperating presser members, a revolving shaft, a tape support carried by and revolving with said shaft to bring the stamp carrying tape between the presser members in contact with the cloth at each revolution of the shaft, tape feeding mechanism for imparting a step by step motion to the tape, mechanism actuated by the revolution of the shaft, to render the tape feeding mechanism inoperative when the tape is in contact with the cloth and to render it operative at a predetermined point in the revolution of the tape, substantially as described.

11. The combination with the revolving head, a tape roll supporting bracket revolving therewith, a heated presser intermittently movable into contact with the tape to press against the cloth to be stamped, a loose gear having operative engagement with the tape feeding mechanism in order to actuate the same when said gear is held against movement, a main shaft and means actuated by the rotation of the main shaft to alternatively grip and release said loose gear at predetermined intervals in the rotation of the shaft in order to intermittently actuate the tape feeding mechanism, substantially as described.

12. The combination of the main driving shaft, revolving presser members which intermittently press against each other with their opposed faces moving in the direction of the travel of the cloth to be stamped, a cloth support arranged adjacent to said presser members to permit the cloth to pass between them, a feed mechanism for intermittently drawing forward a stamp carrying tape between the presser members and in contact with the cloth, the presser actuating mechanism and the tape feeding mechanism being driven by suitable connections from the main shaft, a device for starting and arresting the operation of the intermittent tape feeding mechanism, and arms revolving with the main shaft to engage said starting and stopping mechanism at predetermined intervals in order to control the feed of the stamp tape, substantially as described.

In witness whereof, I have subscribed the above specification.

CHARLES G. RICHARDSON.

In the presence of—

ANNIE BEATRICE BURKE,

BLANCHE L. NORTON.

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