No. 743,038. PATENTED NOV. 3, 1903.

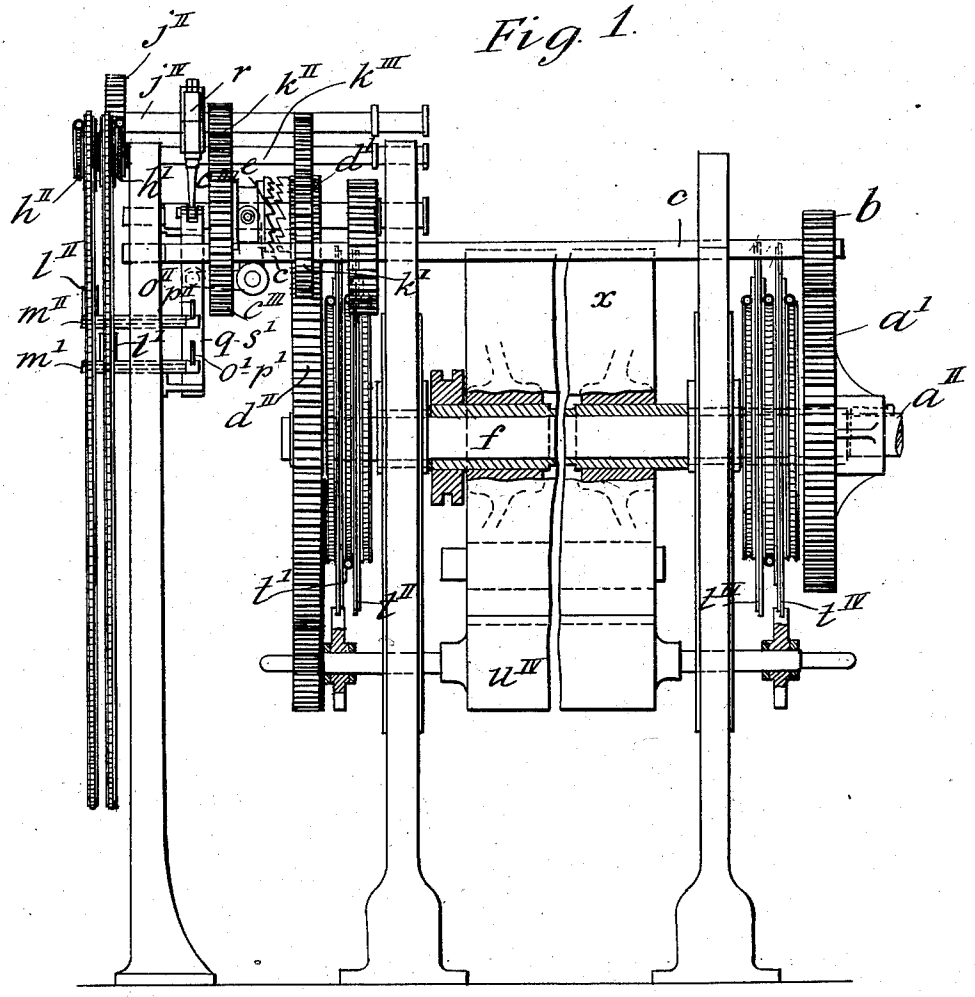
J. G. SANDERSON.

FABRIC PRINTING MACHINE.

APPLICATION FILED DEC. 23, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Dennis Sumby.
[illegible]

Inventor
John G. Sanderson
By
James L. Norris.
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 743,038. PATENTED NOV. 3, 1903.

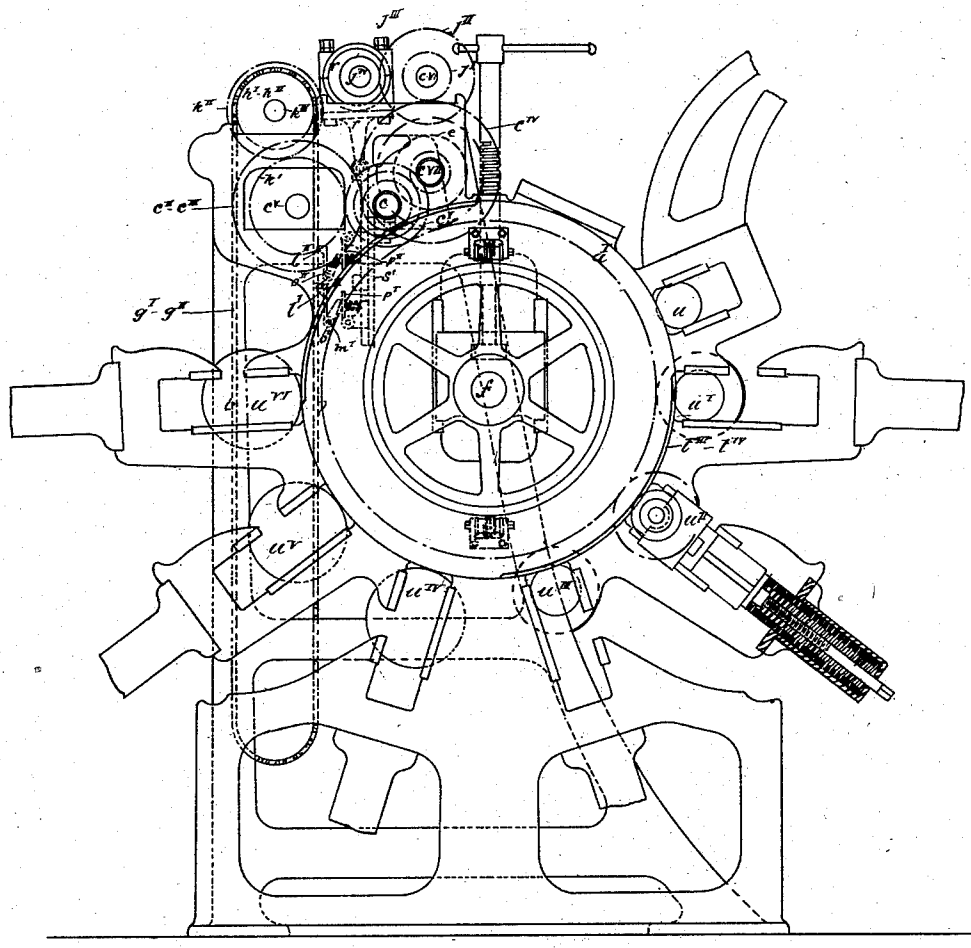
J. G. SANDERSON.

FABRIC PRINTING MACHINE.

APPLICATION FILED DEC. 23, 1902.

NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Dennie Lumby.

Inventor
John G. Sanderson
By
James L. Norris.
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 743,038. PATENTED NOV. 3, 1903.

J. G. SANDERSON.

FABRIC PRINTING MACHINE.

APPLICATION FILED DEC. 23, 1902.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.

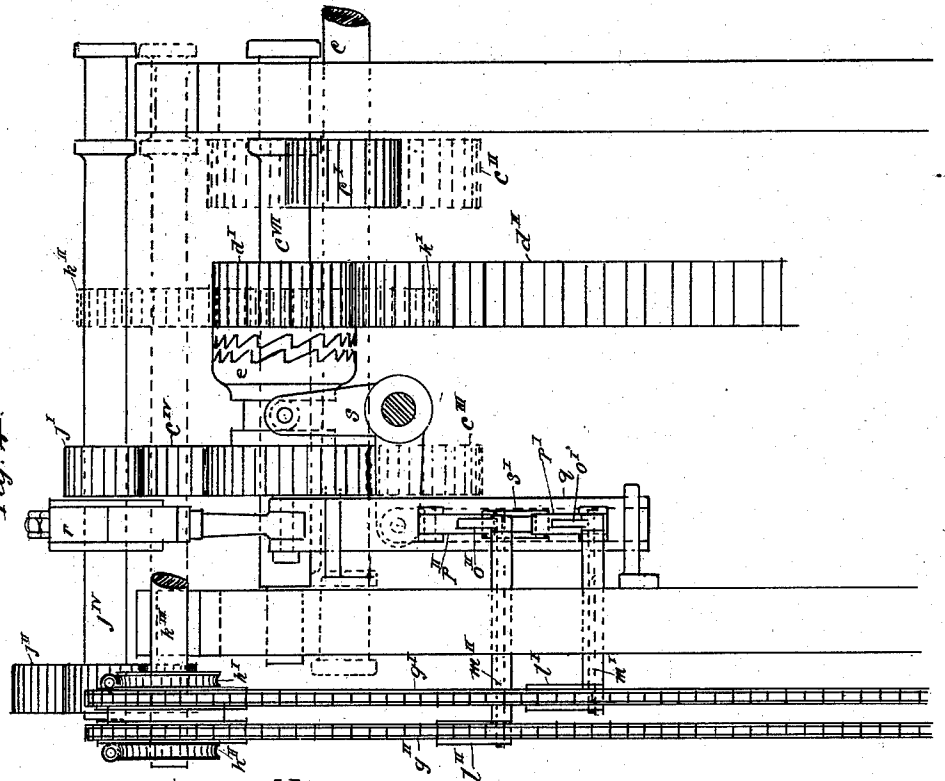
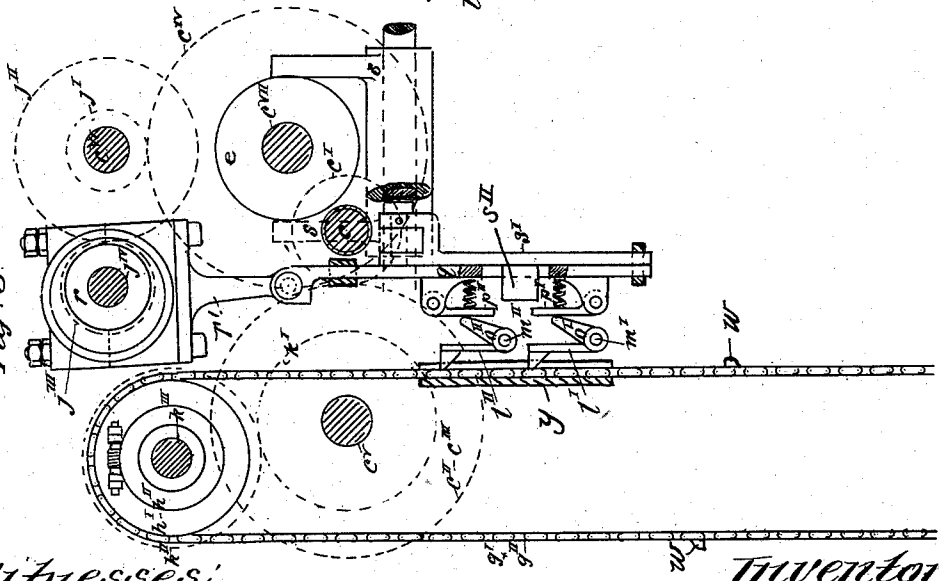


Fig. 5.



Witnesses:
Dennis Sumby.
J. C. Kelly

Inventor
John G. Sanderson
By James L. Norris.
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 743,038. Patented November 3, 1903.

UNITED STATES PATENT OFFICE.

JOHN GLASGOW SANDERSON, OF MANCHESTER, ENGLAND, ASSIGNOR TO MATHER & PLATT, LIMITED, OF MANCHESTER, ENGLAND.

FABRIC-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 743,038, dated November 3, 1903.

Application filed December 23, 1902. Serial No. 136,399. (No model.)

To all whom it may concern:

Be it known that I, JOHN GLASGOW SANDERSON, engineer, a citizen of England, residing at Salford Iron Works, Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Fabric-Printing Machines, (for which I have applied for a patent in Great Britain, No. 12,074, dated May 27, 1902,) of which the following is a specification.

This invention relates to machines for printing fabrics of the kind in which the printing-rollers are forced into and out of contact with the fabric at predetermined intervals while the fabric is being printed. For this purpose endless revolving chains are employed, these having suitable projections fixed at the required distances apart, so as to act as the measuring apparatus for regulating the intervals of contact of the printing-rollers. The chains can be lengthened or shortened, so as to obtain a great number of diversity of intervals or contact. As the chains travel the projections on them through suitable mechanism actuate an arrangement for throwing a clutch in and out of gear. When the clutch is thrown in gear, motion is given to cams having projections that force the printing-rollers out of contact with the fabric and having depressions which allow the rollers to be forced back into contact with the fabric by weights or springs or the like. Preferably the cam-shaft passes through a tubular shaft carrying the main bowl of the printing-machine, which shaft revolves in suitable bearings in the side frames.

In the accompanying drawings, Figure 1 is an end elevation of a fabric-printing machine having my improvements, while Fig. 2 is a side elevation thereof, partly in section. Fig. 3 is a side elevation, and Fig. 4 an end elevation, of the measuring apparatus.

Like letters denote like parts in the several views.

It will be seen from Fig. 2 that this machine has seven auxiliary rollers, or "nips," as they are called; but these form no part of the invention and are here shown actuated by spiral springs; but the usual weights or levers will suffice. The five nips $u^{I}\,u^{II}\,u^{III}\,u^{IV}\,u^{V}$ are arranged for printing. The first nip u is used as a drag-roller and the seventh nip u^{VI} as a driving-roller to insure constant and steady rotation of the printing-machine bowl.

The main driving-shaft of the machine a^{II} is journaled outside of the machine and is driven by any suitable power. (Not shown.)

The gear-wheel a^{I} is keyed to the shaft a^{II} and has a long boss, a portion of which has a brass bushing in which is supported the end of the cam-shaft f, which revolves in the hollow shaft of the printing-machine bowl x, supported in suitable bearings in the frame of the machine. The shaft f extends through the machine and is keyed at its opposite end to the gear-wheel d^{II}, as hereinafter referred to. The printing-machine bowl x is driven by friction of the printing-rollers or nips u^{I}, u^{II}, u^{III}, u^{IV}, and u^{V}, and of the roller u^{VI}. The gear-wheel a^{I} drives the printing-rollers u^{I}, u^{II}, and u^{III}, the roller u^{VI}, and the wheel b. The latter is keyed to the shaft c, which drives one member of the clutch e through the gears $c^{I}\,c^{II}\,c^{III}\,c^{IV}$. The other member drives the cam-shaft f through the gear $d^{I}\,d^{II}$. The gear-wheel d^{II} also drives the rollers u^{IV} and u^{V}.

The clutch e is engaged and disengaged by movement of the lever s, which is operated by the vibrating frame and the measuring device. The latter comprises two chains $g^{I}\,g^{II}$, traveling on adjustable chain-wheels $h^{I}\,h^{II}$, respectively, on shaft k^{III}, which are driven from shaft c^{V} by gear $k^{I}\,k^{II}$. These chains hang freely at their lower ends and carry suitable tappets w at distances apart corresponding with the required distance between the impressions of the printing-rollers. The tappets w engage with lever-arms $l^{I}\,l^{II}$ on shafts $m^{I}\,m^{II}$, respectively. Journaled supports or guides y are provided at that point where the tappets w encounter the lever-arms l^{I} and l^{II} to hold the tappets up against the lever-arms. The latter have lever-arms $o^{I}\,o^{II}$ for depressing the levers $p^{I}\,p^{II}$, respectively, and thereby tripping the vibrating frame q, as hereinafter described.

The frame q consists of a flat bar connected at its upper end to the pitman r^{I} of the eccentric r and is adapted to reciprocate in two guideways. Near the center of the frame q is a slot through which projects the lug s^{II} of the link s^{I}, which is slidingly mounted

behind the frame q and is provided at its upper end with a slot in which is seated the lower arm of a bell-crank s. The other end of the bell-crank s has a pin connected thereto which rides in a peripheral groove in the journal of one member of the clutch e.

Upon the outer face of the vibrating frame q are projections, one above and one below the slot, upon which are journaled the levers p^{I} and p^{II}. The levers p^{I} and p^{II} are normally held in the position shown in Fig. 3 by means of spiral springs. The lever p^{I} has its outer arm extending upwardly from its bearing and the lever p^{II} has its outer arm projecting downwardly from its bearing.

The vibrating frame q is reciprocated in two guideways in front of the link s^{I} by means of the pitman r^{I} of the eccentric r, keyed on the shaft j^{IV}, which is driven from the shaft c^{VII}, through the gears c^{IV}, j^{I}, j^{II}, and j^{III}.

When a tappet on the chain g^{I} encounters the lever l^{I}, the arm o^{I} depresses the lever p^{I} against the force of the spiral spring behind it, and on the upward stroke of the frame q the depressed lever p^{I} engages with the lug s^{II}, which projects from the link s^{I} through the slot in the frame q. The link s^{I} is therefore forced upward, and through the bell-crank s, to which it is connected, the clutch e is thrown into gear. Similarly, on the downward stroke of the frame q the lever p^{II}, which is depressed as the tappet passes under the end of the lever l^{II}, encounters the lug s^{II} and throws the clutch out of gear. When the clutch e is in gear, the cam-shaft f is set in motion through the gear d^{I} d^{II} and the cams t^{I} t^{II} t^{III} t^{IV} come into operation. In the machine here shown, designed for printing shawls or the like, one pair of the cams forces the body-printing rollers out of contact and the other pair brings the cross-border-printing rollers into contact with the fabric being printed. When the cross-border is completed, the same pair of cams forces this pair of rollers out of contact, the other pair of cams bring the body-printing rollers into operation, and the lever p^{II} operates the bell-crank lever s to disengage the clutch e, thus bringing the cams to rest, while the body-rollers continue their printing until the next tappet causes the engagement of the clutch e.

It will be seen that for variation of the intervals of contact of the rollers it is only necessary to change the length of chains or the distance between the tappets thereon.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

1. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating said cam-shaft and driven by the other member of said clutch, printing devices, mechanisms operated by the cam-shaft for intermittently throwing the printing devices out of operation, and means actuated by the prime mover for throwing the two clutch members into and out of engagement at predetermined intervals for the purpose specified.

2. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating said cam-shaft and driven by the other member of said clutch, printing devices, mechanisms operated by the cam-shaft for intermittently throwing the printing devices out of operation, lever mechanisms for throwing the two clutch members into engagement, and means actuated by the prime mover for operating said lever mechanisms at predetermined intervals for the purpose specified.

3. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating said cam-shaft and driven by the other member of said clutch, printing devices, mechanisms operated by the cam-shaft for intermittently throwing the printing devices out of operation, a bell-crank lever adapted when operated to throw the clutch members into engagement, and means actuated by the prime mover for operating said bell-crank lever at predetermined intervals for the purpose specified.

4. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating the cam-shaft and driven by the other member of said clutch, printing devices and mechanisms operated by the cam-shaft for intermittently throwing the printing devices out of operation, a vibrating frame actuated by the prime mover, means coöperating with said vibrating frame, adapted when operated to throw the clutch members into and out of engagement, and means actuated by the prime mover for operating said coöperating means at predetermined intervals for the purpose specified.

5. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating the cam-shaft and driven by the other member of said clutch, printing devices and mechanisms operated by the cam-shaft for intermittently throwing the printing devices out of operation, a bell-crank lever adapted when operated to move the clutch members into and out of engagement, a vibrating frame, a link for operating said bell-crank lever, mechanisms carried by said vibrating frame for operating said link, and means for operating said latter mechanisms at predetermined intervals for the purpose specified.

6. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating the cam-shaft and driven by the other member of said clutch, printing devices and mechanisms op-

erated by the cam-shaft for intermittently throwing the printing devices out of operation, a bell-crank lever adapted when operated to move the clutch members into and out of engagement, a vibrating frame, a link for operating said bell-crank lever, mechanisms carried by said vibrating frame for operating said link, and traveling chains actuated by the prime mover for operating said latter mechanisms at predetermined intervals for the purpose specified.

7. A machine for printing fabrics, comprising a two-membered clutch, one of the members of which is connected with a prime mover, a cam-shaft, gearing for operating the cam-shaft and driven by the other member of said clutch, printing devices and mechanisms operated by the cam-shaft for intermittently throwing the printing devices out of operation, a bell-crank lever adapted when operated to move the clutch members into and out of engagement, a vibrating frame, lever mechanisms carried thereby, a link having one of its ends engaging with the bell-crank lever and further provided with means adapted to be engaged by the lever mechanisms carried by said vibrating frame and thereby operate said bell-crank lever, levers for operating the levers carried by the vibrating frame, and means actuated by the prime mover and adapted to operate said latter levers at predetermined intervals for the purpose specified.

8. A machine for printing fabrics, comprising a two-membered clutch having one of its members connected with a prime mover, a cam-shaft, a gearing for operating said cam-shaft and carrying the other member of said clutch, lever mechanisms for moving said clutch into and out of operative position, moving chains suitably supported by the frame of the machine, tappets carried by said chains and adapted to engage with and operate said lever mechanisms and printing machinery operatively connected with said mechanisms.

9. A machine for printing fabrics, comprising a printing-bowl having a hollow shaft, a cam-shaft passing through said hollow shaft, printing-rollers, cams on said cam-shaft for moving the printing-rollers out of printing relation with the printing-bowl, gearing for driving said cam-shaft, a clutch for connecting said gearing to a prime mover, lever mechanisms for moving said clutch into and out of operative position, and means actuated by the prime mover for operating said lever mechanisms at predetermined intervals for the purpose specified.

10. A machine for printing fabrics, comprising a two-membered rotatable clutch having one of its members suitably connected with a prime mover, a cam-shaft, a gearing for operating said cam-shaft and carrying the other member of said clutch, a vibrating frame, means carried by said vibrating frame adapted when operated to move the members of said clutch into and out of operative position, traveling chains suitably supported by the frame of the machine and adapted to engage with and operate said lever mechanisms, and printing devices connected with and cooperating with said cam-shaft.

11. A machine for printing fabrics, comprising a printing-bowl having a hollow shaft, a cam-shaft passing through said hollow shaft, printing-rollers, cams on said cam-shaft for moving the printing-rollers out of printing relation with said printing-bowl, gearing for driving said cam-shaft, a clutch for connecting said gearing to a source of power, a bell-crank lever adapted when operated to move said clutch into and out of operative position, a vibrating frame, a link for operating said bell-crank lever, lever mechanisms carried by said vibrating frame for operating said link and traveling chains suitably supported by the frame of the machine and adapted to engage with and operate said lever mechanisms.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN GLASGOW SANDERSON.

Witnesses:
JOHN FITZPATRICK,
GEORGE PALGRAVE SIMPSON.