

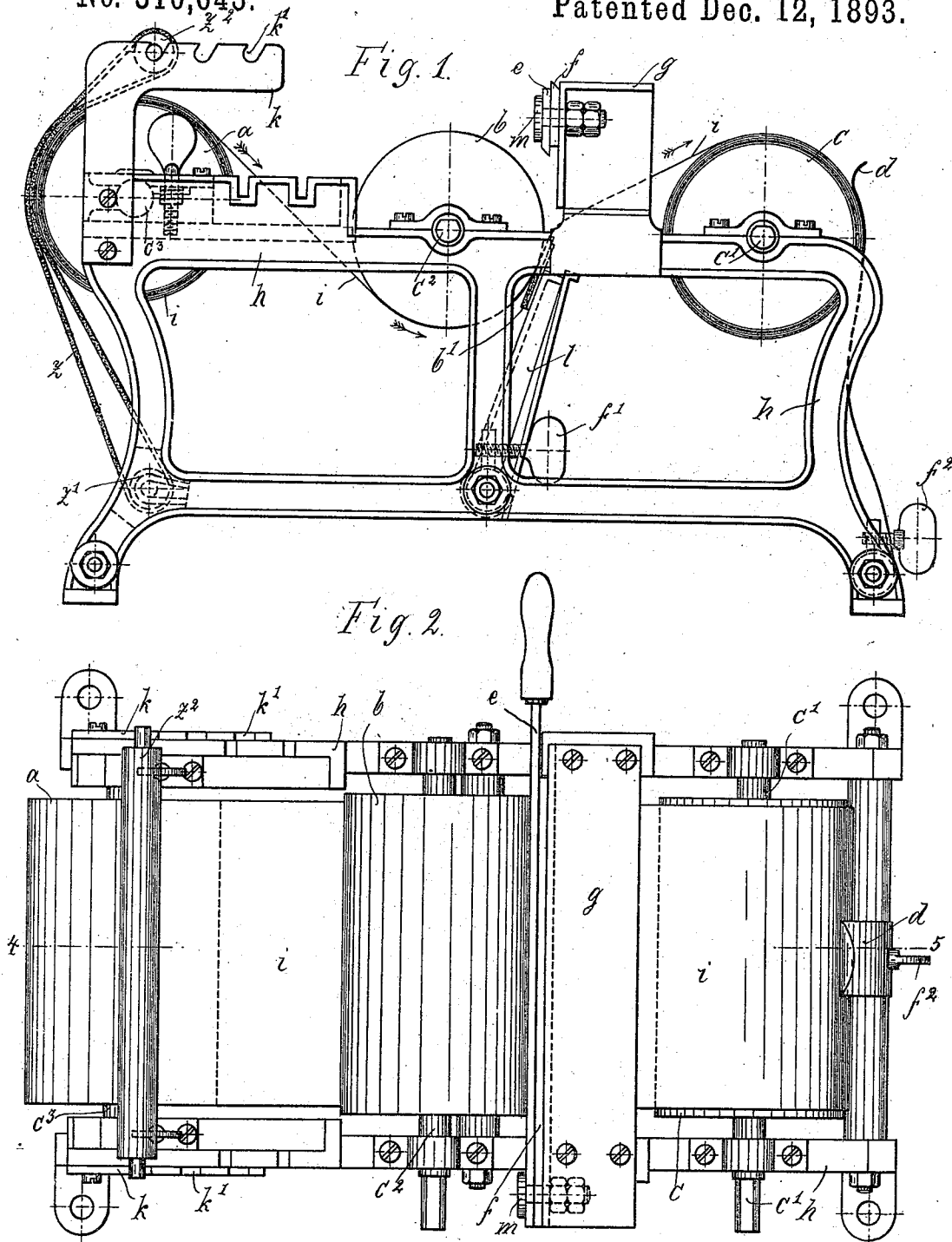
(No Model.)

2 Sheets—Sheet 1.

H. HURWITZ & A. SCHAPIRO.
ROLLER COPYING MACHINE.

No. 510,643.

Patented Dec. 12, 1893.



Witnesses:
H. Walther
Carl Pfaffbach

Inventors:
Hermann Hurwitz
and Asik Schapiro
by
Robert Aduln
Attorney.

(No Model.)

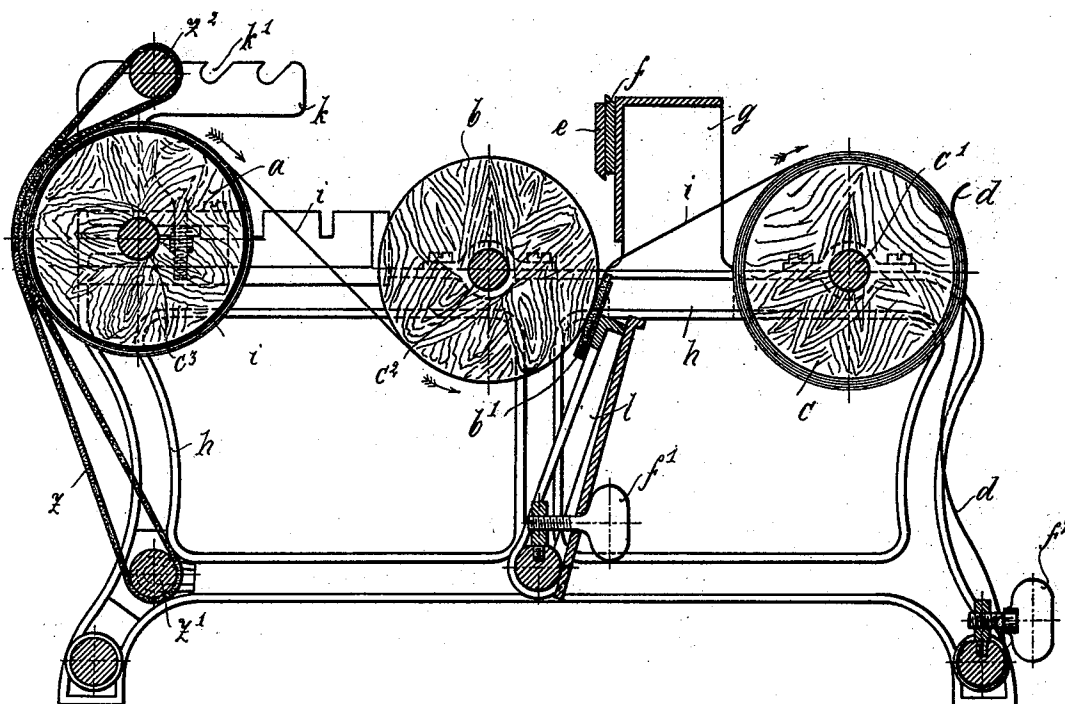
2 Sheets—Sheet 2.

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Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

HERMANN HURWITZ AND AISIK SCHAPIRO, OF BERLIN, GERMANY.

ROLLER COPYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,643, dated December 12, 1893.

Application filed August 9, 1893. Serial No. 482,772. (No model.)

To all whom it may concern:

Be it known that we, HERMANN HURWITZ, manufacturer, a subject of the King of Prussia, German Emperor, and AISIK SCHAPIRO, manufacturer, a subject of the Emperor of Russia, residing at Berlin, in the Province of Brandenburg, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Roller Copying-Machines, of which the following is a specification.

Our invention relates to an apparatus for producing a greater number of copies from one original letter or other writing or document, and our improvements in such apparatus relate to an arrangement of rollers and combination of parts, by aid of which we are enabled to produce such copies continuously instead of intermittently, as has been the case heretofore.

In order to make our invention more clear, we refer to the accompanying drawings, in which similar letters denote similar parts, and in which—

Figure 1 is a side-view of our improved apparatus; Fig. 2 an upper view of the same; and Fig. 3 a vertical longitudinal section, taken on the line 4—5, Fig. 2.

The frame *h* of the apparatus carries the three rollers *a*, *b* and *c*, which are supported by the axles *c*¹, *c*² and *c*³. The fresh copying-paper *i* is wound upon the delivery-roller *a*, and is led from this latter over the under part of the copying-roller *b* to the receiving-roller *c*. The paper on roller *a* is kept through several layers, in a moist state by an endless damping-band *z*, which is led over, and held by, the small rollers *z*¹ and *z*². The latter is supported by the brackets *k*, in the upper rim of which are provided the cuts *k*¹, in order to allow an alteration in the place of said roller *f*², for making up for a decrease of tension in the band *z*. This latter may be kept moist in any suitable manner.

The writing to be copied is placed onto the copying-roller *b*, and the copying is effected by turning axle *c*³, so as to move the moistened copying-paper in the direction of the arrows, and to wind it then up on the receiving roller *c*. The paper *i* is kept in a certain degree of tension first by the resistance of the band *z* against the rotation of roller *a*, and, further, by an elastic piece *b*¹, fixed to an arm or lever

l, which may be pressed against roller *b*, or against the papers on the latter respectively, by screws *f*¹. Thus, on account of the moisture of the copying-paper, and of the pressure, under which it is drawn over the copying-roller, the copies of the original letter or other writing or document are produced in known manner and are produced continuously as long as the turning of roller *c* is continued. The paper *i* with its finished copies, which has been wound up now on said roller *c*, is prevented from spontaneous unrolling by a flat spring *d*, the tension of which may be regulated by screw *f*². The paper need be cut now into single sheets, for which purpose a cutting-device is arranged between the rollers *b* and *c*. Said device consists of a table *g*, to the front of which is attached an immovable knife *f* and a movable knife *e*, which latter is pivoted at *m*. The operation of this device will be clear without further explanation.

We wish it to be understood, that roller *c* is not indispensably requisite, but that we may dispense with it, and lead the paper from roller *b* directly to the cutting-device last described. Therefore,

What we claim, and desire to secure by Letters Patent, is—

1. In a copygraph, the combination with roller *a* holding the copying-paper, and with roller *b* holding the writing to be copied, of band *z* adapted to moisten the copying paper, and of press-piece *b*¹ adapted to press said paper onto roller *b*, for the purpose as described.

2. In a copygraph, the combination with roller *a* holding the copying-paper, and with roller *b* holding the writing to be copied, of an endless band *z* adapted to moisten the paper on roller *a*, and of press-piece *b*¹ adapted to press said paper onto roller *b*, for the purpose as described.

3. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, of an endless band *z*, adapted to moisten the paper on roller *a*, and of press-piece *b*¹ adapted to press said paper onto roller *b*, said press-piece being attached to an adjustable arm *l*, for the purpose as described.

4. In a copygraph, the combination with roller *a* holding the copying-paper, and with

5 In a copygraph, the combination with roller *a*, holding the copying paper, and with roller *b* holding the writing to be copied, of
10 an endless band *z*, held by adjustable rollers *z'* *z''*, and adapted to moisten the paper on roller *a*, and of press-piece *b'* attached to an arm *l* adjustable by screw *f'*, and adapted to
15 press said paper onto roller *b*, for the purpose as described.

7. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of an endless band *z* adapted to moisten the paper on roller *a* and of press-piece *b'* adapted to press said paper onto roller *b*, for the purpose as described.

8. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of an endless band *z* adapted to moisten the paper on roller *a*, and of press-piece *b'* adapted to press said paper onto roller *b*, said press-piece being attached to an adjustable arm *l*, for the purpose as described.

9. In a copygraph, the combination with roller *a* holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of an endless band *z* held by rollers *z'* *z*², of adapted to moisten the paper on roller *a*, and of press-piece *b'*, attached to an adjustable arm *l*, and adapted to press said paper onto roller *b*, for the purpose as described.

10. In a copygraph, the combination with
50 roller *a* holding the copying-paper, and with
roller *b* holding the writing to be copied, and
with roller *c* receiving the finished copies, of
an endless band *z*, held by adjustable rollers
z' *z''* and adapted to moisten the paper on roller
55 *a*, and of press-piece *b'* attached to an arm *l*
adjustable by screw *f'*, and adapted to press
said paper onto roller *b*, for the purpose as
described.

11. In a copygraph, the combination with
60 roller *a* holding the copying-paper, and with
roller *b* holding the writing to be copied, of a
band *z* adapted to moisten the copying paper,
and of press-piece *b'* adapted to press said pa-
per onto roller *b*, the knives *e f* adapted to
65 cut the finished copies, for the purpose as de-
scribed.

roller *a* holding the copying paper, and with roller *b* holding the writing to be copied, of an endless band *z* adapted to moisten the paper on roller *a*, and of press-piece *b'* adapted to press said paper onto roller *b*, the knives *e* adapted to cut the finished copies, for the purpose as described.

13. In a copygraph, the combination with roller *a*, holding the copying-paper and with roller *b* holding the writing to be copied, of an endless band *z* adapted to moisten the paper on roller *a* and of press-piece *b'* adapted to press said paper onto roller *b*, said press-piece being attached to an adjustable arm *l*, the knives *e f* adapted to cut the finished copies, for the purpose as described.

14. In a copygraph, the combination with roller *a* holding the copying-paper, and with roller *b* holding the writing to be copied, of an endless band *z* held by rollers *z'* *z*², and adapted to moisten the paper on roller *a*, and of press-piece *b'*, attached to an adjustable arm *l*, and adapted to press said paper onto roller *b*, the knives *e f* adapted to cut the finished copies, for the purpose as described.

15. In a copygraph, the combination with roller *a*, holding the copying-paper and with roller *b* holding the writing to be copied, of an endless band *z*, held by adjustable rollers *z'* *z''*, and adapted to moisten the paper on roller *a*, and of press-piece *b'* attached to an arm *l* adjustable by screw *f'*, and adapted to press said paper onto roller *b*, the knives *e f* adapted to cut the finished copies, for the purpose as described.

16. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of band *z* adapted to moisten the copying-paper, and of press-piece *b'* adapted to press said paper onto roller *b*, the knives *e f* adapted to cut the finished copies, for the purpose as described.

17. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of an endless band *z* adapted to moisten the paper on roller *a* and of press-piece *b'* adapted to press said paper onto roller *b*, the knives *e f* adapted to cut the finished copies, for the purpose as described.

18. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of an endless band *z* adapted to moisten the paper on roller *a*, and of press-piece *b'* adapted to press said paper onto roller *b*, said press-piece being attached to an adjustable arm *l*, the knives *ef* adapted to cut the finished copies, for the purpose as described. 125 130

19. In a copygraph, the combination with roller *a*, holding the copying-paper, and with roller *b* holding the writing to be copied, and with roller *c* receiving the finished copies, of

an endless band z held by rollers z' z'' and adapted to moisten the paper on roller a , and of press-piece b' , attached to an adjustable arm l , and adapted to press said paper onto roller b , the knives e f adapted to cut the finished copies, for the purpose as described.

20. In a copygraph, the combination with roller a holding the copying-paper, and with roller b holding the writing to be copied, and with roller c receiving the finished copies, of an endless band z , held by adjustable rollers z' z'' and adapted to moisten the paper on roller a , and of press-piece b' attached to an

arm l adjustable by screw f' , and adapted to press said paper onto roller b , the knives e f adapted to cut the finished copies, for the purpose as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

HERMANN HURWITZ.
AISIK SCHAPIRO.

Witnesses:

W. HAUPT,
ZSEBUKK.