No. 883,214. PATENTED MAR. 31, 1908.

C. DE LUKACSEVICS.

BLUE PRINTING DEVICE.

APPLICATION FILED JULY 5, 1907.

2 SHEETS—SHEET 1.

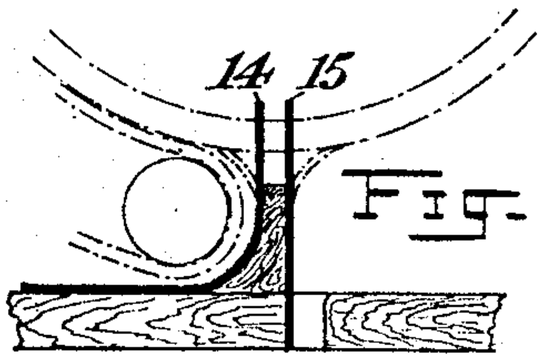

Fig. 4

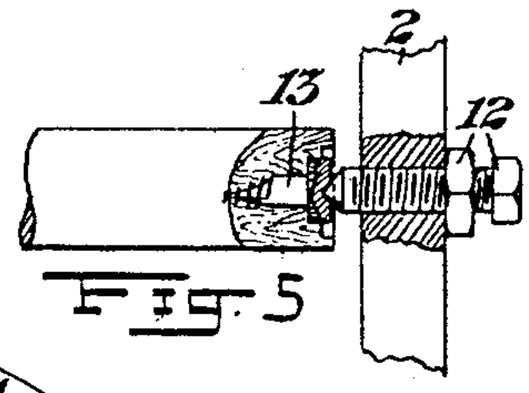

Fig. 5

Fig. 1

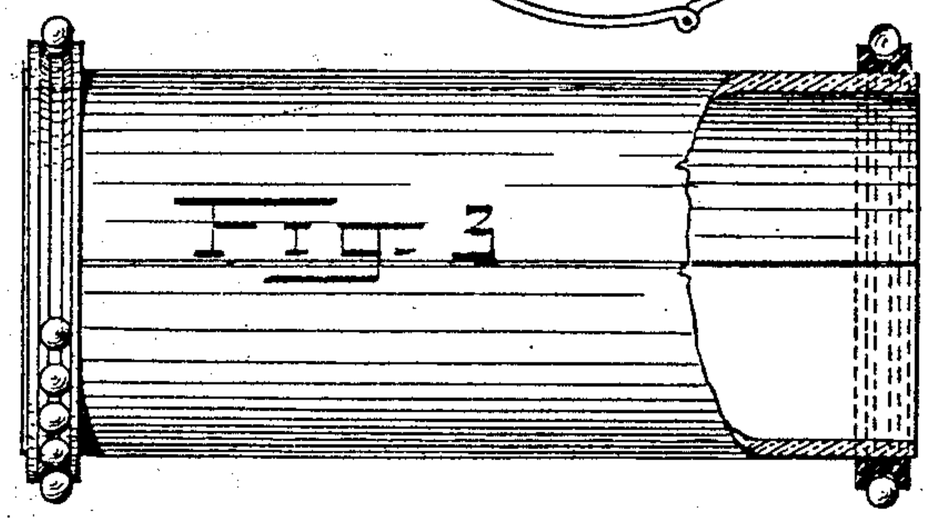

Fig. 3

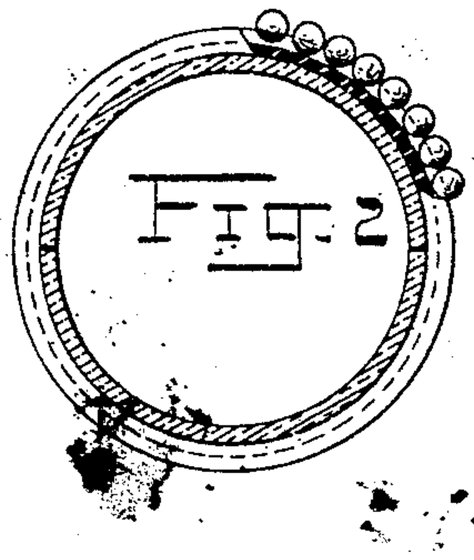

Fig. 2

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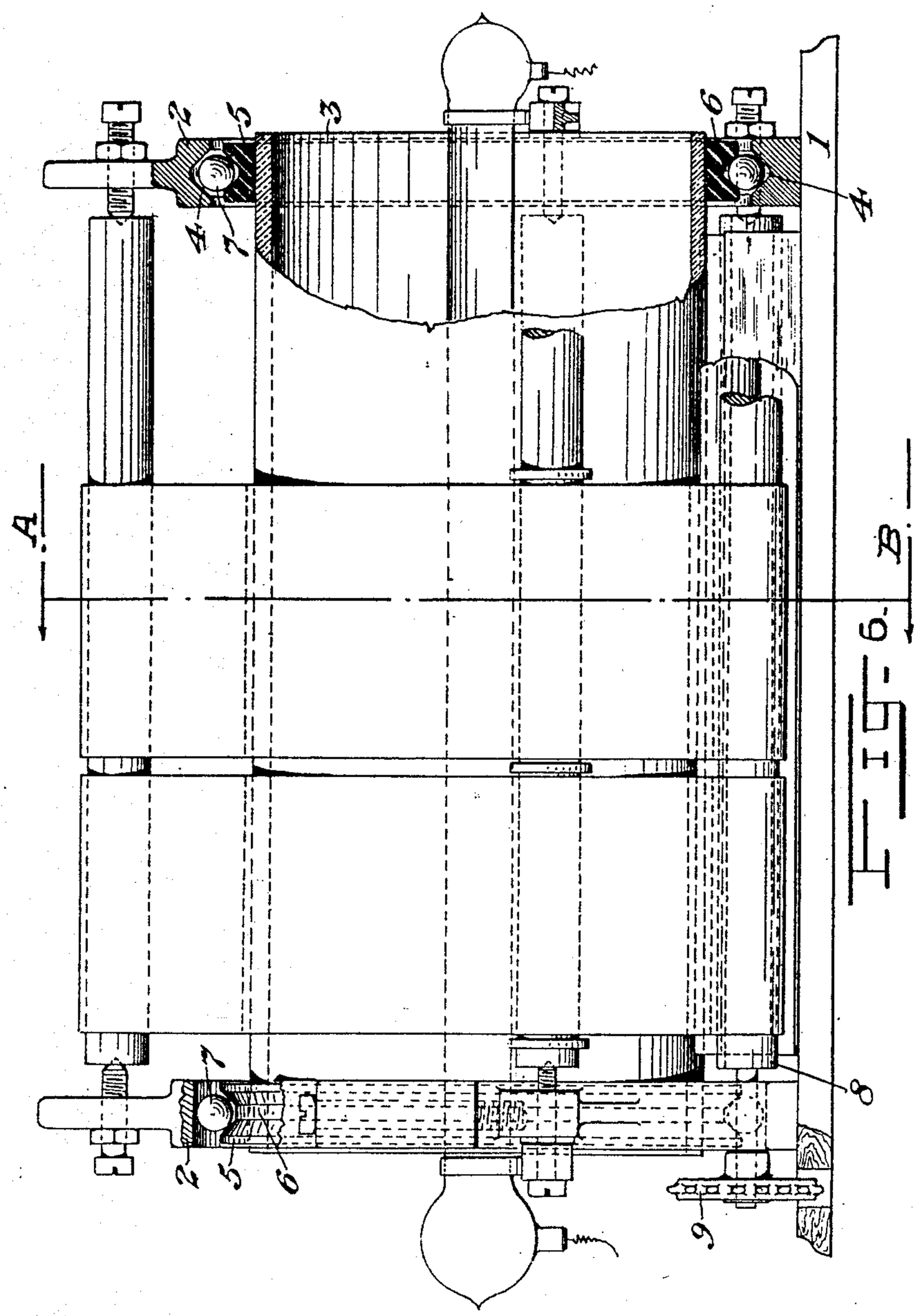

Witnesses
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Inventor
Charles de Lukacsevics
By his Attorney
George H. Strong

Kragenhirst, 120,862, Feb. 17, 1903 (95-77.5)
McAdam, 730,553, June 9, 1903 "

UNITED STATES PATENT OFFICE.

CHARLES DE LUKACSEVICS, OF NEW YORK, N. Y.

BLUE-PRINTING DEVICE.

No. 883,214. Specification of Letters Patent. Patented March 31, 1908.

Application filed July 5, 1907. Serial No. 382,170.

To all whom it may concern:

Be it known that I, CHARLES DE LUKACSEVICS, a citizen of the United States, and resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Blue-Printing Devices, of which the following is a specification.

My invention relates to devices adapted for making blue prints or similar copies from original sketches and drawings or from negatives photographically developed.

In carrying out my invention I make use of a cylinder of glass together with sources of light inside the cylinder. I prefer to use as the sources of light lamps of the Cooper Hewitt type wherein there is a large surface of illumination and a long light column. Such lamps are particularly adapted for use in connection with cylindrical light transmitting devices whereon the negatives, sketches or drawings are carried for printing on a traveling impression sheet. I do not, however, desire to limit myself to the use of the mercury vapor lamp, as the principle of the invention may be embodied in apparatus with which other sources of light are used.

The cylinder which I use may be made up of two or more parts, the edges of which are ground smooth and pressed against each other so as to form a very close joint. I find that under the conditions present in the operation of my invention the joints do not show on the prints, having determined this by repeated experiment.

I am aware that cylindrical light transmitting bodies have been used in this art, but always with a loss of considerable printing effect, owing to the fact that the printing is done upon only a certain portion of the cylinder, a considerable part thereof being so arranged with respect to the traveling print and transparencies as to be ineffective in the operation of printing.

One of the advantages of my invention is that I so arrange the prints and transparencies upon the cylinder as to utilize the effect of the light during the travel of these devices over practically the entire surface of the cylinder.

Another feature of my invention resides in the use of a grooved band or ring surrounding each end of the cylinder, the groove in the band at one end of the cylinder corresponding to a groove in the frame of the apparatus to form a runway for steel balls whereby the cylinder is moved with comparatively little friction by the apron which surrounds it and which is frictionally operated by a suitable source of power. The surrounding ring or band is preferably of rubber and the limits of the runway are made such as to allow for the expansion of the cylinder when the same becomes heated by the operation of the lamps so that there shall at no time be any binding friction in the movement of the cylinder. The groove in the band or ring at the opposite end of the cylinder also constitutes a runway for balls, but there is no corresponding groove in the frame, this arrangement being adopted in order to permit longitudinal movement or expansion of the cylinder within small limits so as to do away with the possibility of unnecessary friction at this point, also.

A third feature of my invention resides in the employment of smooth guides, preferably curved at the ends where they touch the cylinder, one of said guides serving to direct the printing paper and transparencies where they enter the circuit surrounding the cylinder, and the other serving to guide the issuing print and transparencies to a proper exit or receptacle. By arranging these guides close together, preferably near the bottom of the cylinder, I make it possible to utilize practically all the surface of the cylinder during the actual printing operation, the unused space being merely that which lies between the outer surface of the guides where they touch the cylinder.

These and other details of the invention will be understood by reference to the accompanying drawings, in which

Figure 1 is a transverse section of my blue printing machine, taken on the line A—B in Fig. 6; Fig. 2 is a reduced transverse section of the cylinder; Fig. 3 is a reduced side view of the cylinder showing one end thereof in section; Fig. 4 is a detail view illustrating guides; Fig. 5 is a detail of the end connections of one of the shafts of the device; and Fig. 6 is a side elevation of the apparatus, partly sectional at one end.

Referring to the drawings, 1 is a suitable base on which is supported a frame, 2, 2. The parts 2, 2 consist mainly of skeleton supports having large circular openings within

Rush, 834,490, Oct. 30, 1906 (95-77.5)

which the cylinder, 3, preferably of heavy plate glass, is supported. That part of the frame which is shown at the right in Fig. 6 is grooved at 4 as shown, while the left hand portion of the frame presents internally a smooth unbroken surface. The cylinder itself is surrounded at each end by a band or ring, 5, preferably of rubber, and each of said bands is grooved at 6, as clearly shown in Figs. 3 and 6. Between the interior surface of the frame and the exterior surface of the rings are arranged anti-friction balls, 7, 7, which, at the right hand end of the machine as shown in Fig. 6, run in a way bounded by the walls of the grooves 4 and 6. It will be seen that, while the ball shown at the lower side of this figure at the right is firmly compressed between the band and the frame, the ball shown at the upper part of the figure does not touch the interior wall of the frame. This represents the non-operating position of the parts, the object of leaving this play between the balls and the interior wall of the frame being to allow for the expansion of the cylinder and the parts connected therewith under the influence of the heat developed in the lamp or lamps during the printing operation.

The balls at the left in Fig. 6 being adapted to rest within the groove 6 on one side and not being held in any similar groove on the interior of the frame 2 are free to have some small longitudinal movement due either to the expansion of the cylinder or to irregularities in the structure thereof.

It being very difficult to construct a perfect cylinder of glass, I have adopted in some instances the use of a cylinder made up of several parts. In the present instance I have shown in Figs. 1, 2 and 3, a two-part cylinder, although it will be understood that the number of parts may be increased at will and also that, if preferred, a cylinder in one piece may be used. That is to say, so far as certain features, of the present invention are concerned, it makes no difference whether the cylinder is one entire cylinder or is made up of two or more parts.

The driving shaft for the mechanism thus far described is shown at 8, on the reduced end of which shaft a driving sprocket wheel, 9, is illustrated. On different parts of the frame are supported idlers, 10, 10, which serve to carry, support and put under tension an endless apron, 11, one part of which fits tightly around the cylinder and carries the cylinder with it when the apron is moved by the operation of the driving shaft. As a matter of fact, I may and generally do provide a series of these aprons, as indicated in Fig. 6 where two are shown and where space is left for a third apron, not shown. These idler shafts as well as the remote end of the driving shaft are preferably supported by means such as are illustrated in Fig. 5. Here a set screw, 12, passing through the frame 2 engages at its inner pointed end with the end of a bearing screw, 13, provided with a notch or indentation corresponding to the point on said screw 12. This makes a well known anti-friction bearing and constitutes no part of the present invention.

Before describing the operation as a whole, it remains to describe the guides already referred to, such guides being shown at 14 and 15 in Figs. 1 and 4. These guides are generally made of some smooth yielding substance, such as celluloid, and before the cylinder is put in place they occupy the position illustrated in Fig. 4. The insertion of the cylinder depresses the ends of the guide pieces and brings them into the position illustrated in Fig. 1. The guide 14 is located, as clearly shown in the drawings, just outside that portion of the apron 11 which surrounds the driving shaft 8, space being left, however, for the insertion of one or more transparencies and one or more printing sheets, as will be clearly understood. The rotation of the driving shaft is in such a direction as to carry these sheets and transparencies upward between the apron and the cylinder, it being understood that the arrangement of the sheets and transparencies so as to bring the latter close against the surface of the cylinder while the former is outside and adapted to take the imprint from the transparencies when the lamps are lighted.

The guide 15 surrounds a portion of the apron which travels upon the idler shaft 10 which is most remote from the driving shaft in the circuit of the apron, although actually nearest in space. The printing sheets and transparencies striking against this guide at the completion of the printing operation are turned downward and pass through an opening, 16, leading to a receptacle, 17, or to any place of deposit for the sheets.

The operation is plain. The lamp or lamps having been lighted, and the driving shaft having been connected with the source of power, materials for carrying out the printing operation are placed upon the smooth surface of the guide 14 outside where it extends along the base 1 and pushed in until by the action of the apron it is caught and carried around the cylinder. Thereupon it travels over practically the entire surface of the cylinder finding its exit through 16 as already described. Meanwhile, the several sheets have been exposed during the entire circuit to the influence of the light passing through the transparencies and no space which it was possible to utilize has been wasted. By this arrangement of devices it is possible to utilize with the same effect as compared with blue printing devices in which only a comparatively small portion of the surface of the cylinder is utilized, a smaller cylinder; or with a cylinder of the same size,

better effects can be produced or possibly inferior sources of light or a smaller expenditure of energy for producing the light.

I claim as my invention:—

1. In a blue-printing machine, a light-transmitting cylinder composed of a plurality of parts, the edges of which are ground and fitted closely together.

2. In a blue-printing machine, a light-transmitting cylinder composed of a plurality of parts, the adjacent edges of which are fitted closely together in substantial contact, so as to form a smooth, unbroken surface.

3. In a blue-printing machine, a light-transmitting cylinder, a source of light therein, means for causing said cylinder to rotate, rings or bands of elastic, yielding material, surrounding the said cylinder, and ball bearings between said rings or bands and their supports.

4. In a blue-printing machine, a light-transmitting cylinder, a source of light therein, means for causing said cylinder to rotate, rings or bands surrounding the said cylinder, a frame supporting the same and provided with circular openings, and ball bearings between the said rings or bands and the frame, the ring or band at one end of said cylinder being capable of longitudinal movement relative to said frame.

5. In a blue-printing machine, a light-transmitting cylinder, a source of light therein, means for causing said cylinder to rotate, rings or bands surrounding the said cylinder, a frame supporting the same and provided with circular openings, and ball bearings between the said rings or bands and the frame, both of said rings or bands being grooved to receive the balls, and the frame being similarly grooved at one end only.

6. In a blue-printing machine, a rotating cylinder for carrying the materials for printing, and fixed, resilient guides located adjacent to each other for directing the materials into and out of engagement with the cylinder.

7. In a blue-printing machine, a rotating cylinder for carrying the materials for printing, and curved resilient guides bearing against the surface of the cylinder, one for directing the materials for printing into engagement with the cylinder, and the other for directing the said materials out of engagement therewith.

8. In a blue-printing machine, the combination with a rotating cylinder for carrying the materials for printing, of a pair of guides consisting of thin, resilient sheets secured to the frame of the machine, adjacent each other, and, when free, projecting substantially parallel, but normally deflected in opposite directions by said cylinder, against the surface of which they bear at their free edges.

Signed at New York, in the county of New York, and State of New York, this 3rd day of July, A. D. 1907.

CHARLES DE LUKACSEVICS.

Witnesses:
THOS. H. BROWN,
GEORGE H. STOCKBRIDGE.