(No Model.)

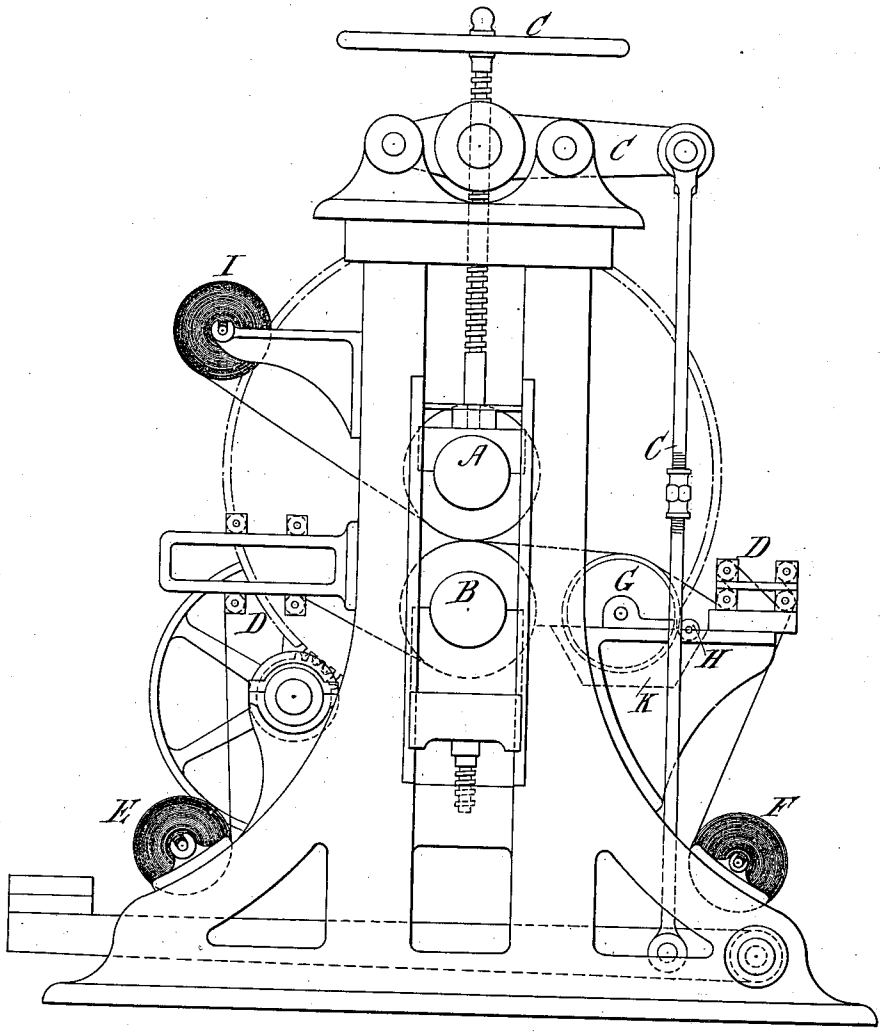
2 Sheets—Sheet 1.

S. BARLOW.

MANUFACTURE OF COMPOUND FABRIC FOR BOOK BINDING.

No. 332,778. Patented Dec. 22, 1885.

Fig. 1.



Witnesses:
George T. Curtis Jr.
Albert Carpenter

Inventor:
Samuel Barlow
by Curtis & Crocker
attys.

(No Model.)

2 Sheets—Sheet 2.

S. BARLOW.

MANUFACTURE OF COMPOUND FABRIC FOR BOOK BINDING.

No. 332,778. Patented Dec. 22, 1885.

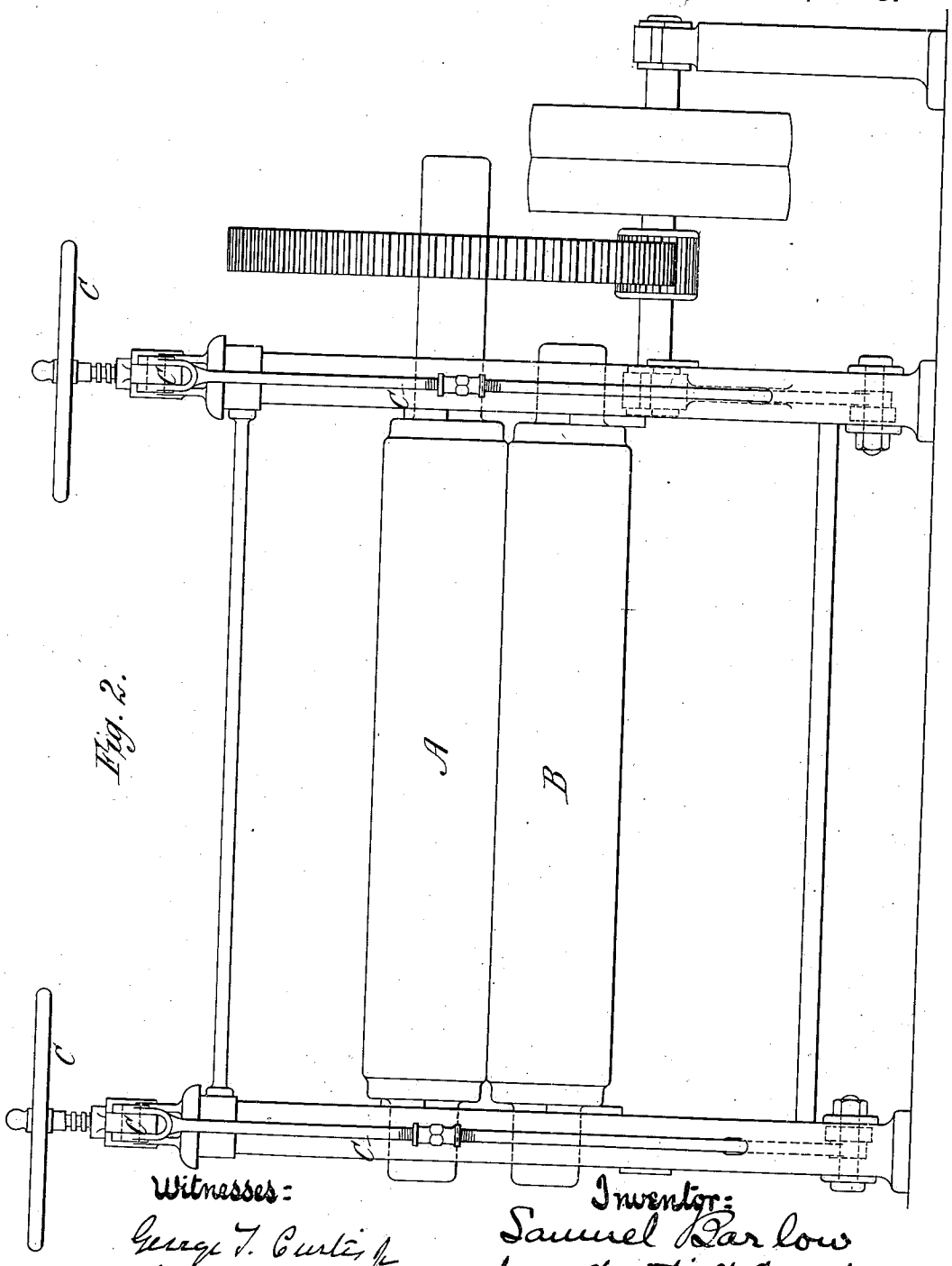


Fig. 2.

Witnesses:
George T. Curtis, Jr.
Wm Carpenter.

Inventor:
Samuel Barlow
by Curtis & Crocker
Attys.

UNITED STATES PATENT OFFICE.

SAMUEL BARLOW, OF CASTLETON, NEAR MANCHESTER, ENGLAND.

MANUFACTURE OF COMPOUND FABRIC FOR BOOK-BINDING.

SPECIFICATION forming part of Letters Patent No. 332,778, dated December 22, 1885.

Application filed April 29, 1885. Serial No. 163,801. (No model.) Patented in England July 3, 1884, No. 9,723.

To all whom it may concern:

Be it known that I, SAMUEL BARLOW, a subject of the Queen of Great Britain and Ireland, residing at Castleton, near Manchester, Kingdom of Great Britain and Ireland, have invented certain new and useful Improvements in the Manufacture by Machinery of a Compound Material Comprising Paper and Cloth for Book-Binding and other Purposes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

In the manufacture of a compound material comprising paper and cloth united or fastened together by adhesive substance and intended for use in book-binding and for other purposes, after paste has been applied to the cloth or paper, or both, the two materials (cloth and paper) with interposed paste have been passed between hard rollers, which heretofore have been of a like or similar kind, such as a pair of metal or wooden rollers working together, the object being to unite by pressure the paper and cloth, so as to form a compound material to be afterward dried preparatory to use.

Rollers of the rigid, inflexible, and non-yielding character above referred to, however, do not perfectly unite the paper and cloth, and with the means heretofore used it has not been practicable to produce on a commercial scale compound material of uniform quality by combining or uniting paper and cloth as and for the purposes mentioned.

Now I have discovered that the combining or uniting operation may be effectually performed and uniformity of material obtained as follows:

According to my invention, I use in the combining or uniting machine rollers of a dissimilar kind—that is, with rigid and with elastic or resilient surfaces, as, for example, a roller (or rollers) of any suitable hard metal or material—such as brass, copper, iron, or steel, or hard wood—and a roller (or rollers) of any suitable material relatively elastic or resilient—such as india-rubber—or of metal or other material coated or covered with india-rubber or gutta-percha, or cotton, or paper.

It is to be understood that each pair of rollers between which the paper and cloth, with interposed adhesive substance, are to be passed is according to my invention to consist of a roller with a hard or rigid operating-surface and a roller with a relatively elastic or resilient operating-surface, as above described, and that the material under treatment may be passed through more than one set of rollers to insure the perfect combination or fastening together of the cloth and paper.

In the accompanying sheet of illustrative drawings, Figure 1 is an end view, and Fig. 2 a front view, of a combining-machine for carrying out my invention.

The machine comprises a pair of ordinary mangle or calender sides or frames, in which are mounted two bowls or rollers, A B. One of these bowls or rollers, say A, is formed of suitable material—such, for example, as metal—and coated or covered with an elastic or resilient substance—such as india-rubber—to give the necessary elasticity to its surface. The other bowl or roller, B, is formed of hard material—such as iron, brass, copper, or other metal or substance of a rigid and non-elastic character. The sides or frames of the machine are furnished with screws and compound levers C C C C, through which latter the roller A is loaded in a well-known manner, so that the necessary pressure is brought to bear upon the material passing between the rollers A and B.

D D are tension or straining bars, over and under which the respective rolls of paper and cloth are passed, and are thereby kept tight and level, creasing being thus prevented in the combined material.

E is a roll of paper, or other substance to be used in lieu of paper, and F is a roll of cloth. This roll of cloth may be of cotton, linen, woolen, silk, or other fibrous material, and may be in the ordinary gray state, as manufactured, or be bleached, or dyed, or padded with pin-rollers by an ordinary printing-machine of a uniform color; or the surface of the cloth may be varied by suitable patterns printed upon a dyed, padded, or white ground by an ordinary printing-machine. The roll of cloth may be then stiffened or filled to a suitable degree by a stiffening material—such as starch or gum—applied to the cloth by an or-

dinary stiffening mangle or back starcher in a well-known manner, the cloth being afterward dried by passing it over an ordinary steam-cylinder drying-machine, or by any other convenient drying process. The stiffened and dried cloth is afterward wound upon a roller and taken to the combining-machine to be united to the roll E of paper or other material.

G is a furnishing-roller arranged to revolve in a trough, K, which is partially filled with adhesive substance, such as starch or gum.

H is a small roller working in contact with the furnishing-roller G by pressure therewith. It serves to regulate the quantity of starch, gum, or other adhesive substance necessary to be applied to the cloth for the purpose of attaching or combining it to the paper or other substance.

The method of combining the two materials is as follows: The roll E, of paper or other substance, is mounted on one side of the machine, and the roll F, of cloth, on the other side thereof, as shown in Fig. 1. When the machine is set in motion, the material forming each roll will pass over or both over and under its respective tension or straining bars D, as shown. The cloth forming the roll F passes over and in contact with the furnishing-roller G, whereby it is supplied with the requisite quantity of adhesive material, and, meeting the paper or other material from the roll E between the bowls or rollers A and B, becomes, by the pressure thereof due to the action of the screws and compound levers and the weight of the roller A, firmly attached or united therewith. The combined material as it issues from the machine is wound upon a roller, I. The combined material may be then dried by passing it over a steam-cylinder drying-machine, or by any other convenient drying process. It may be afterward calendered, or calendered and embossed, or be finished in any other known method, as may be desired.

I am aware it has before been proposed to combine paper and cloth by pressure; but the means employed have not been such as to produce a satisfactory result on a commercial scale.

I am aware that the patent to Inman, No. 24,369, describes two rolls—one with an elastic and the other with a hard surface—between which a web of paper is passed; but this is essentially different from my invention, because in Inman's process the elastic and hard rolls are employed to coat the web of paper uniformly with the paste or other adhesive material, and have nothing to do with the operation of uniting the two webs or sheets of material, whereas I employ an elastic and a hard roll to press the two sheets together and insure their being perfectly united at every point.

I am also aware that the patent to Bancroft, No. 255,129, describes a machine for waxing paper in which are employed two rolls—one with an elastic and one with a hard surface; but in his machine the rolls are employed to press the wax into the paper and to remove the superfluous wax, and are not employed to unite two webs or sheets.

I am also aware that the patent to Dickerman, No. 124,258, describes rolls employed to unite pasteboard and paper; but his process is essentially different from mine, because in the apparatus employed by Dickerman both rolls are elastic, and are not capable of producing a good product, whereas in my process I employ only one elastic or yielding roll, and the other roll has a hard or rigid surface.

In combining cloth and paper I have found that the use of two metal or other rigid rollers, or the use of two elastic rollers working in contact with each other in the combining-machine, are about equally impracticable in producing a perfect combination of the cloth and paper. The two metal or rigid rollers, being deficient in elasticity, "grind," as it were, the cloth and paper, and do not permit a sufficient amount of paste or gum to intervene and secure a perfect combination of the two substances. When two elastic rollers are used, the results are even worse in some respects. There being too much elasticity, it is almost impossible to use pressure sufficient to effect a combination of the cloth and the paper without forcing the paste through the interstices of the cloth onto the surface of the combined material or fabric.

It will be found that if enough pressure be used to combine the cloth and paper properly, enough has been applied to spoil the combined fabric, the paste being forced through the cloth and appearing on the surface, making the fabric worthless.

My process, in which a metal roller works in contact with any elastic roller, is a perfect success, and I have made over one hundred thousand yards of combined material by this process, and have not found the combination imperfect in any way.

I have found that the use of two rollers of like character, either rigid or elastic, in the combining-machine produces nothing but failure, while the use of one rigid and one elastic roller in the same machine produces a valuable product with such certainty as to make it a commercial success.

What I claim is—

The process of making compound material for book-binding and other purposes, consisting in combining sheets or webs of paper, cloth, or other material by pressing together such sheets or webs with interposed adhesive material between two rolls, one roll having a rigid and the other roll an elastic or resilient surface, substantially as described.

SAMUEL BARLOW.

Witnesses:

GEO. W. BROWN,

W. WARDLE,

Clerks with E. Butler Rowley, Notary Public, Manchester.