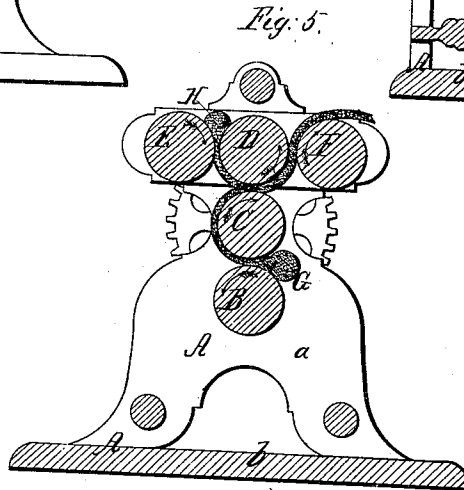
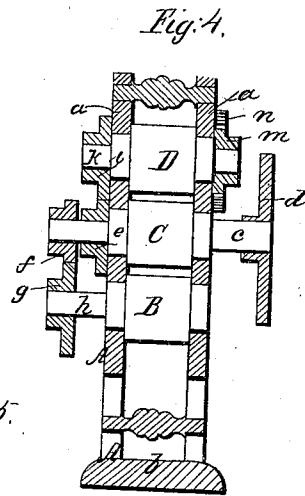
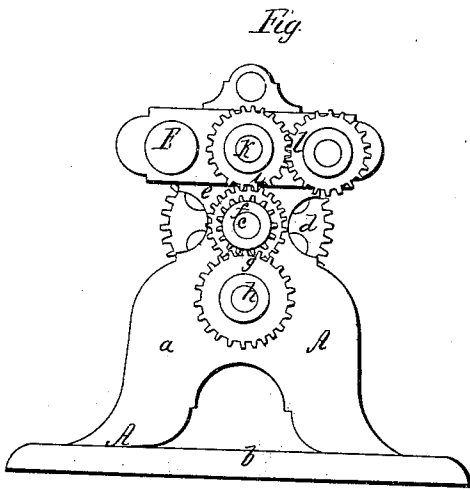
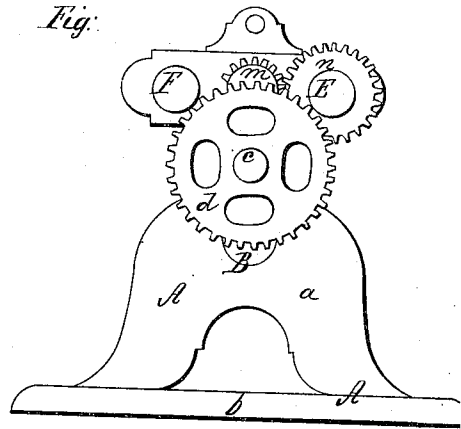
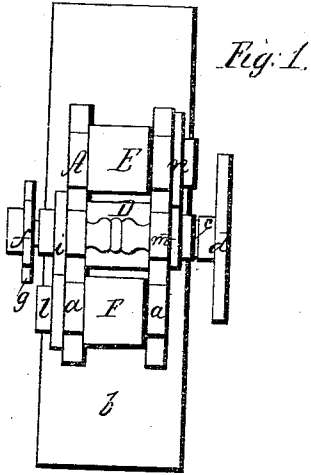


D. C. HULL.
 ROLLING RUBBER INTO SHEETS AND APPLYING THE SAME TO FABRICS
 No. 68,365. Patented Sept. 3, 1867.



Witnesses;
L. J. Miller.
W. H. Andrews.

Inventor;
David C. Hull.
by his attorney
R. H. Lee,

United States Patent Office.

DAVID C. HULL, OF CHELSEA, MASSACHUSETTS.

Letters Patent No. 68,365, dated September 3, 1867.

IMPROVEMENT IN ROLLING RUBBER INTO SHEETS AND IN APPLYING THE SAME TO FABRICS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, DAVID C. HULL, of Chelsea, in the county of Suffolk, and State of Massachusetts, have made a new and useful invention having reference to Rolling India Rubber into Sheets, and converting it into a single sheet, or applying such a sheet to cloth or other sheet material; and I do hereby declare the said invention to be described in the following specification, and the means by which it is to be accomplished to be represented in the accompanying drawings, of which—

Figure 1 is a top view,

Figures 2 and 3 are front and rear elevations,

Figure 4 a transverse section, and

Figure 5 a longitudinal section of the machine employed for such purpose.

In such drawings, A denotes the frame of the machine as composed of two standards, *a a*, and a base-plate, *b*, the said standards being erected on such base-plate perpendicularly thereto, and parallel to each other. Within this frame are three rollers, B C D. The roller C is directly over the roller B, and between it and the roller D. Furthermore, there are two other rollers, E and F, which are arranged within the frame A, and on opposite sides of the upper roller D, in manner as represented. On the shaft *c* of the roller C is a driving-gear, *d*, and two other gears, *e f*, the gear *f* having a diameter less than that of the gear *e*, and being made to engage with a gear, *g*, which is larger in diameter than the gear *e*, and is fixed on the shaft *h* of the lower roller B. Furthermore, the gear *e* engages with another gear, *i*, of the same size, and fixed on the shaft *k* of the upper roller D. The gear *i* engages with the gear *l*, fixed on the shaft of the roller F. A pinion, *m*, on the shaft of the roller D, engages with a larger gear, *n*, on the shaft of the roller B.

From the above it will be seen, while the rollers C, D, and F revolve at equal speeds, the roller B will be revolved slower than the roller C, and the roller E will be revolved slower than the roller D, the speeds of the two rollers B and E being alike. Now, if we place a mass of rubber, G, between the rollers B and C, and another mass, H, of such rubber above and between the two rollers D E, and put the machine in operation so as to cause the several rollers to be revolved in the directions of the arrows marked thereon, we shall find that one of such masses will be ground between the rollers B C, and the other will be ground between the rollers E and D, and will be carried along the rollers C and D, and between them, and thence between the rollers D and F, by which the two sheets thus formed will be compressed into one single sheet, which will pass upward from such two rollers last mentioned.

In making a sheet of rubber by means of two rollers there are apt to be air-holes or other defects in it, but when the sheet is composed of two sheets so made, and subsequently pressed together, any defects in one will be very likely to be neutralized or covered by the other, and a compound sheet of rubber made by my machine will be a much better article than one made by two rollers alone. By means of the machine a single strip of cloth may be covered with the compound sheet of rubber, or two such pieces of cloth may be run between the rollers, and each piece be coated with rubber, and their coatings be pressed together so as to form one thickness of rubber between the two layers of cloth.

What I claim as my invention is—

The improvement in the manufacture of sheets of rubber by means of rollers, the same consisting in the formation of two separate sheets by two pairs of reducing-rollers, and subsequently bringing together and uniting the two sheets so made, by means of two rollers, and by the pressure of such sheets between such rollers, as specified.

I also claim the new manufacture or compound rubber sheet as made by such process or means.

I also claim the duplex or compound rubber-sheet making machine as composed of the two pairs of reducing-rollers B C and D E, and one or more compressing-rollers F, the whole being to operate substantially as and for the purposes described.

I also claim the above-described improvement in the application of rubber to cloth by means of rollers, the same consisting in the formation of two separate sheets of rubber by two separate sets of reducing-rollers, and applying and pressing, by means of two rollers, such two sheets together, and upon a single piece of cloth, or upon two pieces of cloth, so as to unite the sheets and cloth in manner as specified.

I also claim the new manufacture or compound rubber-coated cloth, or its equivalent, made by means and in the manner specified.

DAVID C. HULL.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.