

No. 753,752.

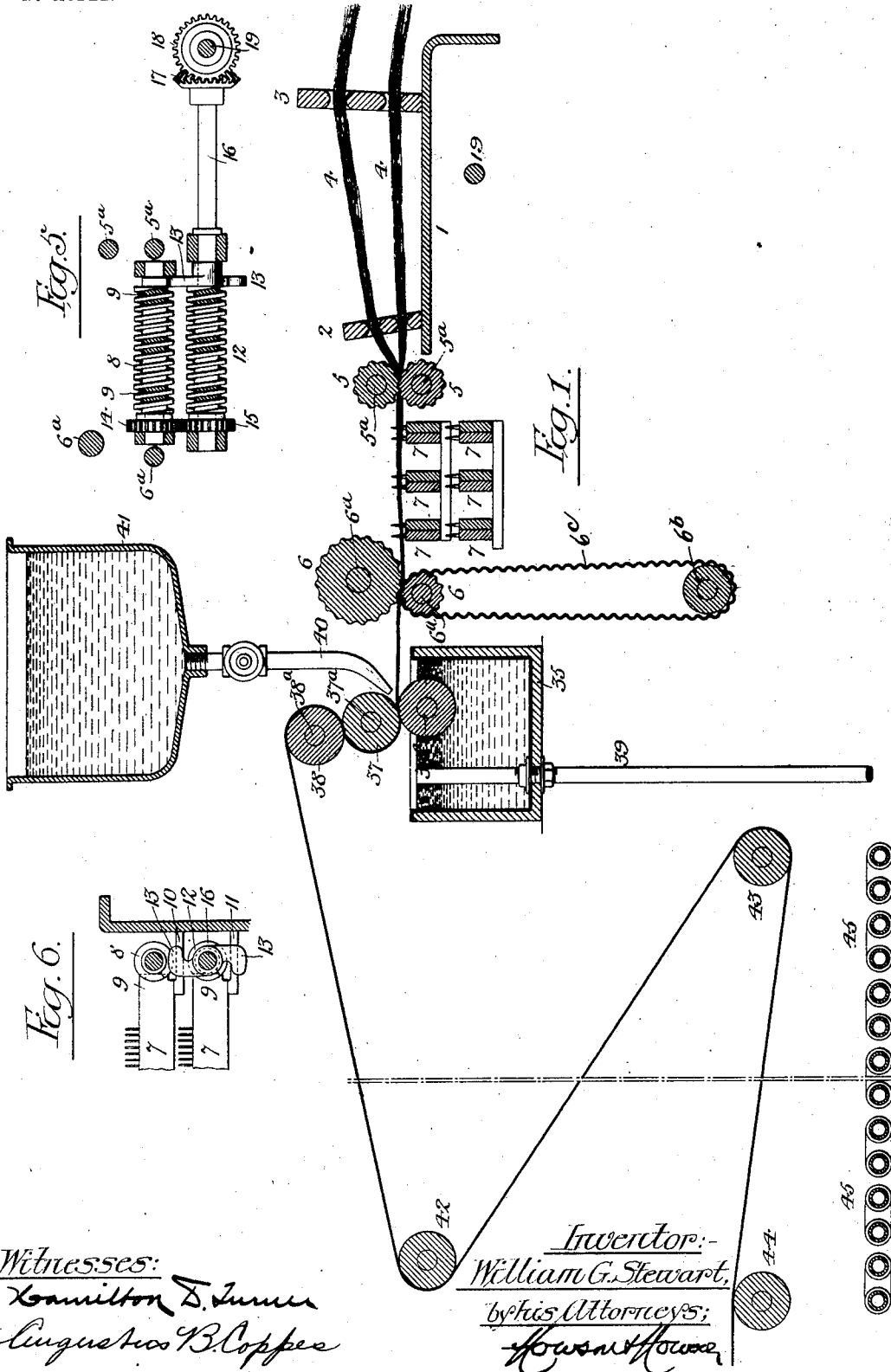
PATENTED MAR. 1, 1904.

W. G. STEWART.
MACHINERY FOR THE PRODUCTION OF TEXTILE WEBS.

APPLICATION FILED JULY 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
Hamilton D. Linn
Augustus B. Cooper

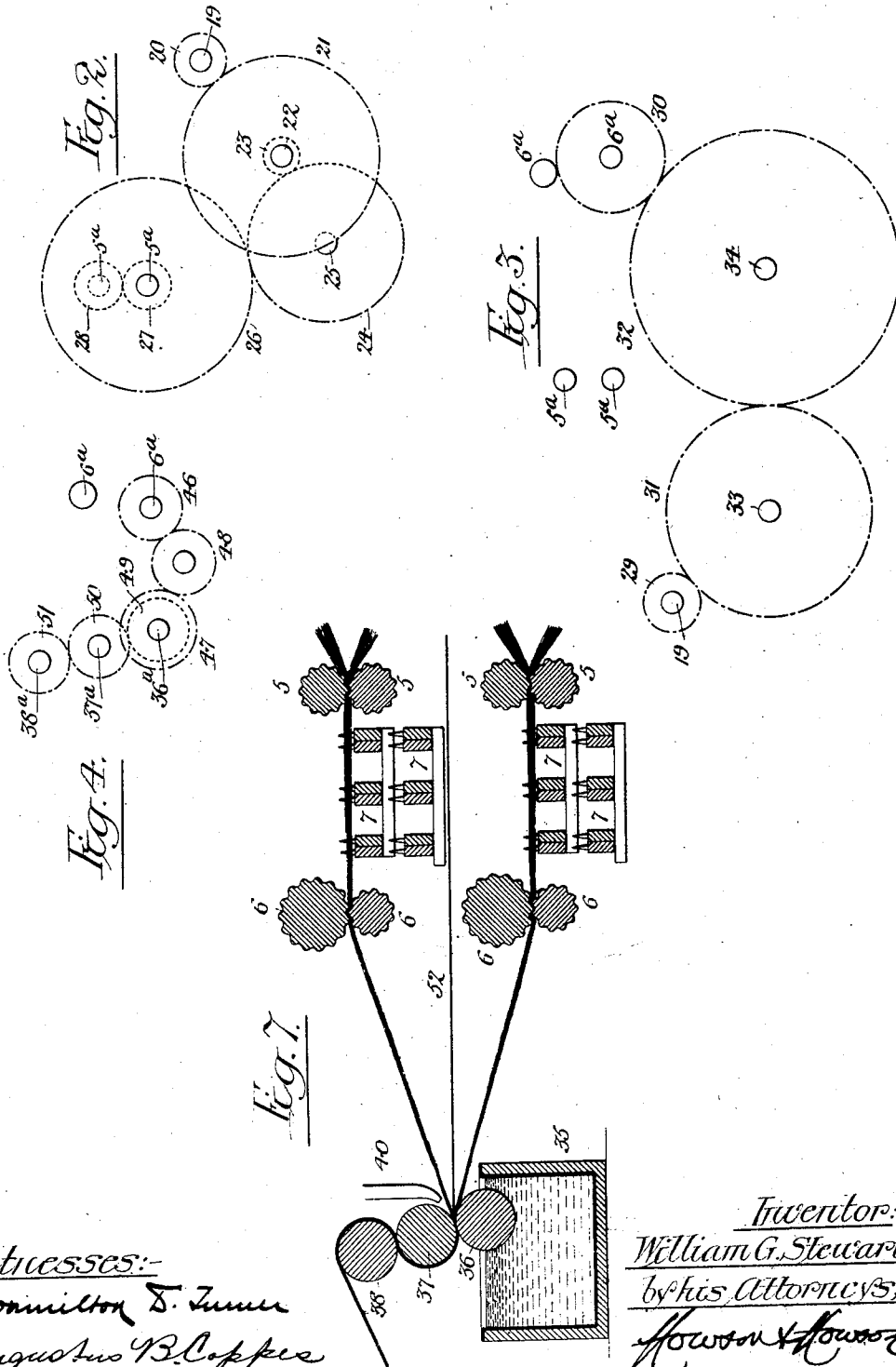
Inventor:
William G. Stewart,
by his Attorneys:
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Hamilton D. Turner
Augustus B. Cooper

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Howe & Howe

UNITED STATES PATENT OFFICE.

WILLIAM G. STEWART, OF PHILADELPHIA, PENNSYLVANIA.

MACHINERY FOR THE PRODUCTION OF TEXTILE WEBS.

SPECIFICATION forming part of Letters Patent No. 753,752, dated March 1, 1904.

Application filed July 27, 1903. Serial No. 167,238. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. STEWART, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
 5 Improvements in Machinery for the Production of Textile Webs, of which the following is a specification.

My invention consists of a machine for making that class of textile webs which are composed of a relatively thin fleece whose fibers are disposed side by side and united by means of glue or other sizing material, my improved machine comprising means for properly disposing the fibers in respect to each other in
 10 order to form the fleece and then cementing said fibers together to form the desired web, the invention also comprising a machine for combining one or more webs of the character described with a backing or lining fabric intended to impart increased stability to the web.

In the accompanying drawings, Figure 1 is a longitudinal section of sufficient of a machine for producing a single web in accordance with my invention to convey a proper understanding of the latter. Fig. 2 is a diagrammatic representation of the gearing whereby the feed-rolls of the fiber-combing device are actuated. Fig. 3 is a similar view representing the gearing whereby the fiber-drawing rolls of the machine are driven. Fig. 4 is a like view illustrating the gearing whereby the sizing-rolls of the machine are driven. Figs. 5 and 6 are views of parts of the mechanism for actuating the traveling comb-bars, and Fig. 7 is a view illustrating means whereby a lined web may be produced in accordance with the invention.

In carrying out my invention fiber in the form of a roving or sliver is subjected to a drawing or combing operation, or, by preference, to a combined drawing and combing operation, whereby it is reduced to the form of a thin flat web or fleece having the fibers properly straightened and laid side by side, this
 40 thin fleece being then saturated with glue or other available sizing material, passed between rollers to express the surplus sizing material therefrom, and then subjected to a drying operation.

50 In a special form of the machine a thin web

or fleece of the character described is backed by a strip of fabric, which is united thereto by the subsequent sizing operation, or a pair of webs or fleeces of the character described are combined with an intermediate strip or
 55 sheet of fabric, and the members of the composite web are then united by the sizing operation, the result in either case being a web which is stronger and better able to resist transverse strain than one in which the lateral
 60 confinement of the fibers of the web or fleece is due to the sizing material alone.

In the drawings, 1 represents a table or platform having projecting guides 2 and 3 for a series of rovings 4, which pass from the guide
 65 2 to and between a pair of feed-rolls 5, and thence forwardly to a pair of draft-rolls 6, the roving in its passage from one pair of rolls to the other being subjected to a combing action by being drawn between the teeth of a series
 70 of traveling comb-bars 7, these comb-bars traveling forwardly with the roving, but at a lesser rate of speed than the draft imparted to the latter by the rolls 6, so that the fibers are combed or straightened and laid side by side
 75 before passing between said rolls 6. A corrugated leather belt 6^a passes around the lower corrugated roll 6 and a guide-roll 6^b, so as to present an extended surface to the fleece passing between the rolls 6. This belt not only
 80 prevents the rapid wear of the lower roll 6, but also, by the relatively elastic support which it affords to the fleece, prevents said fleece from sticking to the lower roll.

In the present instance the comb-bars 7 are
 85 actuated by means of a screw 8, Fig. 5, at each end, each screw engaging with lugs 9, projecting from the comb-bars, which rest upon shelves 10, as shown in Fig. 6, each comb-bar when it reaches the forward limit
 90 of its travel dropping onto a lower shelf 11, so that its lugs 9 come under the influence of a return-screw 12 at each end of the bar, whereby the bars are returned to the starting-point and are then again lifted into en-
 95 gagement with the upper screws by means of tappets 13. The upper and lower screw-shafts are geared together by spur-wheels 14 and 15, so as to rotate at the same speed, and the shaft 16 of the lower screw is driven by
 100

bevel-gears 17 and 18 from the main driving-shaft 19 of the machine, as shown in Fig. 5. The various other rolls of the machine are also driven from this shaft 19 by means of appropriate gearing, that for driving the shafts 5^a of the feed-rolls 5 being shown in Fig. 2 and being as follows: On the shaft 19 is a spur-wheel 20 which meshes with a spur-wheel 21 on a spindle 22, said spur-wheel 21 carrying a pinion 23, which meshes with a spur-wheel 24 on a spindle 25, the spur-wheel 24 meshing with a spur-wheel 26 on the shaft 5^a of the lower roll 5 and said roll being suitably geared to the upper roll by spur-pinions 27 and 28.

The gearing for driving the shaft 6^a of the lower draft-roll 6 is shown in Fig. 3 and comprises a spur-pinion 29 on the shaft 19, said spur-pinion driving a spur-wheel 30 on the shaft of the lower roll 6 through the medium of two intermediate spur-wheels 31 and 32, carried, respectively, by spindles 33 and 34, the relation of the gears for driving said roll 6 in respect to those which drive the rolls 5 being such that said roll 6 will have a much higher surface speed than the rolls 5 in order to effect the desired drawing of the fibers in their passage from one pair of rolls to the other.

In advance of the rolls 6 is a trough or receptacle 35, containing glue or other available sizing material, and partially immersed in the glue in this tank is a roll 36, above which is another roll 37 and above the latter a third roll 38, the proper level of glue or sizing material in the box 35 being maintained by an overflow-pipe 39.

As the thin web or fleece passes from the rolls 6 and between the rolls 36 and 37 it receives a supply of glue or sizing from the roll 36 and at the same time has deposited upon it another supply of glue or size from a valved spout 40, depending from an elevated tank 41, so that the thorough saturation of the web with the glue or size is insured and the sticking of the same to the roll 37, which might result if the web was not thus thoroughly saturated, is prevented. This supplementary spout will not be required if the amount of size carried up by the roll 36 is sufficient to thoroughly saturate the web. The saturated web passes around the front of the roll 37 and between the same and the top roll 38, whereby any surplus sizing carried up by the web from the rolls 36 and 37 is expressed and the web is then directed over rollers 42, 43, and 44 and above a heating-coil 45, so as to be properly dried, or in place of such arrangement of directing-rollers and heating-coil any other desired form of drying apparatus may be employed.

The shafts 36^a, 37^a, and 38^a of the rolls 36, 37, and 38 are driven from the shaft of the lower roll 6^a through the medium of gearing shown in Fig. 4, such gearing comprising a

spur-wheel 46 on the shaft 6^a of said lower roll 6, which spur-wheel drives a spur-wheel 47 on the shaft 36^a of the roll 36 through the medium of an intermediate spur-wheel 48, the shafts of the three rolls 36, 37, and 38 being suitably geared together by spur-pinions 49, 50, and 51.

In the production of a lined fabric sizing mechanism of the character described is employed in connection with two sets of drawing and combing devices, which may be so located in respect to each other that as the two webs are fed to the rolls 36 37 a strengthening-web 52, drawn from any suitably-located roller or other source of supply, may be fed in between said webs, so as to be united thereto as the same pass between the said rolls. In that embodiment of this feature of my invention shown in Fig. 7, the two sets of drawing and combing mechanism are disposed one above the other and the lining-web is drawn between them; but it will be evident that any other disposal of the drawing and combing devices which will permit of such introduction of the lining-web will be within the scope of this part of my invention, or the web 52 may be fed to the pasting-rolls with a single fibrous web only when it is desired to merely apply a fabric backing to the same.

I do not desire to claim the specific construction of fiber combing and drawing mechanism which I have illustrated, as such mechanism is well known in the art under the name of a "gill-box;" but

I claim as my invention and desire to secure by Letters Patent—

1. The combination of fiber-combing mechanism adapted to lay textile fibers side by side with means coöperating therewith for applying sizing to the resultant web in order to unite the fibers of the same into a fabric, substantially as specified.

2. The combination of fiber-drawing mechanism adapted to draw textile fibers into a thin web or fleece with means coöperating therewith for applying sizing to the resultant web in order to unite the fibers of the same into a fabric, substantially as specified.

3. The combination of fiber combing and drawing mechanism arranged to lay textile fibers side by side and form them into a web or fleece with means coöperating therewith for applying sizing to the resultant web in order to unite the fibers of the same into a fabric, substantially as specified.

4. The combination of mechanism for producing a fibrous web or fleece with devices coöperating therewith whereby sizing is applied to both sides of the web delivered by said mechanism thereby uniting the fibers into a fabric, substantially as specified.

5. The combination of mechanism for producing a thin web of fibers laid side by side, and sizing devices therefor coöperating therewith, comprising a pair of rollers one of which

rotates in a body of sizing and adapted to apply sizing to the fibers and unite the same into a fabric, substantially as specified.

5 6. The combination of mechanism for producing a thin web of fibers laid side by side, and sizing devices therefor, comprising a pair of rollers one of which rotates in a body of sizing, and means for applying an independent supply of sizing to the web before it passes
10 between the rollers, substantially as specified.

15 7. The combination of means for producing a thin web of fibers laid side by side, with a sizing device cooperating therewith comprising a set of three rollers one above the other, the lower roller being immersed in sizing, and the web being passed first between said immersed roller and the roller above the same, and then between the latter roller and the top roller, substantially as specified.

8. The combination of means for producing 20 a thin web of fibers laid side by side, with means for applying sizing to said web and for feeding a web of fabric in contact with said fiber web before it reaches said sizing devices, substantially as specified. 25

9. The combination of means for producing a pair of thin webs each composed of fibers laid side by side, means for applying sizing to said webs, and means for feeding a third web between said fiber webs before they reach 30 said sizing devices, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM G. STEWART.

Witnesses:

F. E. BECHTOLD,
JOS. H. KLEIN.